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IT is our aim, our ambition, our aspiration even, to build our Journal worthily and well, not for the hour only, but for future years; for the few men in the forefront of an enduring and a laborious Art; for the disciplined ranks of a distinguished Profession; for the young men—Architects to be—and for all who love a clustered column or a flying buttress, a traceried window or a Greek frieze; for the man, too, who honestly plumbs a jamb. . . . . .

EFFINGHAM HOUSE,
ARUNDEL STREET, STRAND,
LONDON.

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Prentice, architect), No. cccxxxiii; House, De Pary's Avenue, Bedford (A. N. Prentice, architect), No. cccxxxiii; Entrance Gates and Lodge, Cavenham Hall, Suffolk (A. N. Prentice, architect), No. cccxxxiii; Three Cottages, Park Farm, North Cheam, Surrey (H. D. Searles Wood, architect), No. cccxxxiv; "Harcourt," Christchurch Park, Sutton, Surrey (H. D. Searles Wood, architect), No. cccxxxiv; Edinburgh City Chambers (R. Morham, architect), No. cccxxxiv; House at Windermere (Thomas H. Mawson, architect), No. cccxxxv; Workshops for the Birmingham Guild of Handicraft (Arthur S. Dixon, architect), No. cccxxxv; House at Southborough, Tunbridge Wells (Sidney V. North, architect). No. cccxxxv; Trinity College, Cambridge (W. D. Caröe, architect), No. cccxxxv; Chapter House, Glasgow Cathedral (measured and drawn by Alexander T. Heathcote), No. cccxxxvi; New Cathedral, Capetown (Herbert Baker and Masey, architects), No. cccxxxvi; Terrace and Summer Houses, Dalham Hall, Suffolk (T. H. Mawson, C. E. Mallows and G. Pocock, architects), No. cccxxxvii; Rood Screen, Glasgow Cathedral (measured and drawn by A. Wagstaff), No. cccxxxvii; Labourers' Cottages, Maidstone (F. Harding Payne and J. Owen, architects), No. cccxxxvii; Cottages at Biddenham (E. Harding Payne and J. Owen, architects), No. cccxxxvii; The New Radcliffe Library, Oxford University (T. G. Jackson, architect), No. cccxxxviii; The Ryks Museum, Amsterdam (J. P. H. Cuypers, architect), No. cccxxxviii; Gothic Vaulting (by J. A. Marsoall), No. cccxxxviii; Design for Leeds School of Art (Albert E. Dixon, architect), No. cccxxxix; Proposed New Stables and Coachman's House at Oakover, Ticehurst (Ernest Emerson, architect), No. cccxl: Additions to the Chancel of St. Bartholomew's Church, Brighton (H. Wilson, architect), No. cccxl; Selected Design for New Municipal Buildings at Hereford (Henry A. Cheers, architect), No. cccxl.
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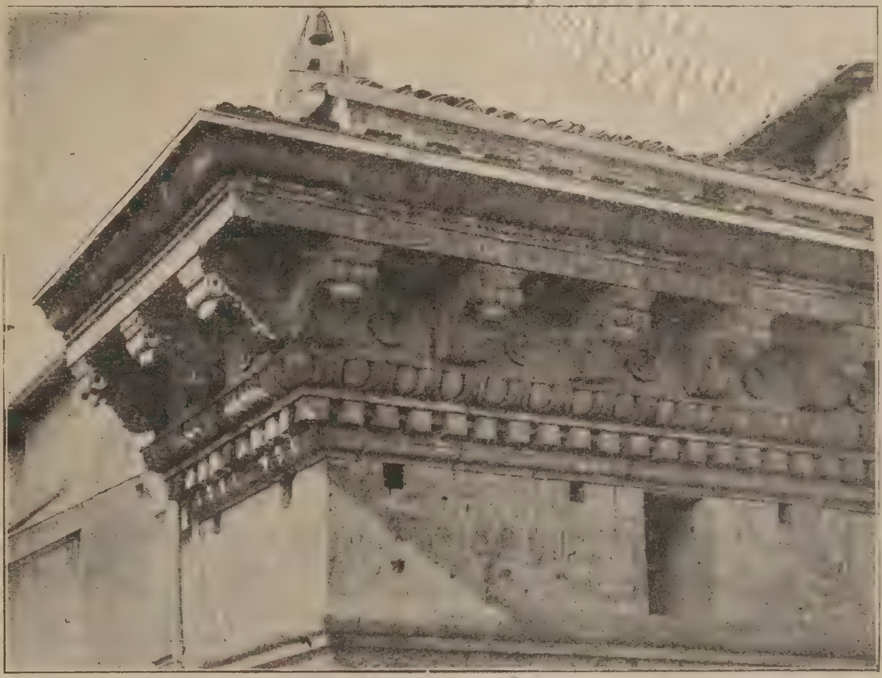
THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

February 6, 1901.
No. CCCXIII.

Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

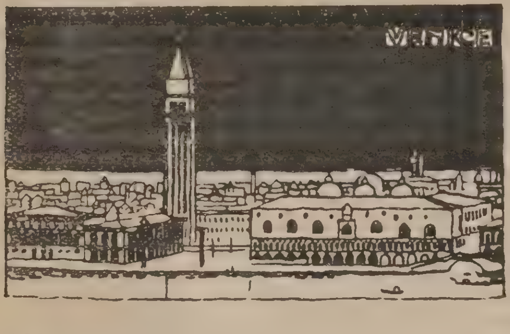
"The Gates of Paradise." The birth of Renaissance architecture dates roughly from the competition for the Baptistry gates in Florence. Long before this time there had been signs indicative of a change. Giotto and Taddeo Gaddi his pupil, with others, had broken away from the traditions and conventions that had been the rules for painters, sculptors and architects, but it was for the few enthusiastic goldsmiths who entered this competition to thrust on one side, almost violently, the ideas of their immediate forerunners. The competition, promoted by the Priors of the Art, was open to all the goldsmiths and sculptors in Florence. They were to model in relief a single panel of the "Offering up of Isaac," and a whole year was allowed them for the task, which was to a great extent simplified by the fact that they were to follow an earlier gate executed by Andrea Pisano. Nearly a dozen of the young goldsmiths entered the competition, and most of them became famous in after years. It is interesting to note here how many architects and sculptors of the Renaissance emerged from the goldsmith's shop; its influence is most marked in much of the early work. (In Spain early Renaissance was called Plateresco, or gold and silver plate work.) When the time came for examination and award, the judges found themselves at a loss to decide between the merits of two young men and a mere stripling—Ghiberti, Brunelleschi and Donato, afterwards called more familiarly Donatello. Brunelleschi and Donato decided the matter; when they saw the work of their rival they both stepped aside, declaring that the prize must be adjudged to Ghiberti for the honour of Florence. Ghiberti was very greatly influenced by the wave of naturalism which had transformed painting into a living art. With great daring he seems to set aside every rule and convention, to make splendid revolt against the canons of ecclesiastical tradition, which the earlier men had put more gently aside. It is doubtful whether he chose the most effective method for the decoration of the gates, which seemed to some of his contemporaries worthy to be the portals of Paradise. There was undoubtedly something in his art which dazzled and subdued them by its absolute newness. The very joy of life carries him out of bounds, even to the forgetfulness of his material. He seems to wish to transfer the effects of painting to bronze, and in the larger pictorial panels manages to introduce upon almost flat surfaces scenes and groups on different planes of perspective—landscape effects, with all the accessories and details, except the colours. His literalism and want of simplicity is annoying, yet there is such exuberant delight in the work, such a mastery of detail, and such a love for birds, squirrels and flowers that we almost too readily forgive him; standing at a distance, nearly all the delicate modelling is lost, and the arrangement in the architrave of the groups of birds and beasts among flowers and foliage is confusing. The suggestion of growth so often found in mediæval work has no place here, and the change from one mass of foliage and beasts to another variety is almost clumsily achieved by tying them together with ribbons, a favourite but stupid method copied by less able men who came after him. He was the first sculptor to introduce perspective into his art. He treated everything he touched with the skill and delicacy of the goldsmith, and made some famous jewellery—a single precious button for a Pope, or such a ring as that of Giovanni de Medici, a cornelia from Nero's treasury, set as a winged dragon emerging from a cluster of ivy leaves. Ghiberti's work, and his gates particularly, show perhaps more than any other great craftsman of the Renaissance the influence of his training in the goldsmith's shop. It is full of charm and refinement in detail, and is really the work of a Greek, revelling in nature, forgetting his serenity in the joy of re-creating in material the wonders of bird, foliage and animal life.



CORNICE, PALAZZO DEL GOVERNO, SIENA. DATE 1469. ROSSELLINO, ARCHITECT.

Brunelleschi and his Dome. There was a great work to do in Florence. The problem of covering the vast octagonal opening and the three apses of Santa Mari di Fiore was still unsolved, and the great church was doomed to remain unfinished till someone should come with greater daring than the feeble theorists who proposed to fill the space by first building up a mound of earth and then placing a dome on top of it. Filippo Brunelleschi was the man to do it; he saw the task awaiting him, and in order to prepare for it went with Donatello to Rome, where they worked together in the same goldsmith's shop, studying hard and working in gold and silver. Donato eventually went back to Florence, and Filippo was left alone in Rome, where he laboured continually among the ruins and studied more industriously than ever. He drew the details of every kind of building—round, square and octagon, basilicas, aqueducts, baths, arches, and the Coliseum and Amphitheatre—in which he especially examined the methods of building and clamping. He also pondered over the difficulties involved in the vaulting of the Pantheon, and whenever he found fragments of capitals, columns, cornices or basements of buildings buried in the earth he employed labourers to dig them up so that he might examine them. When Brunelleschi came back from Rome the Board of Works, hearing of his studies, sought his advice. Now was Brunelleschi's chance, and he seems to have gone to work very warily, for the chronicler tells us that if the master-builders had seen difficulties Filippo showed them far more. And someone asking, "Is there then no mode of erecting it?" Filippo, who was ingenious also in discourse, replied that if the thing were really impossible it could not be done. On hearing this, we can imagine that the Board of Works came very near despair. The wise Filippo, however, went on to surmise that "there ought to be someone in the world who could do the work, and seeing that it was a religious edifice the Lord God, to whom nothing was impossible, surely would not abandon it." The Board of Works pondered these sayings, and on May 7th, 1417, voted to give to Filippo di S. Brunelleschi for his labour in concerning himself about the cupola ten golden florins. In the following year the matter was thrown open to public competition, and fifteen models were presented. Brunelleschi's was of brick, and in its construction he showed how, by an invention of his own, a dome might be built without centering. He wrote a paper describing his plan. His method was to build two octagonal domes or cupolas, separated by a space so as to allow a passage or stairway, united by eight strong ribs of masonry at each angle and by sixteen smaller concealed ribs on the face of the vault. The paper finishes with this straightforward and workmanlike suggestion: "Above the height of 30 braccia (about 57ft.) let it be built in the way that shall be advised and resolved upon by the master who shall then be in charge of it, for in building practice teaches what is to be done." The old chronicler says that "he showed himself as sure of what he said as though he had already built ten cupolas." For months the Board of Works could not trust themselves to come to a decision, and when they finally engaged him stipulated that he was only to build it up to 20ft., so that they might be able to reconsider the experiment. Finally the consuls and the four officers of the cupola chose Brunelleschi, Ghiberti (who had just finished his gates) and Battista d'Antonio, the head master-builder, to oversee and direct the work.

G. Ll. M.



AN ARCHITECTURAL CRAFTSMAN'S VISIT TO ITALY.*

BY PROF. CHAS. GOURLAY, B.SC., A.R.I.B.A.

BY architectural craftsmen we mean all those who devote their energies to the perfecting of building work either as regards beauty of form or stability. By all such at least one visit should be paid to the Continent, even though it be for a few days only. Such a visit enables us to realise our insular position better than any amount of reading, and, further, is a powerful incentive to reading and study.

Before visiting a building which is worthy of study, either at home or abroad, we read about it, and thereby form our ideas of its nature and characteristics. On actually viewing the building our thoughts run in most cases in one of three channels: (1) that of destructive criticism impelled by disappointment—in other words, dissatisfaction; (2) that of satisfaction—by which I mean that you find the building to be just what you were led by your reading to expect it would be like; (3) that of exaltation, because not only has the building all those characteristics which you expected it to possess, but, including its situation and surroundings, it so strikes you that you are quite delighted with it, and you feel that all the discomforts of travelling and other troubles incidental to circumstances were well worth surmounting for even a short time of such joy.

Then we come home and we *think* about the building we have seen. For the true craftsman cannot forget a building which by study on the spot he has made his own. We then begin to realise that, whether we were disappointed or satisfied or exalted when we studied the building on the spot, we have received from our actual contact with it an inspiration which is part of ourselves, and which acts continually on our minds, impelling us onward in the work of our lives.

The architecture of Northern and Central Italy, which I visited last year, seems to me to be readily divided into three main groups, named after the former capitals of the provinces. If we begin at the north, we have first Venice with the architecture known as Venetian; then Florence with what is called Florentine architecture; and then Rome, with Roman architecture, which statement however applies to both ancient and modern work. Let us begin with Venetian, which, besides being the most northern, is the style from which I think the younger student can learn most that will be of value to him in his everyday work in this country. One reason for this is that Venice is, like Great Britain, protected by her position, being that of a group of islands. When Venice was attacked in the former days, the fighting was done on the sea, and when the buildings of which you are now to see views were erected Venice was "Mistress of the Sea," and so her inhabitants could and did build "homes" not "castles." Therefore we find in her architecture large open windows and doorways, balconies, &c.—no buildings exhibiting a fortified appearance.

In this lecture the first slide was a bird's-eye view of Venice to show the relative position of the various parts and buildings of Venice. Then Byzantine architecture in Venice and Ravenna illustrated by views of S. Mark's, Venice, and S. Appolinare in Classe and S. Appolinare Nuovo, Ravenna. Gothic architecture in Venice and North Italy was shown by views of the Doges' Palace and the Ca d'Oro, Venice, also by S. Zeno, Verona, S. Ambrogio and the Cathedral, Milan; Renaissance architecture in Venice and North Italy by views of the churches of S. Michele, S. Giorgio Maggiore, the Redentore, and S. M. Salute, Venice, and S. M. Grazie, Milan; and the civil architecture by views of the interior courtyard of the Doges' Palace, the Palaces of Grimani-San-Polo, Vendramin-Calergi, Grimani and the Rezzonico-Browning, Venice, and by the Palaces del Consiglio and Bevilacqua, Verona, and the Palace Municipio Vicenza.

The Romanesque in Tuscany was shown by views of the Pisa Cathedral, Baptistery and Leaning Tower, also by the Baptistery Pulpit, Pisa, and that in the church of S. Andrea, Pistoia. The Gothic in Tuscany was shown by views of Siena and Florence Cathedrals. The Renaissance in Tuscany by the Renaissance stalls and Piccolomini Tomb in Siena Cathedral, by the external pulpit of Prato Cathedral, the exterior of the Baptistery, Florence, the interior of S. Spirito and the cloisters of S. Lorenzo, Florence; then the courtyard of the Palace Vecchia and the Uffizi, Florence, the Palace del Governo, Siena, and the Palace Uguccioni, Florence, the Loggia dei Lanzi, Florence, and the Hospital del Ceppo, Pistoia.

Ancient architecture in Rome was illustrated by views of the exterior and interior of the Pantheon, the theatre of Marcellus, the Colosseum, and the triumphal arches of Titus, Septimius Severus and Constantine. Early Christian architecture in Rome by San Lorenzo without-the-walls, the arch of triumph in St. Paul's without-the-walls, and the cloisters of St. John Lateran. Renaissance architecture in Rome by views of St. Peter's, the Sistine Chapel in the Vatican, the west end, east and interior of S. M. Maggiore, S. Pietro in Montorio, the courtyard of the Vatican and the Cancellaria Palace, the façade and courtyard of the Farnese Palace, the courtyard of the Borghese Palace, and lastly, the Trevi Fountain.

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* Summary of a lecture delivered before the Architectural Craftsmen's Society of the Glasgow and West of Scotland Technical College on January 11th, 1901.

BUILDING CONTRACTS FROM A BUILDER'S POINT OF VIEW.*

BY FRANK N. COWLIN.

IN the olden days it was, as you know, the custom for the architect to personally superintend the erection of his own work, and so to-day, if perfect work is to be produced, it is essential for the architect and builder to be in sympathy with one another, in order that the true spirit of the design may be carried out. To ensure absolute perfection in workmanship, only approximate prices should be given and the work executed upon a percentage on cost basis, or at day-work prices; either of these courses, from a builder's standpoint, may be considered ideal, though, as such, would not commend themselves to the ordinary commercial proprietor, who has generally far more consideration for his pocket than for architectural effect. There can however, I think, be no doubt that in the majority of cases bad workmanship is the result of low prices and strained relations between architect and builder; and when this fact is fully realised, and architects make up their minds to minimise competition to fair and reasonable proportions, and also to make the conditions under which the builder has to work as easy and comfortable as possible, then I think they will find very little cause to complain either as to the quality of the workmanship or the manner in which it is executed. To a builder the two most important factors in connection with building contracts are the conditions or form of contract and the bill of quantities. If the former is fair and reasonable and the latter correct and explicit, he may (should he know his business), with ordinary luck, rely upon getting through his work without losing any money, and if the conditions under which the contract is taken happen to be favourable and the competition not too keen he may make a profit. Losses on contracts, outside those occasioned by sheer misfortune, can, in nearly all instances, be traced to certain causes, and in the majority of cases these are (1) misconception of the conditions of contract, whereby you contract to carry out considerably more than you bargained for, or (2) inexplicitness on the part of the quantity surveyor. Speaking in this connection, cases have come to my own knowledge where surveyors have been instructed to make their quantities as inexplicit as possible, with a view to deceiving the competitors, and so keeping down the amount of the tender. I am pleased however to say that in the instances referred to the surveyors did not follow their instructions.

With regard to the form of contract, for my own part I much prefer a sheet of notepaper saying that I am prepared to do certain work for a certain sum to an architect's satisfaction, and specifying the terms of payment. It is obvious, however, that in a large number of cases, and with most persons, this course would be unwise, and that a properly drawn form of contract is preferable, setting forth in precise terms what is agreed upon. Originally these contracts were drawn on behalf of the building owner by his solicitor, who was paid, I presume, so much per folio; the innocent builder of the days of our youth, confiding as a child, would not employ a solicitor to look after his interests, and, being anxious to secure the work, would sign anything he was asked. As a consequence we have handed down to us forms of contract which I think I am safe in saying many of us have signed without reading, and even if read, not understood, contracts to which if we had been legally held would have resulted in our seeking fresh fields and pastures new. But in recent years things have changed, and although we are continually being asked to sign many different forms of contract there is rarely little trouble in getting architects to see that there are two sides to every question, and that the builder is every bit as much in need of protection as the building owner. It is extremely rare for any contract now to be put before a builder which does not contain an arbitration clause, and yet fifteen or twenty years ago any man that asked for such a thing was regarded as a dangerous individual. It is strange that builders should have for such a long time existed without such a clause, and this may well be regarded as an example of their easy and tractable nature. All other contracts between business men invariably contain it, and to my mind, in the building trade, with its many complications, it is all the more necessary, as much from the employer's point of view as the builder's. The general impression seems to have been that unless the builder was entirely in the power of the architect disputes would be constantly arising. Time however has proved differently, and as the insertion of the clause protects builders from unprincipled architects or so-called architects it has also the effect of causing employers and architects to exercise more care in the conduct of their works.

Different Forms of Contract.

There are many different forms of contract, but those in most general use are that agreed upon by the Royal Institute of British Architects and the National Association of Master Builders, and that issued by the R.I.B.A. Both of these are a most distinct improvement on those in use before they were issued, and are very similar to one another. The former has since been objected to by the R.I.B.A., and has resulted in the issue by them of the latter. The difficulty arose over, I believe, the arbitration clause. In the original contract, in the event of any dispute arising, either party might immediately proceed to arbitration whilst the works were in progress. This was objected to, and in the form issued by the R.I.B.A. the following clause is inserted: "Such reference, except on the question of certificate, shall not be opened until after the completion or alleged completion of the works, unless with the written consent of the employer or architect and the contractor." From my point of view the clause in the original contract is much preferable; to a builder upon a large contract, dealing with men with whom he is practically unacquainted, it appears to me to be most vital. In the event of a dispute occurring in connection with extra depths or other works to foundations, involving the expenditure by the builder of some thousands of pounds, if he is unable to get the matter settled as he proceeds, he may have it hanging over his head for three or four years until all the circumstances are forgotten, during which time he is also being kept out of his money. On the other hand, the argument may be raised that a contentious builder might start arbitrating at the commencement of a contract and go on arbitrating until the finish. This is a case which I do not think would ever occur, and in this my opinion is confirmed by my experience of the working of the arbitration clause. With this exception I would be prepared to agree to either form, both of which can only have been compiled after much careful thought and expenditure of time.

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* A paper read before the Bristol Society of Architects on January 14th, 1901.

Much difficulty is, as a rule, experienced in dealing with urban and municipal councils in connection with forms of contract, as they often require conditions much more drastic and arbitrary than any other body. They are however gradually learning wisdom, and when they find, as they often do, that respectable firms will not agree to these conditions they are prepared to modify them. Doubtless the course they adopt is taken in self-defence, and if such a course is necessary, and is founded on experience, they have my sincerest sympathy. The forms of contract issued by the War Department, Admiralty and Board of Works are also fair and reasonable, and in many cases their terms of payment are more favourable. Many architects adopt forms of their own. Of these experience has taught me to be careful, and always, if possible to avoid signing. With two such forms as those already referred to, there is no necessity to go any further.

Speaking of forms of contract generally, the principal points the builder has to consider are (1) time clause, (2) terms of payment, (3) inability of proprietor to pay, (4) liability for acts of other persons or things, (5) maintenance clause, and (6) arbitration clause. As to

The Time Clause.

In the majority of cases this is more honoured in the breach than the observance, and for the reason that the time is named without thought, and in most instances is altogether inadequate. Considerable dissatisfaction is caused to the proprietor, who cannot understand reasons for delay, and is therefore most anxious to obtain from the contractor damages to which he is not entitled. It is most decidedly to a contractor's interest to get his work done as quickly as possible, and for the benefit of all concerned a reasonable time should be appointed in which the work can fairly be executed; to this both the contractor and the architect should be held, delays in many instances arising as much from dilatoriness on the part of the architect as on the part of the contractor. In reference to the

Terms of Payment.

From time immemorial it has been usual to pay 80 per cent. on the value of the work executed and fixed in its place. Since this arrangement was instituted the times have considerably altered, and it is impossible for a builder now to obtain the same terms from merchants and manufacturers which he got eight or ten years ago. Then it was usual to be allowed four or six months' credit on most goods, and on timber six months, whilst in several cases twelve months' accounts were allowed. Now all timber, iron, stone, bricks, cement, and, in fact, by far the largest portion of the materials used in a building, have to be paid for in a month following delivery, whilst in a few favoured cases a three months' account is allowed. This, you see, means practically a cash business, so that it is impossible to carry on anything like a large establishment on the old conditions. According to the terms of all contracts, all materials delivered on the ground become the property of the proprietor, and therefore they should be taken into consideration when the certificate is granted, and payment should be made on account of them. This you may say is liable to abuse in the case of a shaky builder, but, by the exercise of some care and tact on the part of the clerk of works and architect in granting the certificate, I fail to see how any difficulty can arise, and in any case the proprietor is protected because he has the goods and also the margin of the reserve. With regard to the percentage to be paid, this should I think be increased to 90 per cent. If 80 per cent. was the standard twenty years ago, the manifest change in the conditions of trade since and the increase in competition and decrease in profits fully justify one in asking for the 90 per cent. Wages have to be paid weekly and form, roughly speaking, 50 per cent. of a builder's turnover, and this, with the shortened terms of credit makes it most difficult to finance a builder's business; so much so, that no matter how profitable a business you may be transacting you find it impossible to get on without borrowing from your bankers, for which luxury you have to pay pretty dearly.

As to the amount of the reserve. This, of course, varies with the amount of the contract, but for contracts up to £10,000, 10 per cent. is I think now a generally accepted amount. Beyond that sum it is a matter of arrangement. Personally, I fail to see the necessity for a large reserve or the need of retaining it for any length of time. Much of course depends upon the character of the builder, but in ordinary cases I think it is fair

PALAZZO GRIMANI S. POLO, VENICE. ERECTED BY ONE OF THE LOMBARDI, SHOWING THE SIMPLICITY OF THE EARLY RENAISSANCE.

S. MICHELE, VENICE. MORO LOMBARDO, ARCHITECT. DATE 1466. AT THE ANGLE, THE CAPPELLA EMILIANA, BY BERGAMASCO. DATE 1530.

to pay half the reserve at the completion and the remainder at the settlement of the accounts, retaining some nominal sum for a further period of three months, sufficient to make good any defects that might occur during that time. Such an arrangement as this would be an incentive to builders to get their accounts settled quickly, and much inconvenience and trouble to architects would be saved.

Inability of Proprietor to Pay.

The next clause of importance is one which should make the proprietor liable to pay within a reasonable time after the deposit of the certificate. This is a point which is a very sore one with builders. They are expected to perform their part of the contract, but it is not at all unusual to find that after having obtained (maybe after considerable trouble) a certificate for a payment on account it takes a further four or five weeks to obtain payment. A clause to protect builders in such cases should be introduced in all contracts, as I am glad to say it is in the forms issued by the Builders' Association and the R.I.B.A. Much trouble and annoyance would be saved also if a clause were inserted by which payments would be made at stated intervals, no matter how small or great; then the proprietor would be prepared to meet the certificates as they were presented.

The Contractor's Liabilities.

The next clause I wish to touch upon is one making the contractor liable for any loss or damage whatsoever to the premises from whatever cause arising and until the expiration of the term of maintenance; it is often introduced into contracts other than those I have mentioned. The contractor's liability should cease as far as loss or damage is concerned when the buildings are completed and handed over.

The maintenance clause I have already touched upon. It is one in which a great deal is left to an architect to decide, and when he happens to be weak and the proprietor is strong the position of the builder becomes uncomfortable.

There are two clauses in the contract of Messrs. —— which are I think worthy of consideration. The first is the reference clause, which is as follows:—"The architects shall during the progress of the works have the powers above described, and shall be the sole judges in all matters relating thereto as to the interpretation of the drawings and specification, as to the execution, condition and extent of the work from time to time actually executed, as to the quality of the materials used or to be used in and about the several works, and as to the degree of despatch with which the works should be conducted and carried on and in all matters of account connected therewith, and as to any question which may arise as to the progress and conduct of the works or deviation from the specification and drawings, and in respect thereof their decision shall be final. But in case after the building shall be completed any dispute or difference shall arise between the employer or the architects on his behalf and the contractor in respect of the contract or of anything connected therewith or relating thereto or to any additional works or variations thereon, or as to what addition (if any) ought in fairness to be made to the amount payable to the contractor by reason of the works having been delayed through no default of the contractor or by reason or on account of any directions or requisitions of the architects involving increased cost to the contractor beyond the cost properly attending the works according to the true intent and meaning of the signed drawings and specification, or as to the construction of these presents, such difference shall be referred to the arbitration of ——."

The point I particularly wish to refer to is that portion which says, "or as to what addition (if any) ought in fairness to be made to the amount payable to the contractor by reason of the works having been delayed through no default of the contractor or by reason or on account of any directions or requisitions of the architects involving increased cost to the contractor beyond the cost properly attending the works executed according to the true intent of the signed drawings and specification." Contractors are continually being put to considerable expense by the causes enumerated above, and although it must be patent to both architect and clerk of works that they are fairly entitled to it, I have only once in my own experience heard of an architect granting such a sum, except under pressure. It should be distinctly understood in such cases that a builder is to be paid what is fair and reasonable, and this should be left to the architect, or failing him, to arbitration. The second clause is as follows:—"Notwithstanding anything hereinbefore contained, the contractor shall not be responsible for the act, default or omission of any other contractor employed by the employer in or about the execution of any of the works comprised on the specification or in or about the execution of any other works upon the site." It speaks for itself, and I, speaking from very bitter experience, can testify to its importance.

This, gentlemen, in brief is all I have to say as to the conditions of contract, and I now come to what is just as important from a builder's point of view, and that is the question of

Quantities.

In this connection it is very pleasing to note that during the last few years there has been a most distinct improvement in the quality of the quantities supplied, and that the custom of allowing the surveyor to measure up for and settle all accounts is becoming more general. The advantages of this, from both sides of view, must I think be obvious, and whilst perhaps it may be more advantageous to a certain class of builder to settle accounts with an architect who is not so well up in prices and variations as a fully-qualified surveyor, it is to the benefit of the trade generally to leave the accounts in the hands of the latter; any profits made have then to be made on the basis of the prices quoted, and not on the basis of one's powers as a debater, to put it as mildly as possible.

A most important point in connection with bills of quantities, and one upon which in this district there are many diversities of opinion, is the question as to whether they shall be the basis of the contract or not. Many builders I have spoken to upon the subject prefer that they should not, and that the custom generally prevailing here of checking the quantities and then taking them as correct is preferable. Personally I cannot agree with them. It is not part of a builder's business to check quantities, and in a large contract it means a very great cost. In my opinion it is not fair that a man should be paid for work he does not do, and in this system this most invariably occurs.

It is usual for a builder in checking quantities to discover only items that are short or entirely omitted and to get these allowed, whilst nothing is said about items that are full, and if a builder is of a particularly suave and persuasive nature he is enabled to get more allowed to him than he is fairly entitled to. A surveyor, if he knows his business, should be able, and is able, to take off quantities that are correct, and upon these the contract should be based. This is the system that obtains generally in London and the north of England, and it is found to work satisfactorily. In many instances, notably in Government work, the quantities are guaranteed. This is practically the same thing as making them the basis of the contract, and it speaks volumes for the character of their work that surveyors are prepared to do this even when the contract amounts run into several hundred of thousands of pounds.

The main results of this system are, (1) a vast improvement in the quality of the quantities, a surveyor's reputation entirely depending upon their exactitude, whilst under the old system any mistakes might easily be covered up; (2) it has shown builders that a complete knowledge of the cost of their work is absolutely necessary, and this must tend to improve prices and the status of the trade generally. If a builder is only paid for exactly the amount of work carried out, it follows that his prices must be correct if he is to make a profit. He cannot assume, as one does at present, that the quantities will be full with one man and short with another. It reduces the speculative character of the business and enables a firm to more fully trade upon their merits. It is the custom in Scotland to remeasure the work on completion, and to pay at the original schedule rates. This, assuming the original schedule to be correct, is practically the same as making the quantities the basis of the contract, and this system is found to work satisfactorily, and is the outcome of previous experience. The only argument as far as I can see that can be used against it is, that possibly in the event of the quantities being incorrect the building owner cannot tell exactly what he will have to pay for his work when he starts. This argument speaks little for the ability of the surveyors, and the contingency named is, I think, one which would very rarely occur.

The next question I would like to deal with refers to

Prime Cost Sums and Provisional Amounts.

Different surveyors have different ways of considering the term p.c. It is usual to mention that it means nett cost; and then the question naturally arises, what is nett cost? Does it mean nett cost to the contractor or nett cost to the ordinary consumer; and this opens up the question of trade discounts, and then the trouble begins. It would I think be well if trade discounts could be altogether abolished. In tendering you are told to add your profit, and this I usually make a point of doing. If there are a large number of p.c. amounts I usually lose the contract, which is obtained, perhaps, by a contractor of a more speculative nature, who does not add any profit at all, but who, in the settlement of accounts, does not divulge the nett cost of the articles in question, and perhaps by pre-arrangement with the merchants supplying the goods, or by argument, or to use a slang expression "bluff," is enabled to obtain the trade discount and in all probability obtains a larger percentage of profit than I should have added, and that at the cost of the proprietor.

Many firms, especially when they quote the architect direct, refuse to allow any discount, or if they do allow it, it is distinctly stated in their quotation, so that no misconception can arise.

It is fair to assume that a builder must make a profit on these amounts, and if it could be generally understood that all architects and surveyors would allow 10 or 15 per. cent., or any stated percentage, upon the actual nett cost to the builder of the goods in question, and that this sum would be added by the surveyor in preparing the quantities, much discussion, misconception and bad feeling would be avoided. We have lately tendered for a contract under Messrs. ——, and in their conditions in reference to the p.c. amounts they have the following clause:—"The whole of the provisional sums and prices throughout are understood to bear a 10 per cent. discount to the contractor, and he is, it is understood, entitled to no further profit on these provisional amounts." This to my mind is a very satisfactory way of dealing with the difficulty, and as they also have a condition that the receipts for the various goods are to be produced, if necessary, they are well protected against any unscrupulous contractor.

In a contract we are carrying out the question of p.c. sums is dealt with in the specification by special note as follows: "that wherever the word 'provide' or 'prime cost' is used the amounts thus mentioned are to be expended at the discretion of the architects, and the architects may require the amounts thus mentioned to be paid by the contractor nett to any tradesman selected by them on their certificate, or such amounts may be certified on the proprietor direct and deducted at the settlement of the accounts."

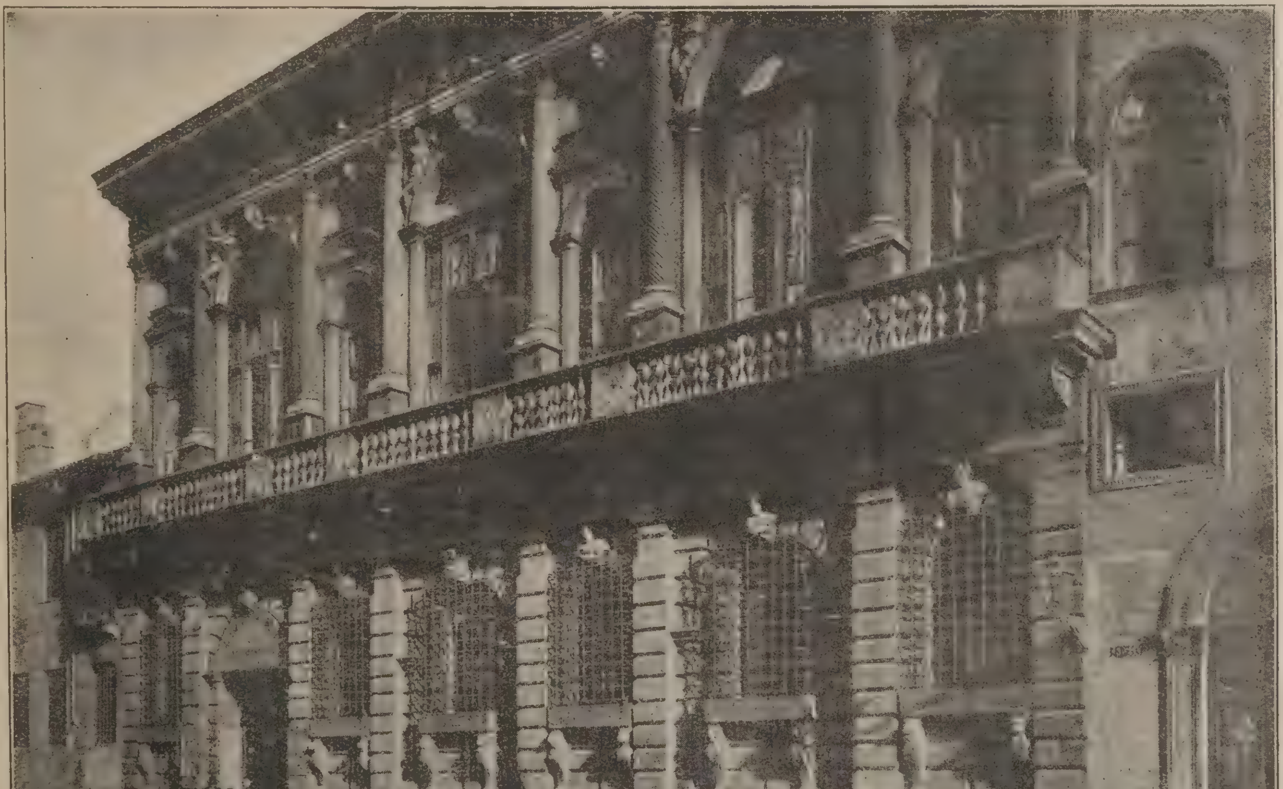
In the quantities there is a special bill for provisional sums and works in connection with them. As each sum is mentioned so the discount upon same, if any, is given. At the end of the bill a clause is inserted which summarises the amounts in the following terms:—"The total sum of the above provisional amounts is (say) £4,000, of which part will be expended at contract rates or deducted at the settlement of accounts, and part is subject to discounts as stated, but as regards the sum of (say) £3 500, allow for all builder's profit and establishment charges, &c, &c." This, perhaps, in a large contract which contains a large number of provisional sums, is the best way of dealing with them. There can be no misconception, and if the contractor does not add his profit he does not get it.

A very general fault I find in quantities in this district is, that there are not enough provisional sums included. Oftentimes, more particularly in alteration works, one has to price items the cost of which it is impossible to accurately estimate until the work is being done. In all such cases a provisional sum should be inserted at the discretion of the surveyor, and the matter adjusted at schedule rates.

Again, with regard to spot items, the descriptions are often most inadequate. From a builder's standpoint, all items should be so described as to render it unnecessary for him to be continually referring to the drawings when preparing his estimate. It is not at all unusual to find the thickness of walls omitted in items for drawing openings for doors and windows, and the sizes of the same are also left to the imagination of the builder. On enquiry you are of course referred to the drawings.

The preparation of estimates is a most serious matter in a builder's business. Unless he is in a very large way he has to do most of the pricing himself, and when one considers the time this occupies and the number of estimates he has to send in for every one he is fortunate enough to get the necessity for the quantities to be as explanatory and explicit as possible is apparent. In quantities, as with everything else, it is the best that is the cheapest, and I am confident from my own experience that the interests of the proprietor, and also of the builder, are best safeguarded if a first-class surveyor prepares the quantities and adjusts the accounts. Much more might be written upon this interesting subject of quantities, but time does not permit.

Another important factor in considering building contracts is the clerk of works so important a factor that I am of opinion that he deserves a paper to himself. Too much consideration cannot be given by an architect in selecting his clerk of works. One man, if he is not thoroughly conversant with his work, both practically and theoretically, may make the work cost 5 or 10 per cent. more than another man, whilst both attain the same result. In many instances they have absolutely no conception as to the duties of their position, but imagine that all they have to do is to see that proper materials are used. My own idea is that the clerk of works should be



PALAZZO BEVILACQUA, VERONA. MICHELE SAMMICHELE, ARCHITECT. DATE, CIRCA 1527.

the architect's representative upon the works, and as such he should be prepared to obtain and give all information necessary to the proper carrying-out of the contract; he should be responsible, with the builder's foreman, for the proper setting-out of the various parts of the building, and should also in a measure be responsible for the time taken to complete the contract. It would be a very good thing if they could be engaged at so much per contract. I think architects would then find their works executed with much more promptitude and despatch. There are many excellent clerks of works I have had to do with, and I have to acknowledge many kindnesses at their hands, but I really do not think that architects generally appreciate the harm and annoyance which an incompetent or unprincipled man causes a contractor, who in the majority of cases is powerless to complain, for reasons which must be obvious.

In conclusion, there are three points in building contracts that I would strongly impress upon architects:—(1) The necessity of keeping up all approximate quotations: 90 per cent. of the troubles between architect and builder, and also the proprietor, arise from the fact that in the majority of cases the cost is considerably more than was expected. (2) To remember that it is essential for the good of the community that the builder makes a profit. If he is not allowed to do it fairly, he is, I fear in many cases, apt to do it unfairly. (3) Always be prepared to grant certificates if the money is due. The financial question is a most important one with builders, and whilst there is no difficulty in obtaining the first payment, one has often to write two or three times without getting a reply in one's efforts to get further certificates. Speaking as a contractor who has sufficient capital for the amount of business done, I can honestly state that more worry and anxiety is caused the builder over this question than by any other detail in his business.

GLASGOW ROYAL INFIRMARY.

Dr. Duncan's Objections.

AT the annual general meeting of qualified contributors to the funds of the Glasgow Royal Infirmary held last week, Dr. Ebenezer Duncan said that the present building was very antiquated according to the modern standard, and it could not by any extension on the part of the directors be made a modern hospital. He was of opinion that, in the first place, the site was not one which was by any means suitable for the treatment of a large part of the inmates. He asked the meeting to bear in mind what was the result of modern investigations in regard to tuberculosis, one of the main sources of disease treated in their hospitals. In the treatment of tuberculosis what was wanted was an absolutely pure atmosphere and abundance of fresh air. Recent investigations had shown that in the Glasgow hospitals, taking the surgical side of the hospitals, they had 25 per cent. of the patients suffering from various forms of tuberculosis in the various organs, and a surgeon told him that in his opinion general hospitals in Glasgow were not the places for the treatment of such cases; they ought to be in the fresh air of the country. He asked any man if the air of that neighbourhood where the Royal Infirmary was situated was a proper place to treat consumption of the lungs, or asthma, or bronchitis, or pneumonia? Not only that, but as far as he could judge from the plans, it was proposed to have this hospital ventilated by the "plenum" system. He had had twelve years' experience of the "plenum" system, and while he believed that it was a great improvement on many of the systems of ventilation, and that it would be of very great benefit in the new Royal Infirmary, as a matter of experience he had found it impossible to prevent the air getting from one ward into the corridors and into the whole hospital. In a hospital where there were 700 patients they would in those circumstances get a condition of matters which would not by any means be sanitary, and which would be a great danger to the patients when any kind of epidemic disease broke out. For that reason, apart altogether from reasons connected with the site, he held that it was a great blunder to go on with this institution. He called their attention to the fact that the Institute of Architects in Glasgow protested against the plans. He asked the contributors to put a stop to a scheme which he believed would not be in the interests of the sick poor of Glasgow, but very much against their interests. He recommended that a small committee should be appointed by the Court of Contributors to meet the directors and discuss the matter. He moved an amendment to delete the part of the report approving the reconstruction plans. Ten voted for the amendment and twenty-three for the adoption of the report as submitted.

Builders' Notes.

An Auction Sale, on February 13th, of builders' materials and goods will be held by Mr. Harold Carpmael in the grounds of "Surrey Mount," London Road, Forest Hill, in consequence of the completion of the new permanent building for Horniman's Museum.

Alderman William Gankroger, J.P., of Halifax, who died recently, had been on the directorate of the Charlestown Brick and Tile Company, Limited, for over 20 years, being chairman for a considerable part of that time, and he was also chairman for the first four years of the six-years'-old syndicate of the United Brick Companies.

Sale of Building Land at Wimbledon.—A portion of the Wimbledon House Estate (better known, perhaps, as the property of the late Sir Henry Peek) is to be publicly sold on February 16th, as advertised in one of our columns. The auctioneers are Messrs. Hampton and Sons, and the land included in the present sale is divided into about 35 lots of almost every variety of size and position suitable for purchasers wishing to spend from £250 to £2,500. Houses will doubtless be erected shortly along the Common front and in the newly-made thoroughfares of the estate. Since the opening of the sub-electric railway from Waterloo to the City the demand for houses at Wimbledon has far outrun the supply.

Partnerships Dissolved.—The partnership heretofore subsisting between Messrs. John Hughes and Edwin Ramm, carrying on business as painters and decorators at Westbourne Road, West Kirby, under the style or firm of "J. Hughes and Company," has been dissolved by mutual consent as and from January 23rd, 1901.—The partnership lately subsisting between Messrs. Samuel Pattinson and William Pattinson, carrying on business as builders' merchants and coal merchants at Sleaford, in the county of Lincoln, and elsewhere, under the style or firm of "Pattinson and Co.," has been dissolved by mutual consent as from December 22nd, 1900. All debts due to and owing by the said late firm will be received and paid by Mr. William Pattinson, who will continue to carry on the said business under the style or firm of Pattinson and Co.

The Report of the East End Dwellings Company for the past year states that good progress is being made with the new buildings in the first portion of the Victoria Park Square Estate. They have been named "Gretton Houses," and it is hoped that they will be ready for occupation early in the summer. These buildings will contain 352 rooms, arranged in tenements of one, two and three rooms. When the whole of the new buildings have been erected on this estate accommodation will be provided for nearly 2,000 persons. The total population of the company's buildings was 6,079 at the end of 1900. This population gives an average of 878 persons housed per acre on the land actually in possession of the company. If one-half of the public thoroughfares on which the buildings abut is brought into the calculation the average is reduced to 647 persons per acre. The births for the year were 177, being an average of 29 11 per 1,000 of the population, and the deaths (including those in hospital) were 85, being 13 98 per 1,000. Mendip and Shepton Houses were opened in July, 1900, and, with the exception of the larger and more expensive tenements, are rapidly filled up. On all the other properties the letting was most satisfactory throughout the year, and on December 31st only one tenement and five workshops were unlet. The collection of the rents at Ravenscroft (£3,389 14s.) has again been effected without incurring a single bad debt, and with no arrears at the end of the year.

London County Council.—At last week's meeting of the Council the Housing of the Working Classes Committee recommended that the architect be authorised to expend a sum of £60 on overtime for the preparation of the working drawings of the Mill Lane, Deptford, lodging-house. The committee also recommended that the estimate of £16,500 be approved for acquiring, under Part III. of the Housing of the Working Classes Act, the Caledonian Asylum and the site. The buildings to be erected will provide accommodation for about 1,400 persons in 10 one-room tenements, 196 two-room, 93 three-room, and 4 four-room tenements. The recommendations were adopted. The estimate of £1,315,000 (in substitution for the capital vote of £51,443 which was approved by the Council on November 6th last) in respect of the Thames Embankment extension and Westminster improvements at Millbank was approved; and as the Council of the City of Westminster has undertaken to make the necessary contribution of £100,000, the Improvements Committee were authorised to incur expenditure on capital account up to £1,315,000 for the purpose of the improvements in question. Mr. Mayhew asked if the attention of the Theatres Committee had been drawn to the recent overcrowding of several theatres, and to the obstruction of the gangways, and if, in case of fire, there was the slightest chance of the audience escaping with their lives. Sir Algernon West informed the Council that the committee had done their utmost to point out to managers the dangers of the practices referred to, and to enforce the regulations.

Fire Tests with Doors.—We have received publications Nos. 54 and 59 of the British Fire Prevention Committee, both dealing with doors. The first test was with a 2⅓in. oak door constructed in three thicknesses and a similar door of teak. The door openings were 7ft. by 3ft. The following is a summary of the effect:—In 17 minutes flame appeared at one of the top corners of the teak door; in 36 minutes the flame had extended across two-thirds of the top; in 57 minutes a glow appeared at the bottom of the door; in 60 minutes flame came through one corner of the oak door and a glow appeared at the bottom; in 67 minutes the boards at each side of the centre joint of this door bulged outwards 1½in. and the joint opened; in 75 minutes the opening in the centre widened and flames came through freely, extending across the whole width of the door at the top; in 75 minutes also the flames extended across the whole of the top of the teak door and through holes along the bottom. By this time two of the thicknesses of the oak door had disappeared, though the outer thickness remained in position; while the inner thickness of the teak door was gone, the centre thickness charred through (but in position), and the outer thickness burnt away for about 4in. at the top. The doors were constructed with the aid of wood pins and the boards were simply butt-jointed, not grooved or tongued. The second test was with a deal ledged door with 1in. boarding and a 2in. deal four-panel door moulded both sides. The door openings were 3ft. 3in. by 6ft. 9in. The following is a summary of the effect:—In 4 minutes flame appeared over the top of the deal ledged door; in 8 minutes the flame had extended all along the top; in 15 minutes flame appeared over the top rail of the four-panel door; in 16 minutes the flame came through the top panel; in 21 minutes the flame came through the lower panels; in 21 minutes also the upper half of the ledged door was fully alight; and in 25 minutes the test was closed, both doors being then practically destroyed.

Law Cases.

"Extraordinary Traffic": a Successful Claim. At the Bakewell County Court recently the Bakewell Rural District Council sued Messrs. Roper and Roper, builders, for damages in respect of extraordinary traffic on a road known as the Sir William Road, situated in the parish of Eyam Woodlands. The amount of the claim was £48 16s. 5d. Mr. Cockerton (for the plaintiffs) said the damage was done to the road by the defendants' traction engine with two trucks conveying stone from a quarry which adjoined Sir William Road. The road was very much cut up, there being ruts in it to the depth of 18in., caused by the wheels and the heavy traffic. In October the road became so bad that defendants had to discontinue leading stone by the traction engine. It was an ordinary country road suitable for the traffic of the district, and in an ordinary way would have little traffic upon it. Defendants' counsel contended that the road was an old country road, and was previously in a bad state of repair, which lent itself to further damage, and this damage would not have occurred had the road been in a proper condition of repair. The Judge said he believed that the traffic caused by the traction engine was extraordinary and excessive in weight. With reference to the question of damages, it was shown that the average cost in past years had been something like £5 or £6 per mile, taking all the roads in the parish. During the first six months of 1900 £3 16s. had been spent on the road, whereas during the last six months £58 13s. had been spent on only a portion of it. Even doubling or trebling the cost during the first six months, there still remained as much as the plaintiffs claim, and he thought therefore that the amount claimed was by no means excessive. After some further remarks his Honour gave judgment for the plaintiffs, £18 16s. 5d.

Damage to Buildings by Railway Vibration.—Mr. J. W. Penfold, F.S.I., sat at the Surveyors' Institution last week as arbitrator in respect to a claim against the Central London Railway Company for injury done to No. 2 Lancaster Gate, W. The claimants were Lord Herschell and Mr. A. W. M. Baillie, acting as executors under the will of the late Mrs. Mary Cunliffe. Mr. C. A. Cripps, K.C., who appeared for the claimants, said that in consequence, it was believed, of the construction of the Central London Railway serious cracks began to appear at 2 Lancaster Gate, and there were indications that a serious sudsidence was taking place. Owing to these disturbances the tenant, Mrs. Hawkins, left, and the house now remained unoccupied. The owners claimed damages to the amount of £1,600. Mr. E. R. Robson, F.R.I.B.A., said he had inspected the house on May 17th, 1899, and found a number of cracks in the walls and ceilings. They seemed to him to be caused by a general disturbance of the foundations, due, he should think, to the construction of the railway. Mr. J. Bott, house-agent, described the damage as seen by him on several recent visits. The first house, No. 1, which was nearer the line of the railway, showed even greater damage, and steel girders had had to be introduced into the hall. The cracks he imagined to have been caused by the construction of the railway, and now that the trains were working the damaged houses were less able to stand the vibration. Mr. Mark Judge, A.R.I.B.A., stated that he had inspected the house in June last year, and was of opinion that the damage was caused by the railway. Mr. Freeman, for the defence, said this was the first practical claim for damage brought against the company, and they were prepared to submit a large body of evidence to back up the defence. It was impossible from an engineering point of view that the damage could have been caused by the construction of the railway, which was 64ft. below the surface of the road. The house, which was 40 years old, had been built on the remains of a water-brook, and there still remained a large deposit of mud, with an unstable substratum. Moreover, the bursting of a water-main in 1897 had undermined the foundations, and it was quite possible that this was the cause of the damage. The hearing was adjourned provisionally until February 8th.

Carrying Out Drainage Work Without Authority.—At the Clerkenwell County Court recently William Thomas Ballard, a builder, claimed from W. Parker the sum of £22 19s. 9d., work and labour done and goods supplied. The defendant had filed an affidavit in which he denied being indebted to the plaintiff in the sum of £46 6s. 9d., alleged to be due for certain drainage and other work done at Nos. 1 and 2 Albert Villas, Archway Road, of which premises he was the owner. He did not authorise the work at the premises, as no drainage work was required there, and any work of that kind which might have been done was done on the plaintiff's own responsibility. Counsel for the plaintiff explained that the defendant was served last August with a notice by the sanitary authority requiring certain work to be done. The plaintiff was instructed to carry out the necessary work and did everything that was necessary. Defendant said that, up to the time he returned home on August 27th, he had heard no complaint about the drains to house No. 1. The drains had been set in concrete, cemented, and everything done to make them sound and secure about six years before. On his return he went to house No. 2, and was astonished to find that the main drain was up, as he had no intimation of what had taken place. Plaintiff took him to No. 1 and said the drains were all affected, but that witness denied, as he had them set in concrete, with new closets and the drains properly trapped by eminent sanitary engineers. Whatever had been done there by the plaintiff was without witness's knowledge or consent, and he told him he was astonished he had turned the drains up. The Judge said the case illustrated that if a person received an order to do specific work he ought to have it in writing, or supported by the strongest and cleverest evidence, or landlords and occupiers of houses would incur very heavy expenses. He was glad in this case that the representative of the sanitary authority had not been a party to anything of the kind, and had not lent himself in any degree to it, but had communicated what was said by the plaintiff in his presence. He could not help saying that the evidence given by the plaintiff was discreditable to him as a tradesman. He told them in the most precise manner that in the presence of that gentleman (the inspector) and another gentleman that the drains of house No 1 were exposed, and that they condemned them because the water test having been applied it was found they were defective. They found that the officer of the authority had never tested the drains nor expressed an opinion that they required to be re-laid. He gave a verdict for the defendant, with costs.

Water-Closets for Cottages.—At Newton Abbot last week Henry Hamlyn, of Chudleigh Knighton, was charged with two breaches of the building by-laws. The first charge was that he varied the plans of cottages after they had been approved by the Council; and the other was that he permitted the houses to be occupied without first obtaining the usual occupation certificate. Mr. Horner (for the Council) stated that early last year a Mr. Segar submitted plans for the erection of four cottages at Chudleigh Knighton. These plans were approved on March 21st. They provided for the construction of earth-closets, but the plans were not adhered to, and water-closets were constructed. Owing to this the Council declined to grant the occupation certificate, but the houses had been occupied. There was no water nearer than 54ft. for flushing purposes, and separate flushing cisterns had not been provided. H. B. Mapleton, medical officer of health, stated that for flushing purposes there should be five gallons of water for each person per day. The closets were hand-flushed. All hand-flushed closets were suspicious, and probably dangerous. For these houses, under all the circumstances, water-closets were eminently unsuitable.—Cross-examined: He did not know that water-closets were enforced in another part of the same village. He had never known a case of disease from a properly constructed earth-closet. He thought hand-flushed closets a greater evil than earth-closets. "If we disconnect with the sewer, take out the pan, and put in a bucket, you think that will be a sanitary improvement?" "Certainly." Defendant's solicitor said he was not there to find fault with the district councillors, who were guided by the judgment of their officials. But he complained that defendant had never had any notice that there was any fault to be found with the water-supply of the house. If a better water-supply was necessary the time to order it was when the plans were before the Council for approval. But then nothing was said about it. As to the variation of plans, defendant had acted for the best. If he had wanted to save his own pocket, all he had to do was to put in the earth-closets as shown in the plans, but he wished to make the houses as healthy as possible and so went to the expense of providing trapped cottage water-closets. Mr. S. Segar, architect, thought the alterations in the plans a great improvement. While he was sanitary inspector, old earth-closets were abolished at the chapelry in the same village, and hand-flushed closets were provided for four houses at Bickington several years ago. He did not call the closets in dispute water-closets. They were hand-flushed water-closets. Mr. Horner: What is the difference? Witness: Hand-flushed closets are better as the flush is greater. The Bench convicted in both cases, fining defendant £1 and costs in each, and also imposing a penalty of 1s. a day until the by-laws were complied with.

Correspondence.

Cockington Church, Devon.

To the Editor of The Builders' Journal.

Fair Park, Exeter.

Sir,—Referring to Mr. Josias C. Beare's admirable sketches of Cockington Church, published in your issue for last week, and his accompanying description, the latter, as referring to this church, is unwittingly a little misleading in one particular.

I remember, a great many years ago—certainly twenty-five—seeing an apparent young architect, in genuine artistic tourist get-up, busily engaged in sketching a certain cresting in the choir of Exeter Cathedral. As I passed him I said quietly, "I should not draw that if I were you: there's much better here; that is hardly worth the trouble." "And pray what do *you* know about it?" was his retort, in a tone of professional contempt that could only have been attained by a four years' articleship to some architect with a prominent name. "Well," I replied modestly, "only that I carved it *myself* three years ago!"

Much the same may be said of the font cover in Cockington Church. Only the lower portions are actually old. There was nothing existing four years ago to show what the top was like, so, taking as my *motif* some of the few stationary font covers of about the same date to be seen in the eastern counties, I made the upper part, as is now shown in Mr. Beare's careful drawing.

A story went the round of some professional and other papers a while ago to the effect that the old oak used in Cockington Church was so hard that no ordinary carpenter's chisel or saw would touch it, and the only way to cut it at all was by using the local blacksmith's drill. Having been personally more or less connected with the church in question for fully thirty years, I of course knew the statement to be utterly without foundation. Meeting my old friend, the Rev. James Henning, the present genial vicar, soon afterwards, I asked him however he could have allowed such a ridiculous story to get about. Silently he winked one eye, and then replied apologetically: "Well, I only repeated what the workmen themselves told me!" Cockington Church is dedicated to the respective honour of SS. George and Mary: there is only one other in England of similar dedication.

At this period of national sorrow the following may be of interest. When the two royal brothers the Dukes of Clarence and York were studying on board the *Britannia* at Dartmouth, about nine miles distant, one day, out on a walking trip, they visited Cockington Church, and on leaving, boy-like, cut their names upon the stone jambs on the east side of the south-west porch. The then vicar was quite indignant, and had the lettering erased. I thought then, and still think, his judgment was as regrettable as it was rash.

In my copy of "Rough Notes" on the Deanery of Ipplepen (published in 1848) the following particulars relative to Cockington Church occur, and may be interesting:—"Chancel 15ft. 7.n. by 12ft.; poor screen, complete with parclose and doors; three-light east window; three-light south window containing figure in glass with sword, the monogram of the Virgin over it; mutilated piscina; decalogue supported by figures of Moses and Aaron; nave 42ft. long; five Perpendicular piers and arches; stove in the midst; carved oak pulpit with niches gilt. North aisle and transept 33ft. by 14ft. 6in.; south aisle 33ft. by 11ft. 5in.; five arches, capitals foliated. At east end a pew with fire-place. West tower of two stages with diagonal buttresses, embattled parapet and low pinnacles. West arch open to receive singers' gallery. The entrance is from the west by six steps of descent. Font of freestone, Perpendicular, with shields and arms, situated at the north-west end of nave: it has the remains of a brass inscription around the upper moulding, with the name of Carey, whose arms also occur."

It will be seen by this that no mention is made of any font cover. Indeed, when I first found the panels they were lying about the church, and no one apparently had any idea what had been their original use. Curiously they are not in oak but of deal. There is very little old work of the latter material existing in Devon.

But to continue the "Rough Notes":—"South-west porch converted into vestry; donation tables placed within, also an old chest. The south door is locally known as 'the confessional.' This very interesting little Perpendicular church is of somewhat early date; indeed, some of the features of the tower appear to be a century older. The position of the porch, too, in the West Country is an early feature. The site, in the midst of the manorial domain, is extremely beautiful."

I have only to add that Cockington, as Cockington, no longer exists. The borough boundary of the neighbouring fashionable watering-place has recently been extended, and Cockington to-day is simply a suburb of Torquay.

Yours truly,

HARRY HEMS.

Payment for Overtime.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The query answered on p. 478 of your issue for January 23rd raises a much-debated point, and one which provides the *raison d'être* for much diversity of opinion, if not a little dissatisfaction. Upon a broad basis it may generally be set down—in the absence of any specific agreement to the contrary—that a man who works by the hour is entitled to payment for overtime, whilst he who works "by the week" at a settled wage has no claim for extra payment for work done after the usual working hours.

This, on the face of it, may seem somewhat unreasonable; yet I do not think it will be found so upon investigation. The employment of the man who works by the hour is uncertain and erratic; he is engaged at a moment's notice; an hour's warning terminates his engagement. On the other hand, the man who works by the week has a certain continuity of employment, and being entitled to greater consideration in the matter and mode of its termination should be prepared to yield some consideration to his employer in return. Again, a weekly servant (and the term "weekly" may be taken to include those who receive their salary monthly) has the advantage of the "hour man" in that holidays—public or annual—entail no loss of salary, and no deduction is made for lost time by late arrival owing to railway disorganisation, or by reason of temporary absence through indisposition; and it is generally not a troublesome matter to get a few hours—or even an occasional day—"off." For these advantages to the employee the employer naturally expects that his convenience shall be studied in return, and although in some offices it is the custom (rare though) to pay for overtime, or, in some others, to grant an allowance of 6d. or 1s. per head as "tea money," in the majority of cases it is expected that, if the exigencies of work require it, such overtime as may be necessary in order to cope with sudden pressure of work, or emergencies of any description, shall be worked without any extra remuneration being forthcoming. It is, of course, very annoying to be kept late at the office unexpectedly, especially when such detention may mean the upsetting of some carefully-planned arrangement; but "what can't be cured must be endured," so one has to make the best of the disappointment.

The foregoing presupposes the necessity for only occasional overtime. When the necessity becomes chronic it indicates understaffing, and the disease being readily diagnosed the application of the remedy is easy. But if for any reason an increase of staff is inexpedient, an increased remuneration may reasonably be expected, and is generally recognised as a valid claim. Yet, it is very very doubtful if an assistant could *enforce* payment for overtime. In the absence of any specific agreement it is necessary, for legal purposes, to prove "custom"; and if asked what is the custom I should say most decidedly that it is *not* to pay for overtime. True, an assistant cannot be made to stay beyond the usual office hours, that is to say, there is no legal machinery to compel him to remain; but if such a refusal was met by an application of the closure, an action for damages for wrongful dismissal would have little chance of success.

Before leaving the subject, however, it must be freely admitted that the overtime question is a burning one in many offices where staying beyond hours is the general rule for at least half the evenings of the week. Such cases prove understaffing, or bad management, or a blend of both; and if a courteously worded request for extra payment is met with a blank refusal, the remedy is either a little trade unionism among the assistants, or a perusal of "situations vacant" and as speedy a change as possible. But there is such a thing as "getting out of the frying-pan into the fire."—Yours truly,

H. E.

Quarry Notes.

A Jail as Quarry.—For some time prisoners at the county jail at Doylestone, Pa., U.S.A., have been compelled to break stone, but now that the stone at the jail has given out the prisoners will be compelled to quarry a new supply. They are shackled and guarded while at work.

An American Quarry Incline.—The contracting firm of Drake and Stratton state that the incline they have just built for the Conemaugh Stone Company, near Johnston, U.S.A., is one of the most remarkable in the world. It is 1,475ft. in length, and the grade is 52ft. to the hundred, so that the plane is almost vertical. By means of this incline stone will be lowered from the high levels of the hills to the Pennsylvania railroad. Five cubic yards of stone in huge blocks can be lowered at a time.

Foundations at Amsterdam.—Amsterdam was originally a salt marsh, and in order to make a foundation for houses it was necessary to drive large piles of wood, or rather masts, through a layer of peat, which in some places is said to be 40 or 50ft. thick. The nature of the soil may differ somewhat in different parts. The following facts will show still better its character. In 1605 a well was dug in one of the hospitals of Amsterdam (Oude Mannen-en vrouwen Gasthuis) to the depth of 232 Dutch feet. After 7ft. of earth there were found 9ft. of peat, and then soft clay, sand, earth, clay rather hard, and earth, altogether making 51ft. of depth. Then came 10ft. of sand, in which stratum the piles of Amsterdam chiefly rest. At the depth of 70ft there was found 1 ft. of pieces of peat. Sand, through which they did not make their way, was found at the depth of 232ft.

Polished Granite.—The question of polishing carved work in granite is one on which there seems to be a considerable divergence of opinion. The French sculptors and archite seem to have but one opinion in the matt and that is, that if the ground of an archite tural detail or monument is finely dressed a left unpolished, the enrichment should treated in a like manner; but if the monume is polished at all, it should be entirely Many workers in granite consider that a co bination of plain and polished work is by the most effective from a decorative point view. A spray of foliage or other orname carved in relief, certainly, has its conto emphasised by a polished background, t darker surface throwing the carved enrichme into prominent relief. The light and shade delicate carving is almost killed if the work polished; but a feeling prevails in France tl although this is so it is better to have monument of one uniform tint than to hav combination of the polished and unpolish stone.

Durability of Slates.—Mr. Larivière ma a communication on the determination of t porosity and durability of slates when expos to the influences of weather to the Commissi of Testing Methods for Building Materia established at the French Ministry of Pub Works recently. It is difficult, he says, to d termine the porosity, because as a rule schi are but slightly porous, and because care mu be taken not to confound the water between t layers of cleavage with the water really co tained by the pores of which these layers a composed. As a rule we may say that t duration of a slate seems to depend upon t proportion of carbonate of lime and pyrite contains. Crystallised pyrite is less i jurious than that disseminated througho the substance, the existence of which often only revealed by the general d composition which finally takes place. Pr fessor Brunner, of Lausanne, recommends t following method, taken from Fresenius, easily and rapidly estimate the quality slates:—Take a sample of slate 7 by 3 cen metres and hang it by a cotton thread in glass vessel containing 100 cubic centimetr of water saturated with sulphurous acid in su a manner that the slate will not dip into t liquid, then shut the glass and keep it in ordinary temperature. Bad slate decompos in a few days or even hours, becomi exfoliated; if it remain compact, it will gr very friable and spongy. Good slate w preserve its primitive state for four to s weeks. A superior quality of slate has sign of decomposition after several month This rapid decomposition of bad slate is d to the presence of pyrite, carbonate of lim and magnesia. The pyrite is transformed in sulphuric acid, which decomposes the oth minerals. The carbonate of lime is tran formed under the influence of humid air a carbonic acid into soluble bicarbonate.

Masters and Men

The Building Trade Dispute at Coventry sti continues. The proposed reductions in wag are: for bricklayers and carpenters, from 8¾ to 8d. an hour; plumbers, from 9d. to 8½d painters, from 8d. to 7½d.; and labourers, fro 6d. to 5½d.

Stone Quarrymen's Strike.—The men em ployed at Shire Hill and Lees Hall Sto Quarries, Glossop, are on strike owing to refusal by the quarry master to grant an a vance of about 20 per cent. in wages to skille workmen and ½d. an hour to labourers.

Aberdeen Plasterers' Wages.—A speci meeting of the Aberdeen Branch of the Scottis National Operative Plasterers' Federal Unio last week considered the employers' notice of reduction of wages to the extent of 1d. pe hour, which comes into force on February 24t On a vote being taken, it was unanimousl agreed to adhere to the present rate of wages.

A Memorial to the Late Bishop of London proposed to be erected.

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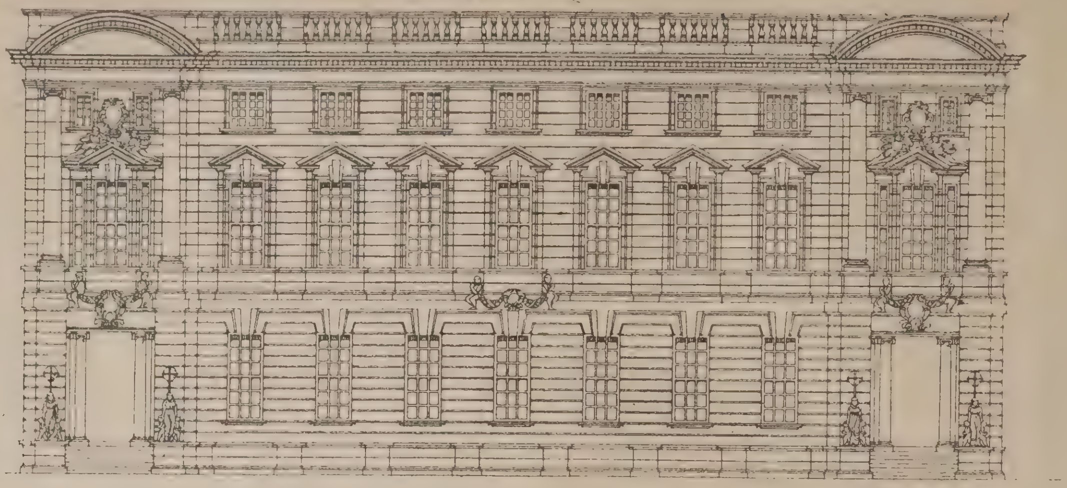
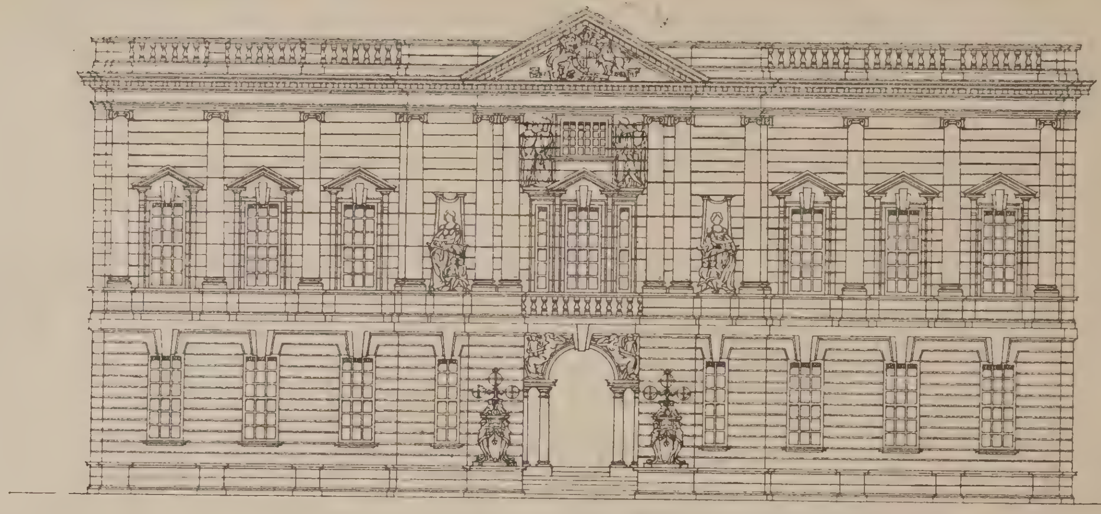
Wednesday, February 6th, 1901.

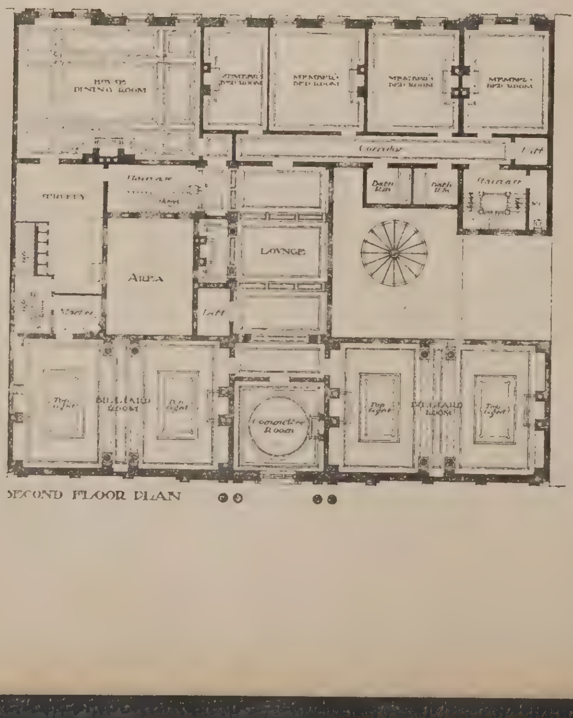


ELEVATION TO BACK STREET

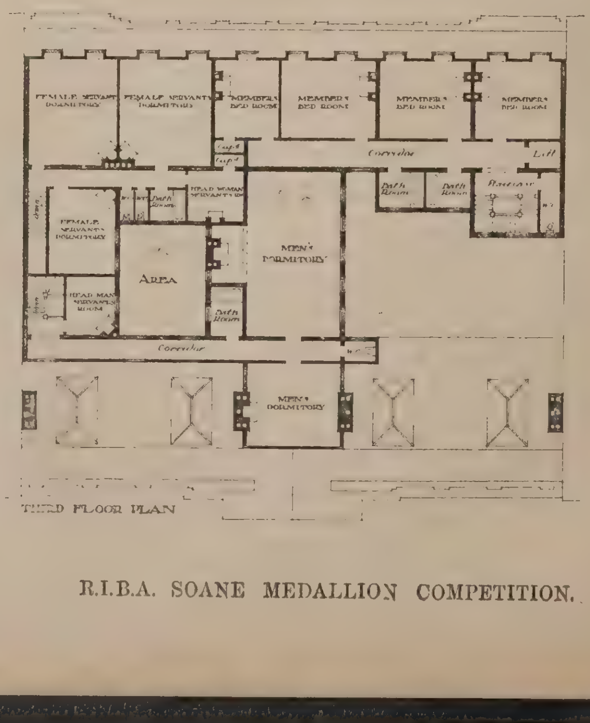


ELEVATION OF PRINCIPAL FRONT

Scale of Feet

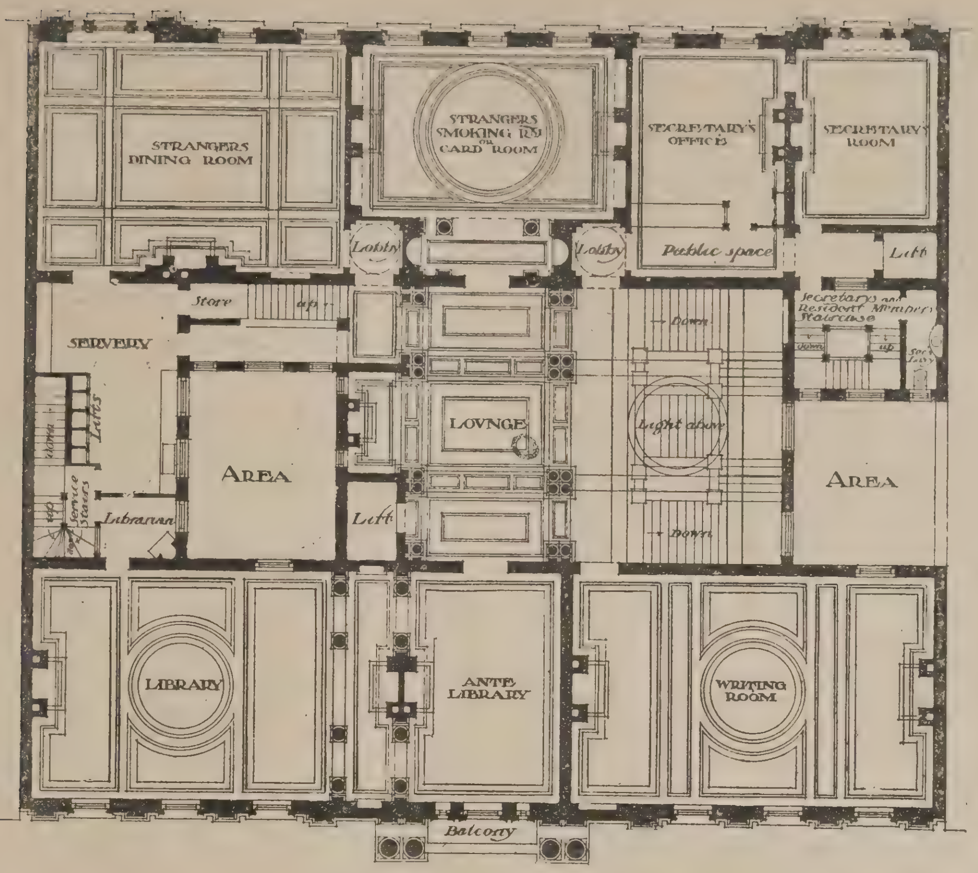


SECOND FLOOR PLAN



THIRD FLOOR PLAN

R.I.B.A. SOANE MEDALLION COMPETITION. DESIGN FOR



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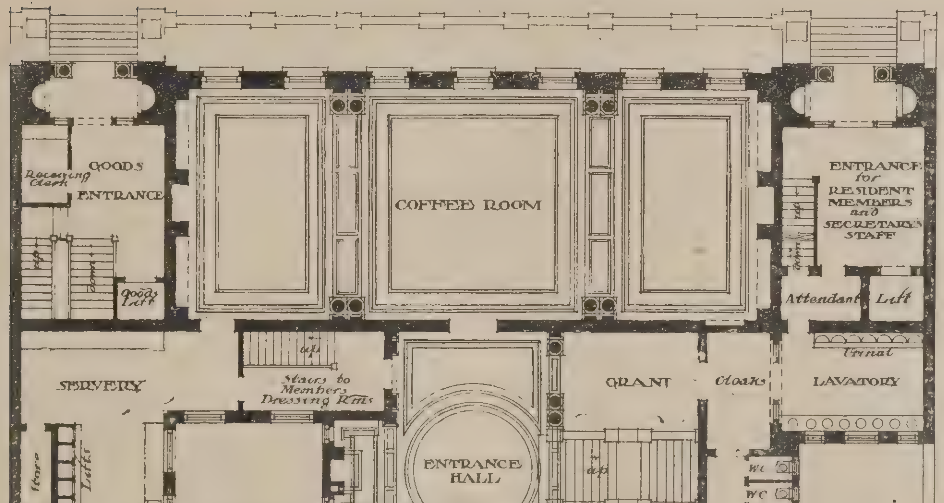

GROVND PLAN

LUB HOUSE IN A LARGE CITY. By H. MUNRO CAUTLEY.

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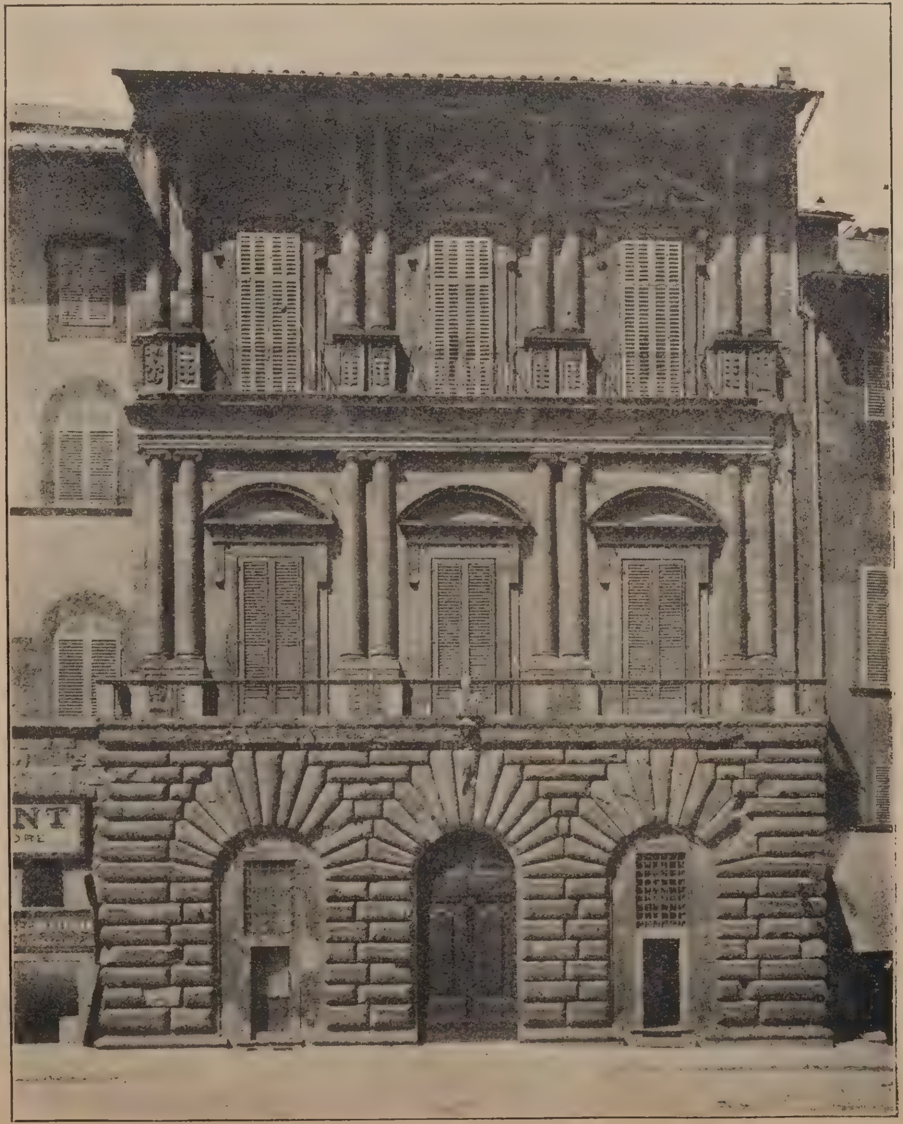
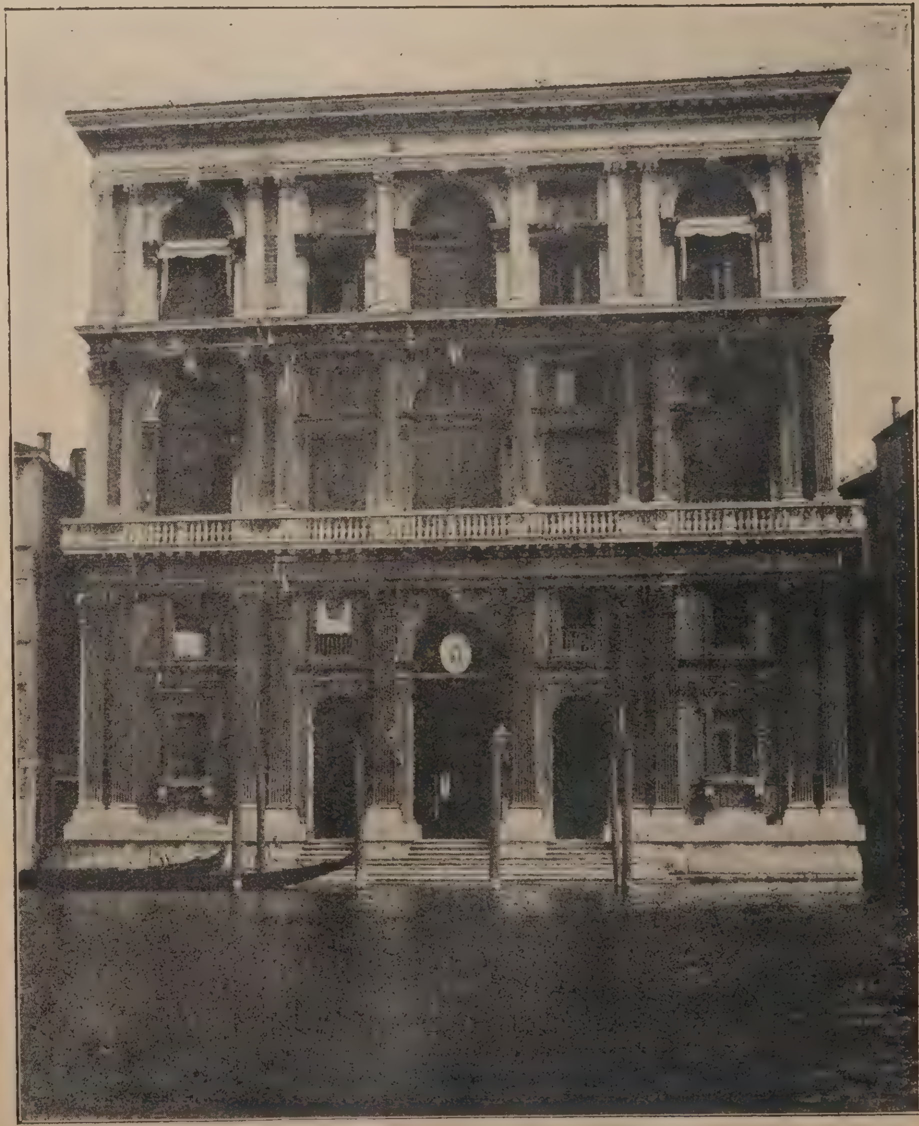


PALAZZO UGOCCIONI, FLORENCE.
FOLFI, Architect. Date 1550.
Shows the use of double columns between the windows.



PALAZZO GRIMANI (CORTE D'APPELLO), VENICE.
Chief work of MICHELE SAMMICHELI. Date, 1549.
Shows the use of both columns and arches.

(Illustrating "An Architectural Craftsman's Visit to Italy," by Professor Gourlay.)

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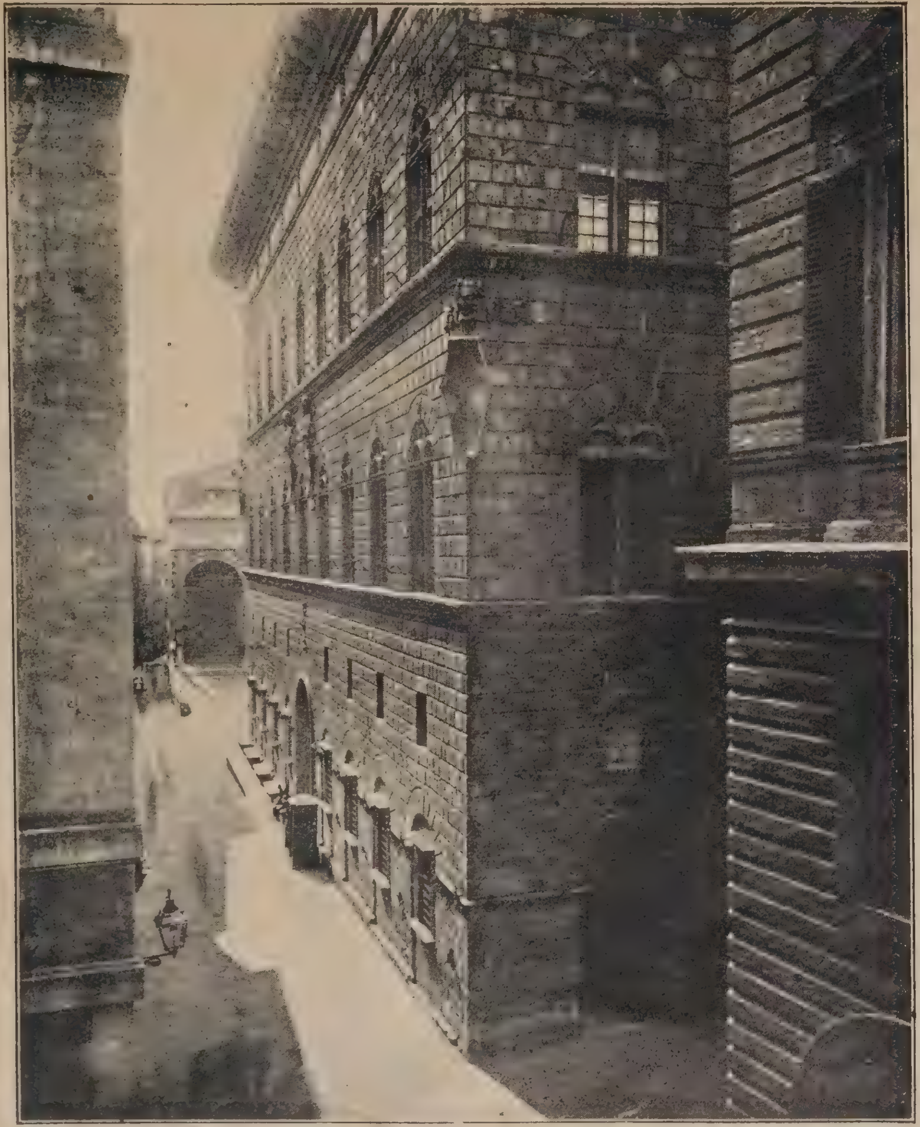
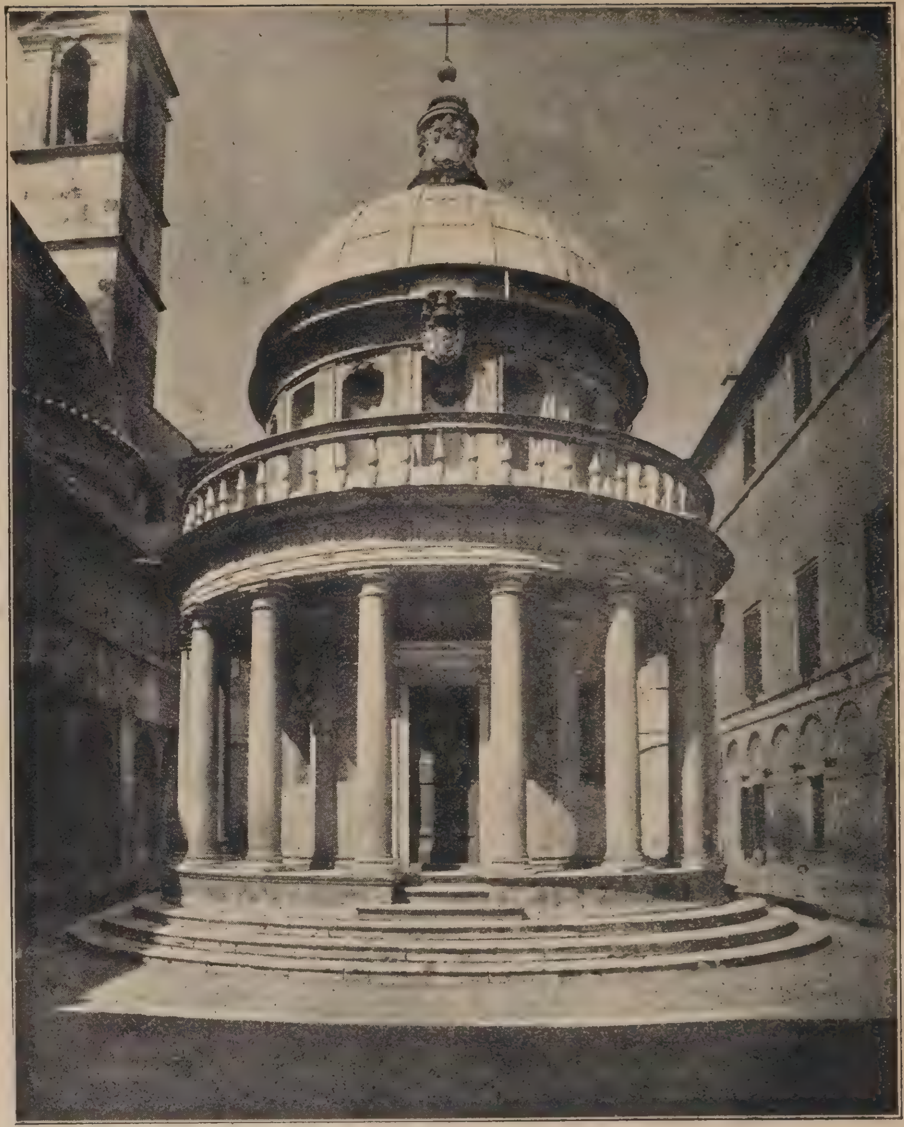


PALAZZO DEL GOVERNO, SIENA.
Erected 1469-1500, probably by BERNARDO ROSSELLINO.
The façade has no columns, *i.e.*, it is "astylar."



CHURCH OF S. PIETRO IN MONTORIO, ROME.
BRAMANTE, Architect. Date, 1499-1502.

(Illustrating "An Architectural Craftsman's Visit to Italy," by Professor Gourlay.)

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Bricks and Mortar.

APHORISM FOR THE WEEK.

Time's glory is. . . .
To ruinate proud buildings with thy hours,
And smear with dust their glittering golden
towers.—SHAKESPEARE.

Our Plates. PARTICULARS of the Italian buildings illustrated will be found in the article on "An Architectural Craftsman's Visit to Italy," which is printed on p. 2 of this issue.—The Soane Medallion and £100 was not awarded this year by the Institute, but three competitors were awarded thirty guineas each for their designs. Mr. H. Munro Cautley, of Westerfield, Ipswich (whose design we reproduce), was one of the three.

Smoke. SIR WILLIAM RICHMOND has addressed a letter to the secretary of the London School Board on behalf of the Coal Smoke Abatement Society in which he remarks that many forms of grates and stoves are already on the market which are designed to materially reduce the evil of imperfect combustion, and he suggests that wherever occasion arises the Board should specify for some form of these apparatus to be used in its buildings. "Such an example set by so influential a body could not fail to have a most salutary effect, and be of the utmost assistance to the Society in its work." A similar suggestion has been made to her late Majesty's Government, and has been received by them with a promise to put it in operation without delay and whenever possible, and even to furnish facilities for trials in order to ascertain the best form of grate for the purpose. The committee therefore trust that the Board may be induced to take their suggestion into the same favourable consideration, and so materially help forward the work of checking a great and crying public evil.

English and German Monuments. BISHOP WILKINSON writes to the "Daily News" from St. Malo on the subject of national monuments, many of which will doubtless be erected when the war in South Africa is at last concluded. He suggests that we should not be content, as hitherto, "with inartistic square stones, and uninteresting obelisks bearing the names of the gallant men who have died fighting for their country. Let the national instinct be recognised by all means, even in death, but utilised and lifted up into a great national beacon, as in Germany, by the overshadowing of some such works of art and beauty as are sown so widely and wisely over the German Empire. For instance, the Germania National Monument which looks across the Rhine to the hills of Lorraine, and full upon the earlier battlefields of the Franco German war, delivers its message and lesson to every young German lad and boy who is, or hopes one day to be, a soldier. Upon the front of the basement stands a colossal bronze relief of German crowned heads and generals who fought the battles recorded thereon in 1870; the Emperor William on horseback being, of course, the central figure in the brillant group. Beneath are five stanzas, opening 'Es braust ein Ruf wie Donnerhall,' which no one can read without owning it to be a war-cry, the Donnerschlag, of a great people terribly in earnest. On the sides of the stone plinth are two very telling bronze groups, carrying life-sized figures. . . . The German mother giving her boy his sword, and buckling it round his waist, is not very easy to look at with clear eyes if there be any heart beneath them. It is the good, sound, loving home-life of these Germans that makes them such fine soldiers, such a great, united, strong people. . . . The memorial at Coblenz is alone worth a journey from England. The next in magnitude and power, perhaps, after the Germania. It stands at the confluence of the Rhine and Mosel. The Emperor on horseback. It is war-horse led by the Angel of Peace. The victorious Kaiser returning to Berlin inclines his head to Ehrenbreitstein, and seems to salute the fortress. . . . The position is unique, the work grand, costly, massive and charged with life and teaching beyond all power of description. I have been thus diffuse over these two superb monuments to show how much Germany makes of these things, and what enormous sums she freely lavishes to teach her sons what war means . . . That we are so miserably poor in such monuments—indeed, absolutely without them—is nothing less than a great national loss. What an opportunity now, above all other points in our national history, to create such, and so commemorate British and Colonial brothers falling side by side on the far South African veldt in a cause common to the Empire. The art, poetry, teaching of such monuments have a tremendous influence upon national life and character, and we cannot afford in these days, when we must of necessity become a military as well as a naval power, to undervalue or neglect such influence."

Another aspect. THE Bishop's remarks have not passed unnoticed. One correspondent points out that the monuments erected in Germany described by him are not "war" monuments, but monuments commemorating the birth of the Empire and the nation. "Many Germans regret that this, the grand poetic idea, has not been made dominant, and that the prominence has so often been given to the warlike aspect. We in England should be very sorry to see huge monuments erected in memory of wars fought in China, the Soudan, and in South Africa." Another correspondent, who writes under the *nom-de-plume* of "A Brother of Mankind," and says he is not a bishop, remarks: "Is there not pandemonium enough in South Africa at the present moment but that we must prostitute the sculptor's divine art to the 'creation' of such hideous satires on the Sermon on the Mount?"

The Land Registry Office. IN a recent issue we drew attention to the proposal to bring forward the new offices of the Land Registry in Lincoln's Inn Fields (60ft. high with two storeys in the roof) to such an extent that it would project into the forecourt 28ft. At last week's meeting of the Council of the City of Westminster the Improvement Committee reported that they had received replies from His Majesty's Office of Works and from the London County Council in reply to the Council's protest against the suggested encroachment. The former replied that there was no intention of building over the existing forecourts. The London County Council stated that after considerable negotiation the First Commissioner would be prepared to keep back the proposed building line so as to align with the portico in front of the Royal College of Surgeons, and to surrender the building site of the existing one-storey building and convert it into an uncovered forecourt. A recommendation was adopted accepting this proposal.

Clergy and Artists' Association. The annual meeting of this association was held last Thursday, the Rev. Canon Lonsdale Ragg presiding. Amongst those present were the Dowager Countess of Darnley, Mr. E. S. Prior, the Rev. J. Eymes and the Rev. J. Bloxam. Before the business was proceeded with a resolution was adopted expressing sorrow at the death of her Majesty the Queen, and expressing sympathy with and loyalty to King Edward VII The object of the association is to enable the clergy and others to approach artists more directly, to form a centre where examples of artists' work executed in churches and buildings may be seen, and information given generally concerning their work. A further object is to undertake through its members decorative work in churches, to restore individual character to art in churches, and to counteract the evils of delegated work and of commercial and mechanical production. To use the words of Mr. W. Holman Hunt, the association is opposed to the "vulgar stained glass, and stereotyped and feebly-executed Gothicisms in churches of decorative pretensions," which "scandalise the nature of our faith." Decorations in the nature of "dead symbolism" are objected to, and the desire generally is to create a healthier and a living interest in the art-work of the day in the churches. No commercial object enters into the conduct of the association. The report, which was read by Mr. Reginald Hallward, hon. secretary, recorded the withdrawal of some of the members during the year, and, while this was regretted, the association was now all the stronger by the fact that the members were undivided in their aim, and took a deeper interest in the work to be accomplished. The exhibition held in connection with the Church Congress at Newcastle compared favourably with those previously held. These art exhibitions would now be a permanent feature in future congresses. Twenty-six new members had joined during the year. The income of the association for the year was £104 12s., and its expenditure £106 14s., and there remained a deficit of £33 16s. In moving the adoption of the report the chairman said the association did not seek for popularity, but rather to exert a very real influence in the matter of art in our churches. The report having been adopted and the officers re-elected, Mr. W. Bainbridge Reynolds read a paper on "Metal Work in Church Art."

Remarkable Babylonian Discoveries. MR. W. ST. CHAD BOSCAWEN gives a description in the "Times" of one of the most remarkable Babylonian inscriptions ever discovered, which has been recovered by the French expedition working at Susa under M. de Morgan. During his expedition of exploration to Susa in 1897–98 M. de Morgan discovered in the citadel mound at Susa the remains of several successive settlements and at least two ancient cities upon the site. The lower settlements, with extensive deposits of flint tools, maces and sickles, belong to the prehistoric age, although the finely-worked and decorated pottery and brickwork indicate some considerable progress in civilisation. In the last of the cities, which was evidently the Anzanian-Elamite capital destroyed by the Assyrians in B.C. 640 by the campaign of Assur-banipal, the explorers found the remains of Elamite palaces and temples which had been burned and destroyed; but more important still was the record chamber, in which were many inscribed monuments, bricks, cones, etc. Among the most important was the fine stela of victory set up at Sipar, in Elam, by Naram-Sin, the son of Sorrgon I., B.C. 3750, which had been removed defaced, and reinscribed by the Elamite Conqueror Sutruk-Nakhunte in B.C. 1400. The discovery of bricks inscribed with his name prove his occupation of the city. Here, also, were found inscriptions of Khammurabi B.C. 2200, who also claims to have conquered Elam. The largest and most important monument discovered is a granite obelisk 1·40 mètres in height, covered with an inscription of no less than 76 columns of extremely archaic writing, of the type of the earliest monuments from Tello and Nippur, and amounting to nearly 2,000 lines or packets of writing. On the ground of the writing alone this inscription may be assigned to an age as remote as B.C. 4500, and an examination of the contents of this inscription proves this estimate to be accurate. The monument is really a terminus or boundary stone. In the body of the inscription mention is made of "Mesalim, the son of the King." This is the same person who, "as King of Kish," took part in the frontier demarcation with Eannadu, King of Sirpurra, recorded on a clay cone in the Louvre, whose reign is about B.C. 4500, and the presence of the name of Urkagina patesi of Sirpurra among the official names mentioned is another confirmation. The importance of the inscription however consists in the astonishing evidence it affords of the advanced stage of Chaldean civilisation even at the remote age of B.C. 4500.

ARCHITECTURAL ACOUSTICS,

SYMPHONY HALL, BOSTON, U.S.A.

THE new Symphony Hall which is to be the home of the Boston Symphony Orchestra, is, perhaps, the first building ever erected whose acoustic properties were not, during the planning and construction, very largely a matter of mere guess-work, says the "New York Sun." Long before the walls were up it was known with great accuracy what the acoustic qualities of the auditorium were to be, and the architects proceeded with their work in entire confidence that the acoustic principles to which they were adapting their plans were scientifically sure.

This certainty on a point so long considered almost hopelessly uncertain was due to the investigations of Wallace C. Sabine, assistant professor of physics at Harvard University, who has been engaged in studying the subject of architectural acoustics since 1895, when he was asked by the Harvard Corporation to remedy the acoustic defects of a college lecture-room. Preliminary study of the problems involved led to a complete examination of the whole subject, culminating in the notable work done on the new Symphony Hall.

It has been a popular impression for a long time that acoustics practically applied was nearly, if not quite, a hopeless problem. People have seen a hall which was acoustically good, copied, as they imagined, exactly, with a result which was a total failure, and, very naturally perhaps, they have come to believe that the whole subject was beyond control. Books on acoustics abound in inconsistencies. One writer says that the dimensions of a perfect music hall should be as 2 to 3 to 5; a second, as 1 to 1 to 2; and another, as 2 to 3 to 4. The whole matter, popularly and scientifically alike, has been in a state of confusion.

But as a matter of fact, the difficulty has been a lack of study and therefore of understanding of the various details that influence the acoustic properties of a public hall, and this lack the Harvard investigations have gone far to supply. It is now known that the acoustic quality of one hall will be exactly duplicated by that of another, if the second is built exactly like the first, only the model must be followed in every way—in material, proportion and arrangement. Nothing can be varied, not even the slightest detail, without varying the acoustics also.

Of course, it is almost impossible to make one hall a mere facsimile of another. New methods of construction or ventilation, a thousand details, in a word, will cause a greater or less variation. But it is now possible to calculate the effect of all these changes, and by making still other compensating changes to retain the special values of any auditorium that one may have chosen to take as a model for good hearing.

Symphony Hall is a case in point. The architects, McKim, Mead and White, of New York, at first prepared plans for a building along Classical lines, and Mr. McKim visited Europe for the purpose of consulting with scientific authorities in France and Germany. It was finally decided that a Greek theatre as a music hall would be too dangerous an experiment in acoustics; and it was first decided by the committee to follow the general proportions and arrangement of a well-known auditorium, the Gewandhaus, in Leipsic. But the seating capacity of this hall, only about 1,500, was too small, and the plan had to be abandoned. The new hall, with its two galleries, its stage recess, its sloping floor, and, above all, its increased seating capacity, is a copy of the old hall only in certain acoustical results, and not in the architectural means by which these results were attained. The Boston hall contains about 175,000 cubic feet more than the one in Germany; yet, owing to skilful calculation and careful balancing, the reverberation of the former, as expressed in the formulas prepared at Harvard, is 2·31, against 2·30 for Leipsic.

The investigations at Harvard have embraced practically every detail of architectural acoustics, and have been carried on with a minuteness and a patience astonishing to the layman. Not only have the more obvious problems been studied, but calculations have been made to establish the acoustic differences between a room containing a small audience and the same room when completely filled; and something has even been done toward establishing the effect of plants when placed in an auditorium. The three essentials of a good music hall are, of course, fairly obvious: the sound from the stage should be sufficiently loud; the component parts of a complex sound must keep the proper balance of intensity; and a succession of sounds must come out distinctly, without confusion among themselves or from without. The problems arising on all these points have been carefully worked out, although the results of this study have not yet, in all cases, been fully tabulated.

In the important matter of reverberation, however, a most interesting statement has been made, with particular reference, aside from the purely mathematical treatment of the subject, to the qualities which various objects have of absorbing sound. Sound is one form of energy, and can be changed into any other form. Usually it passes into heat. This process of decay, as it is called, is known as absorption; and sound is absorbed, more or less, by any substance with which it comes in contact.

Reverberation is sufficiently well understood. An echo is a special example of it, but the more general sort of reverberation is a confused mass of sounds, as it were, which, unlike an echo, is incapable of being analysed into its various parts. Reverberation has spoiled many a public hall, but on the other hand a certain amount of it is not only not too objectionable but actually desirable in a good music hall. In the ordinary theatre, where reverberation is reduced to the lowest practical limit, an orchestra like the Boston Symphony would sound muffled and dead, as compared with a performance in a hall like its present one, where the conductor, Mr. Gericke, demanded, in order to obtain the best results, that the architects should not eliminate the reverberation below a definite limit.

The use of various materials as absorbents of reverberation, therefore, and the calculation of the effect of each, is one of the most interesting problems of acoustics. The lecture-room in Cambridge (U.S.A.), where the present experiments were begun, was so exceedingly slow in absorbing sound that a word spoken in an ordinary tone of voice was audible five and a half seconds after it had been uttered. During this time even a very deliberate speaker would have uttered a dozen or more succeeding syllables. These successive enunciations were blended into a loud noise, through and above which it was necessary to distinguish the orderly progression of the speech. This could not be done across the room, and even near the platform the effort to listen for any length of time was wearisome. By bringing into this room about 1,500 cushions from the seats of Sanders' Theatre, in Memorial Hall, and arranging them so as to expose the largest possible surface, the length of reverberation was reduced to 1·14 seconds—or about a fifth of what it had been before. The cushions had absorbed the rest of the reverberation.

In calculating absorption an open window is taken as the unit, since it makes no difference whether sound escapes into the open air or is transformed to heat in some substance, and an equal area of any other material is compared with this unit as a standard. The absorption of glass, for example, is thus expressed by the fraction of 0·025, and of pine sheathing by 0·061. More curious are the figures of persons, or for an audience *en masse*. A woman absorbs more than a man for the reason that her dress offers a greater surface. For the same reason a person sitting in a scattered audience absorbs more than he would if he were one of a crowded audience. An audience is reckoned as a bounding surface, like a floor, in these calculations, and its area is measured in metres. Here is a table of comparative values:

Audience per metre	0·96
Audience per person	0·44
Isolated woman	0·54
Isolated man	0·43

To give still another example, a settee upholstered in hair and leather has a value of 1·10, while a plain settee of ash is only 0·039.

Without attempting to go into the other branches of this novel enquiry, it will be easy enough to see how the Harvard investigations have raised architectural acoustics to a position it never before held, and made it, as in the new Symphony Hall, a trustworthy science.

New Patents.

These patents are open to opposition until March 14th.

1900.—Glazed Bricks.—225. M. F. Solon, Rushton Road, Cobridge, Staffs. Finely-powdered marl is pressed in a die, removed, dusted over with finely-ground earthenware or stone clay, pressed again and fired. After firing it is dipped into a solution of glaze and fired again. It is claimed that glazed bricks can be produced in this manner at considerably reduced cost.

Air-Moistening Apparatus.—4,721. J. V. Musgrave, 33 Legram's Terrace, Listerhills, Bradford. This invention relates to an apparatus for moistening the air in workshops and factories. It consists of a combined air and water jet. The air jet is fed under considerable pressure, and opens close to the water jet at such an angle that the water is reduced to a fine spray, widely diffused by the force of the current.

Skylights.—16,166. E. Reiss, Kaiser-Wilhelmstrasse 35, Düsseldorf, Germany. Instead of opening at one end, the skylight consists of three hooded frames connected by levers, so that the whole can be lifted bodily. The frames are fixed one above the other, and the top one is glazed.

The following specifications were published on Saturday last, and are open to opposition until March 16th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—338, Czerny and Schlimp, kilns for firing ceramic ware. 569, Vaughan, manufacture of lock and latch cases. 791, Schürholz, production of artificial stones. 1,535, Edwards, machines for cutting glass. 1,659, Meather and Bolton, automatic arrangements for safeguarding the wells of lifts. 2,209, Hine, sash fastener. 2,585, Fitton, stone-sawing machinery. 2,855, Forbes, acetylene gas generators. 3,023, Fielding, jib cranes. 3,036, Springborn, precipitation of sewage. 3,537, Hoskin, apparatus for chimneys for prevention of smoke. 4,632, Willetts, hydraulic jacks. 4,857, Baker, granding or pulverising apparatus. 5,607, Green, apparatus for filtering and purifying water. 13,212, Van Kannel Revolving Door Company, Ltd. (*Van Kannel*), revolving doors. 13,673, Cummings, double sash windows. 14,553, Dymond (firm of *Samuel Zielenziger*), incandescent gas lamp. 15,880. Nienstædt, die stocks and wrenches. 16,798, Zappe, underground conduits for electric conductors. 17,908, Diggs, tool sharpeners. 20,105, Munk, device for cooling, purifying and moistening air. 20,245, Hessel and Sippel, beams, joists, &c. 20,770, Heimpel, air-cooling device. 20,947, Gustafsson, apparatus for generating acetylene gas. 21,596, Bollé (*Bruck*), roofs and tiles. 21,791, Blake, hydraulic rams. 22,177, Sutherland, wall and ceiling decorations in hollow relief. 22,302, Bell, floors. 22,303, Bell, manufacture of plates, sheets, or tiles for making partitions, walls, &c. 22,314, Meyer, adjustable support for use on a ladder. 22,497, Wattmann, drainage gulleys. 22,569, Boult (*Fuchs*), building slabs or blocks.

Northern Architectural Association and the Queen.—On January 25th the Council of the Northern Architectural Association agreed to send a resolution to Sir Arthur Bigge, K.C.B., C.M.G., conveying to his Majesty the King and the Royal Family the deep sympathy of the Association in their great sorrow, and at the same time to express their sincere loyalty to the Throne of these realms.

Current Periodicals.

The Antiquary for February presents nothing of special interest. Among the articles is one on "The Passing of Old London," by J. H. Slater.

The Sanitary Inspectors' Journal.—Some notes are given in the January issue on the proposal to establish a branch of the Association in South Africa.

Feilden's Magazine for January is a double number, recording the developments in engineering during the nineteenth century. It is a most interesting number.

The Architects' Magazine for January contains an article on "Earthquake Architecture: How they Build in Manila," and one (from "The Sphere") dealing with the Forum excavations; the illustrations which accompany the latter are not pleasing.

The Church Builder.—The January issue of this quarterly record of the work of the Incorporated Church Building Society contains some observations on the revised "Architectural Requirements and Suggestions" which are sent to all who make application for help towards building or altering churches.

Architectural Association Notes—The February issue contains "New Century Greetings" from the past presidents of the Association. Many of them are very good, and we hope to print some extracts in our next issue (space does not permit this now, the "Notes" having arrived when going to press). The February issue also gives portraits of some A. A. volunteers for South Africa.

The Genealogical Magazine.—In the February issue is an article on the heraldry of "Henry V." at the Lyceum Theatre. The writer cites some curious lapses of heraldry, but states that the play shows a distinct and decided advance in accuracy on any of its predecessors which have come within his notice. "The one bare fact that neither of the two heralds represented in this play either blows or carries a trumpet is portentous, and augurs, if we may so dare hope, that the hardy race of trumpet-blowing heralds will soon, like the white rhinoceros of South Africa, become altogether extinct in 'Stageland,' where they have so often been found."

The Quarry.—As a writer remarks in the January issue, one of the crying defects in our present system of stone selection lies in the difficulty often found by architects in making use of the accumulated experience of the past by a study of the buildings which surround us. "The Quarry" hopes to effect some good by publishing with the March number an illustrated supplement on "The Building Stones of London." In future numbers it is also proposed to devote more attention to slate quarrying. The February issue includes an article on "The Petrography of Building Stone."

The Journal of the Clerks of Works Association.—"Much of our Portland cement stucco-work has failed through insufficient wetting of the underlying brickwork; it was used as a cloak to the rubbish and refuse of the brickfield. Portland cement is essentially a hydraulic cement; it attains in water a hardness of 30deg. greater than in air. The use of hot water or of soda as expedients to accelerate the setting deteriorates the cement; overworking the cement kills it; the first set is always the best. Portland cement is now obtainable as slow setting or quick setting, so that the above-named expedients are uncalled for as a means of reducing labour, or rather loss of time. Terra-cotta that is 'dipped' does not resist the action of the atmosphere on its exposed surfaces. . . . 'Dipping' is the immersion of the dried terra-cotta blocks in liquid clay prior to placing the material in kiln, and has for its object the obtaining of good faces. Manufacturers who are in possession of really good clay would conduce to their own interest by the avoidance of this practice." (Extracts from an article in the January issue of this journal)

The Artist for January reproduces some of Mr. James Baird's modelled friezes. Mr. Baird has done good work in London and Edinburgh: he is a native of the latter city and has studios at Putney. The design for a ceiling shown lacks homogenity: the parts seem to be disjointed instead of forming one complete whole. The number under review also contains reproductions of Mr. A. Hugh Fisher's work and some good book-bindings by Otto Zahn. Botticelli finds a zealous expositor in Miss Edith Harwood.

The British Clayworker.—The "Lancet' recently discovered that mud in streets is more' healthy than dry dust, because "the ultimate fate of mud is the drain-pipe, whereas dust often finds its way to the wind-pipe." This, of course, raises the question of street pavings, and our contemporary, in the issue for January, is of opinion that "there is no better form of sanitary roadway than that paved with suitable bricks. These do not occasion such a noise when traffic goes over them as does granite, and the roadway is easily mended. When properly set, and washed in certain seasons, in the same way as our main thoroughfares are at night time, the brick roadway is infinitely better, more sanitary, and less obnoxious than either wood, granite or asphalt. The bricks must, of course, be non-porous." In the issue mentioned there is also a most interesting review of "A Century of Brickmaking." It is pointed out that brickmaking has always been considered an inferior industry, carried on by uneducated men, and the bricks made by the ancients were no better, and little worse, than those made fifty years ago. Other articles deal with chimney construction, brick drying, marl blasting, and the manufacture of architectural terra-cotta.

The R.I.B.A. Journal.—In the issue for January 12th Mr. Francis Bond reviews Mr. Hope's book on Rochester Cathedral, a building which does indeed swarm with anomalies and aberrations. Says Mr. Bond: "At the very outset, in its pre-Conquest work, it presents us with an insoluble problem. Peterborough has underground one Saxon church; what is Rochester doing with two? . . . One can come to no other conclusion than that, though Roman prelates found the money, English builders furnished the plan. . . It is probable, then, that we have at Rochester, and here only, the plan of an Anglo-Saxon church of the first rank." In the issue for January 26th Mr. Raffles Davison champions the perspective. Here are some of his remarks: "The objection to perspective drawings seem to me to be indicative of a growing feeling against ornamental drawing . . . I would not contend for any adventitious prettiness, but only for truth . . . The truth of the matter is, it is the elevation which is the dangerous and misleading item in the illustration of a design. Things which look well enough in elevation have a trick of turning up very queerly in perspective . . . The most lightly touched-in perspective, if accurate, is better as a realisation than any number of highly-finished elevations . . . I would point to Messrs. Leonard Stokes, Ernest George, Beresford Pite, Aston Webb, T. G. Jackson, H. J. Austin and Reginald Blomfield as men who can, and do, think in perspective, who can draw perspective as well as build perspective . . . For my own part I would urge the architectural student to think incessantly of the perspective result of his creation."

The Building, Engineering and Mining Journal (Sydney, N.S.W.)—The December issues are largely taken up with the competition for the proposed bridge to connect Sydney with the North Shore. As already announced in our columns, the premium of £1,000 was secured by Mr. E. Cruttwell, of London, but none of the designs were recommended for acceptance. Of Mr. Cruttwell's design our contemporary remarks that, "on account of the high price of the accompanying tender, it is practically useless, besides presenting certain novel features of construction which might possibly be attended with failure. . . . The Government intends to forward the plans to some of the most eminent bridge builders in England and the United States, and ask for a full report to be furnished as to the feasibility of carrying out one of the designs. If the report is satisfactory, the Premier proposes either to accept a tender subject to the approval of Parliament, or to get everything in readiness so that the work can be proceeded with as soon as Parliamentary sanction is obtained." Mr. Cruttwell's design shows a cantilever bridge, with a central span of 1,266ft. and side spans of 61ft. each. There are two pairs of main cantilevers, each having a shore arm of 618ft. and a harbour arm of 489ft., while the central span is 288ft. in length. The main trusses are of different strengths, owing to the arrangement of the cross section, whereby the whole of the deck is brought inside the main girders, and the railway tracks are placed adjacent to one of these, instead of being situated at the centre of the bridge. The piers and abutments are of masonry, and full approaches are included in the design.

Scientific American (Building Edition).—There is nothing to note in the January issue: the designs shown preserve their multiplicity of roofs and columns, mixed up unrestrainedly. Special space is devoted to "an Old-English half-timbered house at Greenwich, Conn." "Field stone, laid up in a rustic and rough manner," is used up to the first floor, then tiles (or bricks) to the level of the eaves, and half-timber in the gables.

Stone (New York).—Forty years ago King Ludwig II., of Bavaria, had the desire to build a new castle, and though there was no money in the exchequer and his last castle was still unfinished, designs were prepared by the Court theatre-artist Jank and given into the hands of Von Riedel, the Court architect. To-day Neuschwanstein rises from the summit of a great crag surrounded by snow-capped mountains and the sparkling waters of the Schwan and Alpsee. On such a site a mediocre building would look fine, and this is exactly the case with the King's castle. The style has been termed Romantic-Romanesque! Two illustrations of it are given in the December issue of this publication.

Harper's Magazine.—With Victor Hugo the author everyone is familiar, but with Victor Hugo the artist few are acquainted: yet of his ability to draw we have some surprising examples in the February issue of this magazine. Hugo taught himself, and when voyaging up the Rhine he sketched almost all the old castles and palaces which he saw; and more, when he returned to France, he rediscovered them, changed them, and produced on paper numberless castles of his own imagination, castles which, by the way, were astonishingly unmindful of architectural style. Then he carved and made furniture, and finally attempted etching under the tuition of Maxime Lalanne. He certainly carried into his drawings that strong imaginative power which made his writings so remarkable, but the efforts are of little artistic value in themselves, though most interesting as exemplifying another side to Hugo's character.

The American Architect.—Referring to the paper on "Colour in Architecture" read recently by Mr. A. Wallace Rimington before the Architectural Association, our contemporary remarks in the issue for January 5th that it was, unlike most essays on this subject, full of practical suggestions. "It is hardly necessary to say that the day of alternate voussoirs of black and red brick, and of blue tiles between the consoles of cornices, is over; but the architect has still to deal with many problems of colour, in which a little of the painter's learning can be used to advantage." The plates in this issue are largely devoted to British furniture at the Paris Exhibition. It is satisfactory to hear that our cabinet-makers and decorators, "amidst all the mad rush for novelty, seem to have kept their mental balance better than their Continental competitors. Some indications there were that the inspiration of the 'Elizabethan,' 'Chippendale,' 'Sheraton' and 'Heppelwhite' is still sought, but, on the other hand, many of the exhibits made it perfectly clear that the old styles have met with a powerful rival in that the inception of which is unquestionably due to the arts and crafts. Fortunately, specimens of that abomination the British Louis style—a bastard caricature of the Louis Quinze—were not in evidence. and in its place were productions marked by a refinement—sometimes extreme severity—of line calling for not a little commendation. . . . We have said that this modern style of British cabinet-work owes its origin largely to the arts and crafts, and some of the pieces shown are just such as the strict disciples of Morris—in fact, the Society—revel in. But designers of broader views, while working on similar lines, do not believe that all cabinet-work should be strongly reminiscent of the carpenter's shop, and of these none displayed better work than did the Bath Cabinetmakers Company, Limited. . . . Considered as a whole, the British display in the groups devoted to furnishing and decoration appeared extremely meagre as compared with those of many other countries, but the exhibits, when studied individually, were by no means devoid of interest." The issue for January 12th contains a paper by Mr. C. Howard Walker on "The Grouping of Public Buildings in a Great City," read before the annual convention of the American Institute of Architects. We hope to print this paper shortly. Among the plates are two of the extensions to the Granville Hotel, Ramsgate (Horace Field, architect), and the Convalescent Home at Littlehampton, Sussex (Frederick Wheeler, F.R.I.B.A., architect). These are not worthy specimens of current British architecture. The issue for January 19th contains an article on "The Traceries of the Great Pointed Windows of the Ducal Palace at Venice."

Carpentry and Building (New York).—We learn from the February issue that New York is to have a large new hotel—the Astor—possessing several unique features. It will be sixeen storeys high, thus making it the tallest building of its class in the city. Among the unique features of the building will be "movable pantries" in the shape of two high-speed electric lifts, fitted with electric heated tables, which will convey food from the kitchen to the top floor in a minute and a half; also an artesian well to supply all water, a refrigerating plant, as well as a complete electric lighting and telephone service. All of the large apartments will have servants' rooms, a servants' bathroom and sitting room. The contract for the structural ironwork of the hotel calls for 4,000 tons. Some particulars are also given in this issue of a thirty-storey office building which it is proposed to build. A site having a frontage of 118½ft. on Broadway and about 98ft. on Thirty-third Street has been secured by a company. The building will overtop the one on Park Row, heretofore the tallest by considerably more than 50ft. Measured from the level of the curb to the tip of the iron ornament of the roof the height will be 455ft.

Blanco y Negro (Madrid).—This paper is of little architectural interest, but those interested in wash work will find some excellent specimens in it. Colour work—often most effective—is another feature.

Berliner Architekturwelt.—In the current number are reproduced the winning designs in the competitions for a church at Zehlendorf and a monument to Frederick the Great at Charlottenburg. In the former the first premium was awarded to Hubert Stier, Hanover, the second to Kickton, Potsdam, and the third to F. Lorenzen, Hamburg. In our opinion the second is the best, though none exhibit special ability. The competition for the monument to Frederick the Great has been more successful, and the winning design (by J. Welz and Otto Richter) is most effective. Some examples of modern German furniture are included in this number, as is also a second plate of "Old Berlin" equally as uninteresting and inferior as that published with the previous issue. It may, perhaps, be mentioned that this publication is restricted to Berlin and the work of Berlin architects and artists.

Die Kunst for January contains a number of excellent studies of heads by various artists and several reproductions of the work of Eduard Beyrer, jun., who is in the front rank of the younger sculptors of Munich; his work is most admirable, as is evidenced by the fountain, illustrated in the issue under review, consisting of a female figure holding a vase under each arm, out of which the water pours. Some architectural designs by Schilling and Gräbner, of Dresden, are also reproduced: one or two of them are atrocious, but several have much merit. Novelty at any time is better than dead commonplaceness. The February issue is a most interesting number. Many illustrations are given of furniture by Mr. Charles R. Mackintosh, of Glasgow, Mr. Ashbee, and other similar exhibitors at the eighth exhibition of the Vienna "Secessionists." Some of the designs are strange and wonderful.

Engineering Notes.

Messrs. E. H. Shorland and Brother, of Manchester, have just supplied some more of their patent Manchester stoves to the Union Infirmary, Guildford.

New Post Office, St. Annes-on-Sea.—This building has just been fitted with the latest improved hot-water heating apparatus by John King, Ltd., engineers, of Liverpool.

Tramways in the City.—The Court of Common Council decided last Thursday to oppose the scheme of the London County Council to construct a line of tramway within the City. This was agreed to on the ground that the Bill did not contain provisions for the protection of the public at Ludgate Hill and Snow Hill stations.

An Electricity "Combine."—At Montreal a large trust, called the Lighting and Power Company of Montreal, is being formed to include all the companies now supplying the city with illumination and power. There is much opposition to the combination on the part of consumers, and a powerful lobby will be sent to the Provincial Legislature to try to block the scheme. The directors, however, profess to have no fear of a failure in their enterprise.

Hampstead Underground Railway. — The General Purposes Committee of the Hampstead Borough Council have reported that they are of opinion that a clause should be inserted in the Hampstead Railway Bill prohibiting the company from generating or supplying electricity within the borough; that no station should be situated within the boundaries of Hampstead Heath; and that the elevation of the stations should be first submitted to the Council for their approval.

Easton and Company, Ltd.—This company, whose address is at Broad Sanctuary Chambers, Westminster, S.W., has acquired the business of Easton, Anderson and Goolden, Ltd., together with the works, machinery, patents and patterns. The firm has also—after a full and satisfactory investigation made by Professor Ewing, F.R.S.—secured the sole license for Great Britain and her Colonies for the manufacture and sale of stationary engines of over 10 h.p. superheaters, economisers, and other apparatus under the Schmidt patents, for the utilisation of highly superheated steam.

"The Universal Electrical Directory (J. A. Berly's), 1901."—This book, of which we have received a copy, comprises the names and addresses of 28,586 members of the electrical and kindred industries throughout the world, approximately 2,189 names more than were contained in the book for 1900. For simplicity and facility of reference it is divided into four groups, namely, British, Continental, American and Colonial, which are again sub-divided into alphabetical and classified sections; in the case of the British a Geographical Section is given, making in all nine sub-divisions. Altogether there are about 1,250 pages entirely of directory matter. The price is 7s. 6d.; abroad, 8s. 6d.

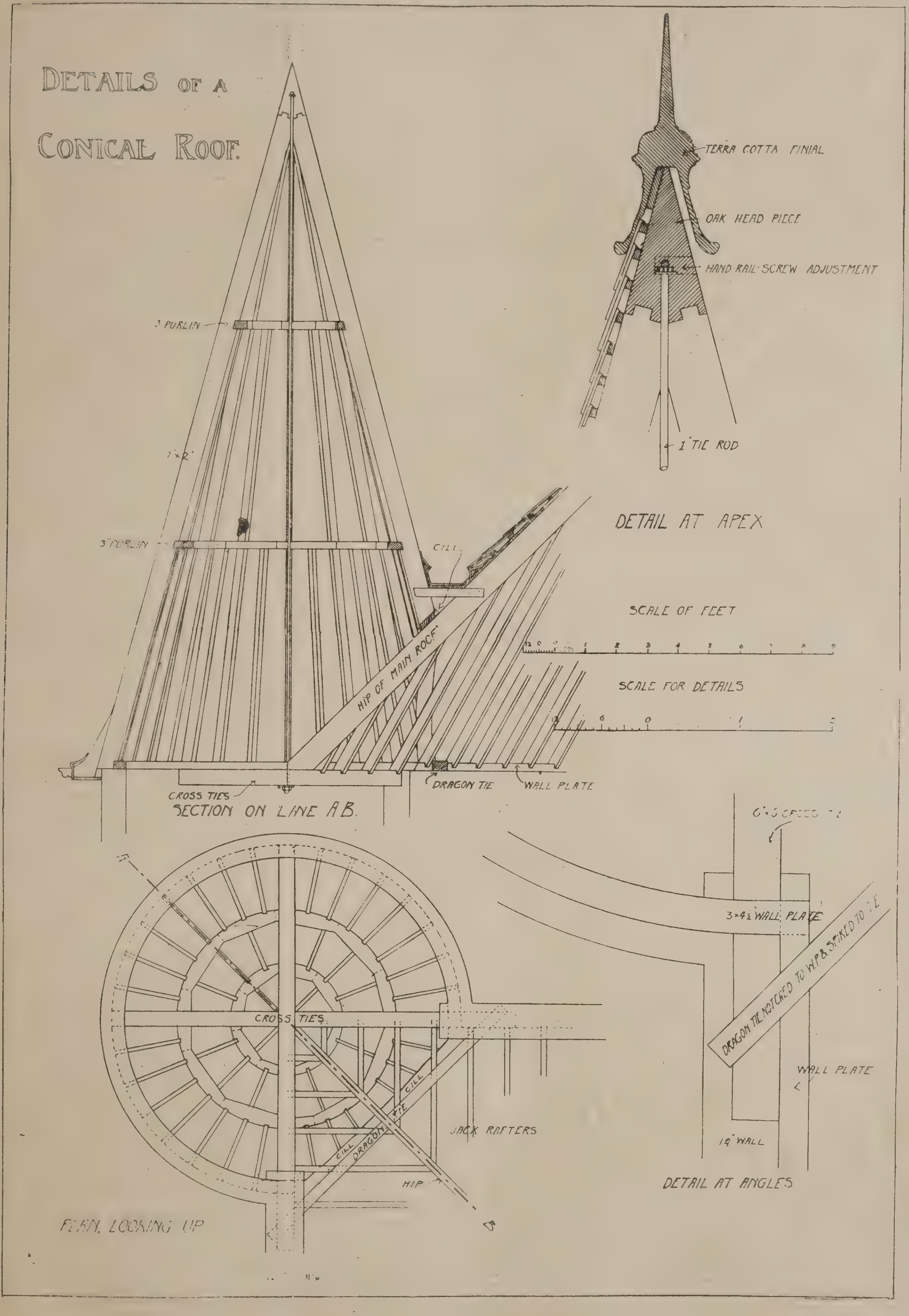
Tramway Expansion.—At the recent general meeting of the members of the Tramways and Light Railways Association, the Chairman said that the Association was formed about eighteen months ago to develop means of transit throughout this country, chiefly by means of electricity. The development of tramways here had not been commensurate with that which had taken place in other countries. Thus, in the United States in 1890 there were not more than 150 miles of tramways; now there were 20,000 car miles. In this country only about 175 miles had been added since the date mentioned; and altogether there were not more than 1,200 miles. One advantage would be the reduction in cost from 5d. to 8d. per car mile, in place of 9d. to 1s. by horse power. The great hindrance to tramway expansion here was the restriction put by law and regulation upon it. There were two Acts of Parliament which did this, the Tramways Act and the Light Railways Act; these the Association hoped to amend.

A Remarkable Bridge Collapse.—On Thursday last Buckie Burn Bridge, Banffshire, which two days before had been formally christened the "Queen Victoria Bridge," collapsed suddenly and completely. Fortunately no one was killed. Steadily for a week a fierce storm had played upon the structure, which was just on the point of leaving the hands of the contractors, Messrs. Stuart and Sons, of Peterhead; on Wednesday night the gale was felt in full force up the valley of the Burn. The two central piers, built of masonry, hearted with concrete, 6ft. 6in. wide at the base, tapering to 4ft. 6in., collapsed under the strain, there being, it is computed, fully a thousand tons of superstructure resting on them. The three arches, two of 25ft. and one of 34ft., went bodily into the valley 40ft. below, snapping off like a pipe stem at the granite pilasters, and leaving a yawning gulf 100ft. wide. The debris, consisting of bricks, scaffolding, granite blocks, concrete, stones and sand, completely choked up the valley and dammed back the burn, which is in flood, forming a lake 20ft. deep and extending far up the valley. The constructors began the bridge on August 4th last. A month ago the Town Council decided to add 3ft. of extra height to the superstructure, and this, after having been approved by the consulting engineer, had just been done when the disaster happened. The roadway was 45ft. wide. Each of the smaller arches was circled with three rings of brick, a coating of 6in. of cement being laid over all, the central span having four rings. Peterhead granite was largely used in the erection.

DETAILS OF A CONICAL ROOF.

By R. W. CARDEN, A.R.I.B.A.

THIS turret is taken as occurring at the angle of a large hip-roofed building in such a way that the foot of the hip has to be carried independently of the walls. Two 6in. by 6in. cross-ties are placed diagonally across the turret and the hip is carried by these, the cross-ties resting upon stone templates. The wall-plate (dotted on plan) is carried round above the cross-ties, properly halved at the two angles, and the outward thrust is counteracted by the dragon-tie, which is notched to both wall-plates and spiked securely to the cross-ties in order to keep them in position as well. An angle piece to the hip has not been shown, but it could easily, and perhaps with advantage, be added. The main difficulty is reached when dealing with the rafters, as the framing at the apex is complex, and when done, if there are many rafters, most unstable. In this example they are carefully reduced in number until only eight run up the whole height, half the total number being stopped at the first purlin and half those remaining being stopped at the second one. The head-piece is of oak, mortised to receive the heads of the rafters, drilled for the head of tie-rod, and mortised again for the insertion of the nut. This tie-rod (of 1in. diameter) is carried down through the intersection of the cross-ties and can be easily tightened up from the underside so as to keep the whole of the roof rigid. It will be noticed that the shorter jack rafters of the main roof where they do not butt down to the wall-plate are notched on to the cross-ties. At the intersection of the two roofs a 2in. sill-piece has been fixed to the jack rafters of the main roof and the rafters of the turret brought down upon and notched into it. The covering may be of tile, slate or metal, but in the last case boarding would of course be indispensable.


DETAILS OF A CONICAL ROOF

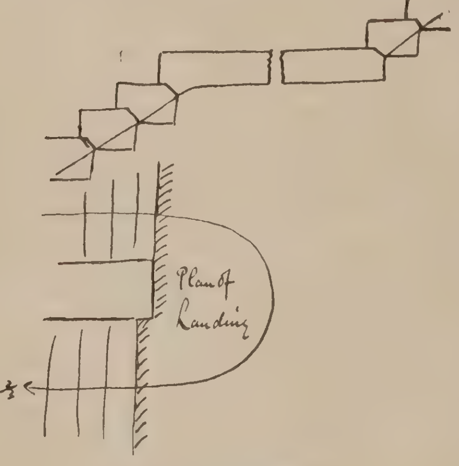
Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Stone Staircases.

GALLATOWN.—KIRKCALDY writes: "What rule is there for determining the thickness of stone or brick staircase walls having stone feather-edged steps pinned into the wall at one end only and hanging 5ft. into staircase with a well-hole between the open ends 2ft. wide? The stair in the instance referred to is composed of a series of straight flights with level landings of stone or concrete. The total height from ground to top floor is 52ft., each storey being 13ft. high. Should any special precautions be taken in regard to the fixing of the stone or concrete landings or the joint of top step of each flight with same?"

The brick walls in question should be for the three lower storeys 18in., and the top storey 14in. The steps should go into wall 9in. and should have a solid end to ensure a horizontal bed (see accompanying sketch, which also shows the joint of landing with top step and the step starting from landing). The precautions to be taken in fixing steps and landings if the same are not built in as the walls are raised are—(*a*) sand courses should be left for steps; (*b*) wherever landings go into a wall a course of stout Yorkshire paving or of thin landings should be laid; over that, three courses of bricks with sand, 9in. only; and over that another course of landings to go through the whole thickness of the wall. When the staircase is ready for fixing, the bricks are taken out with little trouble, and without injuring the wall in the least. The landings in all public buildings should be arranged in this manner. Great care should be taken when pinning the wall to see that it is made quite solid with grout.



STONE STAIRCASES.

I. W.

Classes in Building Construction.

LONDON, W.—F. H. writes: "I should be glad to know of any technical school where evening classes in building construction are held during the summer months."

All classes in this subject begin about the last week in September and end some time in May, generally with the South Kensington Examination. At the City of London College the classes meet on the afternoon of the examination for a final coaching and the week after the examination to enable the teacher to confer with the students as to their difficulties and to show them how the questions should have been answered. It would hardly be possible to get enough students together in all London to form a class during the summer months for this subject; it is quite enough for them to work hard all through the winter.

HENRY ADAMS.

Moment of Inertia.

ILKLEY.—R. F. writes: "Can you explain exactly in everyday words the meaning of 'moment of inertia'? Is it equal to the area of the section multiplied by the radius of gyration or the square of the radius of gyration? 'The Builder' (December 1st, 1900, p. 488) and 'Rivington' (Vol. IV., p. 332) seem to differ on this point. What is meant by radius of gyration, and how is it found for any general section? Does Gordon's formula for struts depend on it?"

In order to attempt the solution of the problem set we must first define what is meant by "inertia." Newton's first law of motion is as follows:—Every body continues in its state of rest or of uniform motion in a straight line except in so far as it is compelled by force to change that state. Now every body, according to the law, preserves its "state" of rest or of motion in a straight line when not acted upon by other forces, and it is this property (this "state") which is designated the inertia of matter, in virtue of which it is incapable of varying in any way its state of rest or motion. It may be the spot of forces for any length of time, but so soon as they cease to act it remains in the state in which it was left until they recommence their action upon it. The centre of inertia or mass of a body is a point whose distance from any plane is equal to the sum of the products of each mass into its distance from the same plane divided by the sum of the masses. This point coincides with the centre of gravity, but it must be borne in mind that the centre of gravity differs radically from the centre of inertia; for while every agglomeration of particles into a body has a centre of inertia, we can only approximately say of it that it has a centre of gravity. We do not see that such a definition as that of "moment of inertia" can possibly be put into everyday words, for it deals with subjects which are out of the pale of ordinary commonplace. In a rotating body it is the sum of the products formed by multiplying the mass of each particle (forming a part of that rotating body) by the square of the distance (of that particle) from an axis, or "the moment of inertia of a body about any axis is the sum of the products of the mass of each particle of the body into the square of the particle's (least) distance from the axis."

Another, and possibly more generally comprehensible, definition is that it is the sum of the products made by multiplying the number of units in each mass by the number of units in the square of its distance from the axis. If "Rivington" (Vol. iv., p. 111) be referred to, it will be seen that

$$(\text{radius of gyration})^2 = \frac{\text{moment of inertia of the cross section}}{\text{area of cross section}}$$

This is correct, and gives as easily understood a definition of "radius of gyration" as it is easy to find. "Rivington" continues: "The value of the M.I. of the cross-section varies according to the axis about which it is taken, but when taken about an axis through the C.G. of the cross-section, perpendicular to the direction in which the column tends to bend, it is a minimum, and the radius of gyration found from this M.I. is the one to insert in the formula." The formula referred to is given on the previous page, and is that of Rouleaux; but consideration of what follows will show how and in what way Gordon's formula also depends on the radius of gyration.

G. A. T. M.

Workmen's Compensation Act, 1897: Insuring of Architects' Assistants.

DUNDEE.—FORFAR writes: "It has been represented to us that under this Act we, as architects, should insure our assistants and apprentices against accident or damage incurred on any building which we are erecting or otherwise in our employment. It seems to us that our men must be classed as professional men not as workmen, and that we are not contractors in any sense of the word."

You would not be liable under the Act, as you do not undertake the construction, repair or demolition of buildings; therefore you need not insure.

A. O. H.

Lightning Conductors.

LOUGHTON, ESSEX.—S. H. J. M. writes: "Why do some experts recommend non-insulation of lightning conductors; is not the electricity in such cases liable to go from the tape into the copper clips and so enter the wall?"

"S. H. J. M." is scarcely correct in the wording of his question. I do not think *any* expert recommends the use of insulators. Insulation for a small current such as would be used for an electric-bell circuit may be very thin; for the more powerful current in electric-light leads it must be thicker, and so on till we get to a conductor carrying a discharge of lightning, for which insulation would require to be about 5ft. thick (or, say, 10ft. diameter) to be effective, because sparking from an improperly applied lightning conductor might take place to nearly that length. Therefore insulation by means of glass insulators is impracticable. They do harm, because the conductor is intended to reduce the likelihood of the building being struck by the lowering of potential through brush discharge at the points, and insulating the conductor, though it would still permit reduction of the potential of the earth, would leave the building charged, and therefore liable to be struck.

When a conductor is struck the potential is momentarily raised to an enormous extent, and this extends to the fastenings or other metals in contact with it, and sparks will pass to adjacent metals to which it is not connected, especially to gas and water pipes; but if this occurred it would show want of knowledge in the planning of the conductor. Sparking does not occur merely into brickwork: it is a local effect between two planes at different potentials—in one case between cloud and earth, in the other between the conductor and any metal dangerously near to it, say an iron safe on the inside of a 14in. wall, and just behind the conductor. The question of what metals will lead to sparking and what will not is one of the most difficult branches of the subject, and cannot be explained here. Sparking from a properly and scientifically applied conductor fixed in contact with the building will not occur.

ALFRED HANDS.

Book on Heating and Ventilation.

NEWCASTLE-ON-TYNE.—A. J. R. writes: "Kindly inform me of a good and inexpensive book on heating and ventilation."

"Hood on Warming and Ventilating," rewritten by Frederick Dye, price 15s. E. & F. N. Spon, 125 Strand, W.C., are the publishers. "Ventilation and Warming of Houses, Churches, Schools and other Buildings," by Prof. E. H. Jacob, price 1s. 2d. post free, is useful. It can be obtained from Mr. B. T. Batsford, 94 High Holborn, W.C.

Books on Architectural History.

WOLVERHAMPTON.—W. V. V. writes: "Which are the best books for the study of architecture, dealing with both the Classic and Gothic periods? Is there such a book as a history dealing with architecture from the earliest time down to the present, fully illustrated, with proportional diagrams of mouldings, caps, vaulting, &c.? Is Professor Banister Fletcher's 'History of Architecture' a concise and explicit work on the subject?"

"Fergusson's History of Architecture": Ancient and Mediæval, two vols., £2 9s.; Indian and Eastern, £1 5s.; The Modern Styles, two vols., £1 5s., is the most complete history we can recommend. Complete sets (5 vols.) can be obtained from Mr. B. T. Batsford for £3 18s. Professor Banister Fletcher's "History" is a very concise and useful work; it can be recommended.

Sound-proof Walls.

NORTH SHIELDS.—P. J. S. writes: "What would be the best and cleanest method of deafening a floor without removing the floor boards if possible? What would be the best material to use, and the easiest way of fixing it?"

An illustrated article is in hand on the protection of houses from damp, cold, heat and noise. This will doubtless supply our correspondent with the information he desires.

Contract Signed by Builder's Foreman.

HALIFAX.—TOMAS A DOUBTFUL writes: "Two tenders by a contractor for mason's and carpenter's work were accepted, but instead of calling to sign them himself his foreman did so, signing the contractor's name (per pro) with his own below. Is the foreman's signature binding on the contractor? Some dispute has arisen. Can the contractor refuse to go on with the work, or is the fact of having allowed the work to proceed in his name sufficient to bind him to complete the whole?"

If the foreman was authorised either expressly or impliedly to make the contract, the contractor is bound, no matter what position the foreman occupied, and if the contractor were not bound in the first instance his allowing the work to go forward would render him liable.

A. O. H.

Removing Rainwater Pipes.

SCARBOROUGH.—ENQUIRER writes: "My clients have bought four houses which face a private passage belonging to them. They intend to pull them down and to build a workshop over the whole site. There is a rainwater pipe at the end of their passage which goes into the ground (no gully being there) and taking the rainwater of adjoining property. The drain to the four houses may go to the end of the passage, and this pipe may go direct into it, but this is not thought so. It is all very old property. Can we take down this rainwater pipe, or what course should we adopt?"

As it would appear that the rainwater pipe has been in its present position for considerably more than nineteen years, your clients have now no legal right to remove it or to compel its removal. Your best course would be to approach the owner of the adjoining property and endeavour to arrive at some arrangement which would be satisfactory to both parties. If the owner is a reasonable man, he will probably have no objection to some suitable readjustment being made, provided that your clients bear all the expenses in connection therewith.

T. E. C.

Book on Trigonometry.

BARKING, ESSEX.—J. C. B. writes: "Kindly name a book on elementary trigonometry. Please give me plan of village school, accommodation for 200, showing boys' schoolroom and girls' and infants' room combined. Site is quite open and situated at corner formed by two roads meeting at right angles.

Lock's "Elementary Trigonometry" (Macmillan and Company), 4s. 6d. We desire to inform our correspondent that it is not our business to supply plans in the manner he suggests. He had better consult an architect.

"Scotia" or "Scocia."

SOUTHPORT.—SOUTHPORT writes: "Which is proper, *scotia* or *scocia*?"

The correct spelling is "scotia." The word comes from the Greek *skotia*, which means, literally, darkness: the surface of the moulding is in shadow.

Window Tracery.

NEWPORT, MON.—PROBATIONER writes: "Is there any rule for finding the centres of the various curves in the tracery of a Decorated window (assuming that of the arch is known)? What amount of architectural knowledge is required for Honours Building Construction (the syllabus is very indefinite)? Which are the cheapest books on architecture sufficient for the intermediate R.I.B A. examination?"

All window tracery is based upon a geometrical outline of the various parts, but no general rule can be laid down, as each window is more or less an original design, and the centres are taken accordingly. Some of the larger works on architecture show portions of the windows in geometrical outline with the centres, and the remainder finished completely. Some elementary examples are given in Davidson's "Gothic Stonework" (Cassell and Co.).

In Honours Building Construction a general historical knowledge of the leading buildings and architectural styles of the world is required, with ability to sketch from memory the more important Classic and Gothic details. For books on architecture, see the syllabus of the R I.B.A. examination.

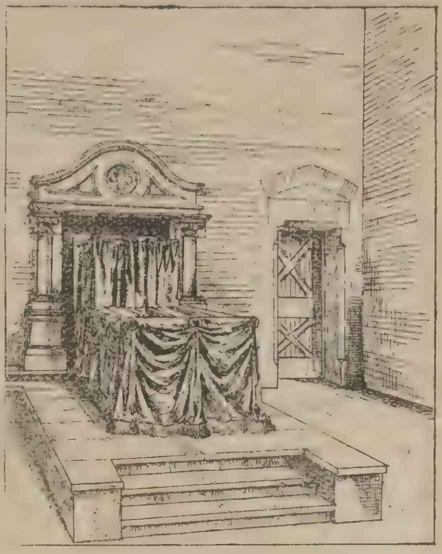
HENRY ADAMS.

HULL CREMATORIUM.

THE first definite step towards the erection of a crematorium in Hull was taken on October 3rd, 1892, when, at a meeting of the Burial Committee of the Corporation, it was decided that the Borough Engineer (Mr. A. E. White) should prepare plans of such a building so that the Corporation might be in a position to proceed with it on receiving the authority of the Local Government Board.

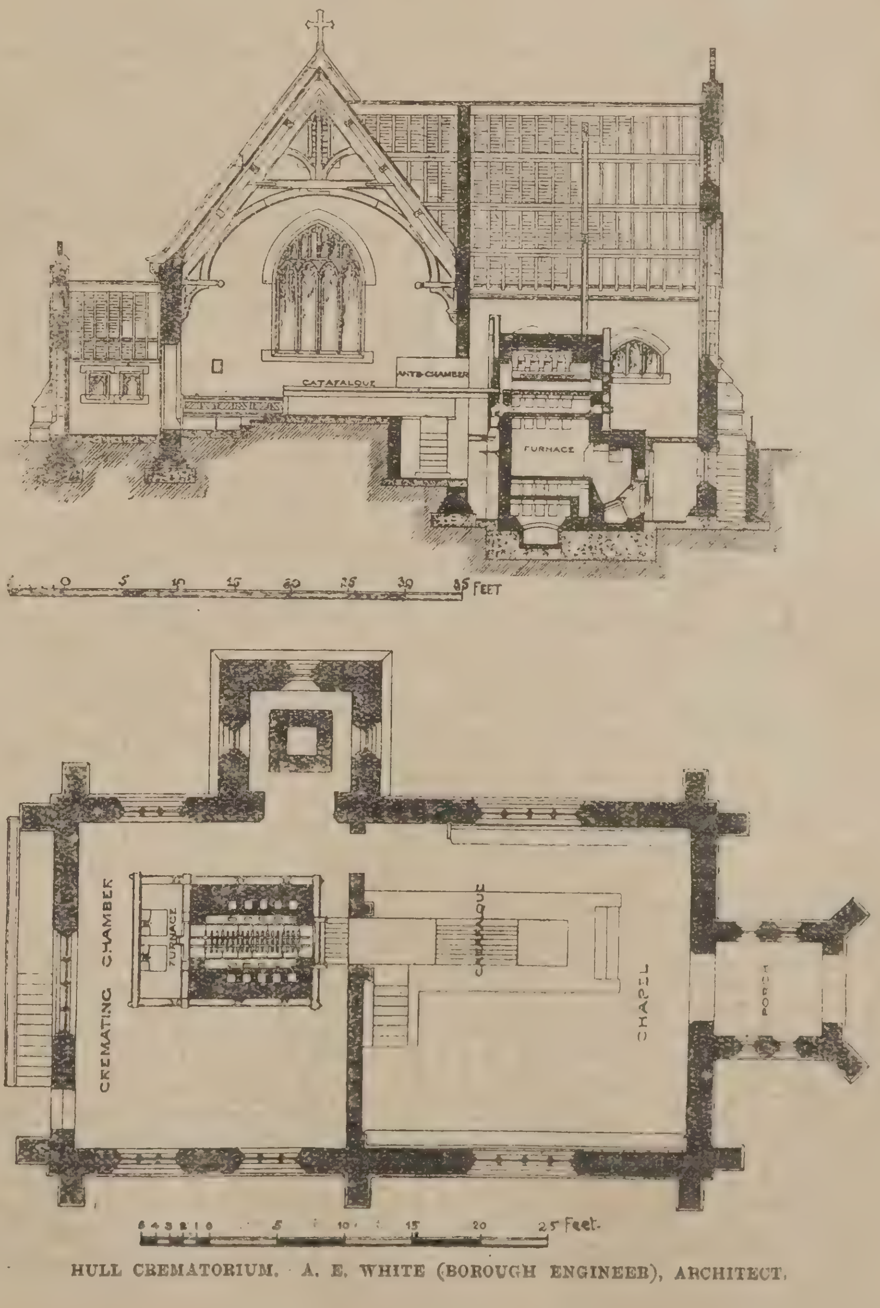
The Council at this time contemplated the erection of a chapel in the Western Cemetery. The Borough Engineer suggested the modification of the plans so as to include a crematorium. The suggestion was adopted, and when the chapel was erected in 1896-7 foundations were put in for a furnace chamber and chimney tower, so that these might readily be added at any future time.

Meanwhile, as it appeared doubtful whether municipal authorities could legally expend money on crematoria, it was decided to apply for Parliamentary powers, which in due course were obtained. Plans were then prepared by the Borough Engineer, and the building was opened on January 2nd last. It is the first municipal crematorium erected in this country.



THE CATAFALQUE.

The building is situated on a piece of land



HULL CREMATORIUM. A. E. WHITE (BOROUGH ENGINEER), ARCHITECT.

to the north-east of the Hedon Road Cemetery, and is of red brick externally, with artificial stone dressings; the style is early Perpendicular, freely treated. It comprises a hall or chapel 24ft. square, a second room containing the incinerating chamber, and a tower 70ft. high. The cremating apparatus is a furnace of the regenerative type, designed by the late Mr. Henry Simon, president of the Manchester Cremation Society. Described in the briefest possible manner, it consists of three interior chambers, the two lower of which are surrounded by air-passages. The lower chamber contains a coke fire, and the upper one is that in which cremation takes place. The fire is lighted some hours before the apparatus is to be used, and is supplied with air in the usual way. By the time the apparatus is ready for use the walls of the air-passages are thoroughly heated. Most of the direct air-supply is then cut off, and the partially-consumed gas (carbonic oxide) from the coke is allowed to mix in the second chamber with the air heated by passing through the side air-passages. The incinerating chamber is thus filled with gas of an intensely oxidising character in a state of incandescence. The degree of heat can be regulated in the most exact manner. There is no smoke and little visible flame before the body is introduced, and if the coffin is made in accordance with directions, there is equally no smoke and no noise during cremation. The process occupies about one hour, at the end of which there remain only the inorganic bases of the bones. These are in the form of silvery grey pumice-like fragments, which are removed by passing an asbestos brush through the chamber, which causes the remains to fall through an opening into the urn which is to receive them; they are not otherwise handled in any way.

It should be explained that the interior of the cremating chamber is at no time visible to mourners. The coffin, when brought into the chapel, is placed upon a catafalque. When the committal sentence in the religious service is reached, it passes noiselessly by means of an invisible mechanical arrangement through curtains into an intermediate chamber, and the curtains fall behind the coffin before it enters the cremating chamber.

Professional Practice.

Aberdeen.—The extension of the Fish Market has recently been completed, with the exception of the offices, which will not be ready for occupation just yet. The new building, which extends practically the whole length of the quay, along South Market Street, has a length of about 430ft., and has a width of 50ft., which is about 14ft. wider than the old portion. The outside of the wall to South Market Street has red Ruabon bricks, while the inside is laid with brown glazed Ruabon bricks. The erection is on the same lines as the old part, being open at the front. The roof, which is constructed of wood and slated—not of corrugated iron like the old building—is supported by steel girders laid on a double row of pillars, and from its construction it can be adapted for storage purposes if necessary. The building will be electrically lighted, twelve arc lamps having been fitted up—six being erected at the front of the market and the other six at the back. The building has also those accessories necessary at a fish market, such a water-taps, benches, &c. The floor is entirely laid with concrete. The offices will be a two-storey erection situated at the junction of the old and new portions of the market, and is 91ft. by 50ft. The base of the outside walls is constructed of brown glazed Ruabon bricks, while the upper portion is of red bricks, variety being lent by belts of pink bricks. The windows on the ground floor are arched, with pink facing and key blocks. The apex at one end of the roof bears the representation of a fish, while the other bears that of a ship. Telegraph and superintendent's offices will be on the ground floor, while the upper floor will be utilised as berthing master's office, collector's office, restaurant, &c. There will also be several spare rooms. The contractors were:—Mason, Charles Gordon; carpenter, George Jamieson; slater, Forbes Morrison; plumbers, J. Blaikie and Son; painter, John Williamson; plasterers, Sellar and Company. The architect was Mr. R. G. Wilson. The total cost of the new addition to the market is about £5,000.

Arbroath.—New shambles have recently been erected on the piece of ground formerly occupied by the Arbroath Sawmill Company, entrance being obtained from North Grimsby. The two-storey buildings adjoining are to be used as offices and dwelling-houses for the sub-inspector and caretaker, while on the right-hand side is a lofty and well-ventilated dead-meat house, in which accommodation can be had for about 200 carcasses. Separated by a causewayed road are the slaughtering booths, of which there are five—three single and one double. At the rear of the killing booths the byres, capable of accommodating sixty cattle, and a large sheep pen, with separate killing-house, are situated. The byres are well ventilated, and are fitted with automatic-watering troughs. A third range of buildings contains a hide and tallow shed, two loose boxes for cattle, a piggery, a boiler and engine-house, and a spare booth of considerable dimensions, A section of the upper part of this range is to be utilised as a hay and straw loft. For animals newly brought in and showing signs of restlessness a large open court, with concrete floor and enclosed with strong iron railings, is provided near the gateway. The buildings were designed by Mr. Hugh Gavin, architect, Arbroath, and the contractors were:—Mason and brick work, Messrs. Ramsay and Gordon; joiner work, Mr. James Robertson; slater work, Messrs. Mitchell and Son; plumber, Mr. Dyer; plasterer, Mr. A. Patterson; painter, Mr. Anderson; smith work, Messrs. Peter Herron and Son; engineer, Mr. Bruce, Dundee.

Huddersfield.—The Theatre Royal and Opera House has recently been extensively altered and repaired at a cost of £5,000. The plans and specifications for the whole of the improvements, alterations and decorations were prepared by Mr. Sydney Ingham, architect, of Southport. The principal entrance has been entirely reconstructed, with the result that new exits from the pit and upper circle have been made into Ramsden Street, whilst there is a new exit from the orchestra stalls into Bull and Mouth Street, and an additional emergency door made from the stage into Little Queen Street. The dressing-rooms, which are in the basement under the pit floor, have been rearranged, enlarged, and increased in number. The walls have been newly plastered and finished with Keen's cement, and the dressing-rooms supplied with hot and cold water. The dress circle entrance is by a new fireproof floor, on steel joists and concrete, finished with Terazzo marble flooring. The new box office fittings are of mahogany. The old wooden staircase to the dress circle has been superseded by a fireproof one consisting of moulded stone with brass handrail and mahogany dado. The front portion of the entrance hall is of moulded and panelled mahogany, with plate glass in the upper panels and the remainder of slightly-tinted glass. The dress circle has been increased in area by the removal of old storerooms in the two wings of what will now be the new promenade. New cloak-room accommodation has been obtained near the entrance to the dress circle by reducing what was formerly the refreshment bar, which is now considerably smaller than it was before. The dress circle is supplied with new chairs by Messrs. A. R. Dean and Co., upholstered in blue plush with gilded iron ornamentation. Chairs similar in design are in the upper circle and orchestra stalls. The boxes on each side of the dress and upper circles have been reconstructed with a view to securing a better sight-line to the stage. The walls of the dress circle have been covered with a blue paper; the ceiling and pillars have been decorated with Duresco ceiling. In the upper circle the floors have been reconstructed, and the cloak-room and lavatory arrangements increased on the same lines as those in the dress circle. The gallery has also had new seats provided, and new windows knocked into the walls facing into Ramsden Street. The ceiling of the whole building, which has been lowered, is now constructed of fibrous plaster of an elaborate design, and contains panels in which are inscribed the names of noted dramatists and composers. Under the new arrangements the stage will be entirely shut off from the auditorium by a fire-proof curtain, for which cast-iron grooves have been fixed on each side. The other openings in this wall are all of iron. In addition, an arrangement of automatic sprinklers, which come into operation in case of fire, has been fixed. There has also been a new installation of the electric light. The lighting arrangements throughout the house are controlled by a switchboard at the corner of the stage. A new system of heating and ventilating has also been carried out throughout the house.

Leicester.—The old Trinity Hospital, built over five and a half centuries ago, has now been partly demolished; some portion of the building will, however, form part of the new hospital which is to be erected. Some of the graceful arches, which in the earlier days of the hospital flanked the centre aisle and gave support to the heavy and substantial roof, are to be allowed to remain, while the quaint chapel at the eastern end of the hospital will stand untouched. In appearance the building will be entirely altered. It will be more than double the dimensions of the old hospital. The architect is Mr. J. Goodacre. As stated, eight of the old arches will remain at the front and back of the building, and those facing the street will be filled in as they were before, but with red brick, and will form the front elevation. The windows will be very much larger, adding to the light of the interior. The principal entrance will be in this portion of the building. The old portion of the building will not contain any living-rooms for the old people who are now housed, but will form a meeting-place for all who prefer not to remain in their own rooms. To the right of the entrance will be the men's day-room, an airy and comfortable apartment 36ft. by 20ft., and as high as the building itself. It will be properly furnished and the walls will be panelled. The entrance-hall itself—about 24ft. by 20ft.—merges into the ambulatory, about 10ft. wide and extending the length of the old portion of the hospital, and terminating in the chapel. The remaining space is divided into rooms for the doctor and the porter. The street frontage of this part of the building, exclusive of the chapel, will be 104ft. The new wing of the hospital follows the bend of the street, and stretches in the direction of the canal, with a street frontage of 168ft. Like the old portion it will be of red brick, with Derbyshire stone facings. This part of the hospital will be set back about 25ft. from the street, giving a strip of turf in front. On the ground-floor there will be twenty rooms, each 12ft. by 14ft., with a corridor 7ft. wide running the whole length of the wing, and two short corridors the depth of the building to give light and air, the absence of which was a fault in the old hospital. On the first floor there will be 17 women's rooms, each 14ft. by 12ft., with a matron's room, and a commodious dayroom with a bay window gives an extensive view of the street. Each little room contains its own oven and boiler for the convenience of the old ladies who like to do their own cooking, The kitchen and the other usual offices stand away from the building, and are reached by corridors. There are to be fireproof floors and stone staircases. The west-end of the corridor leads to the gardens, which, owing to the slope of the land, will be terraced. On the ground between the hospital and the canal it is proposed at some future date to erect a small infirmary. Each inmate will have a little coal cellar or bunker at the back of the hospital, and the consumption of coal in the room of each will depend on the individual liking for a large or small fire. The place throughout will be heated with hot water coils, so that the fires embody a concession to custom and appearances. There is attached to the hospital a large kitchen where the food of the inmates is prepared; but any old lady may cook her food in her own room in the manner she prefers. It is in such slight matters as these that the difference occurs between such a place as the Trinity Hospital and an ordinary asylum for the poor.

Perth.—A new consumptive hospital at Perth is being erected at Barnhill. It is situated on a site about 600ft. above the level of the sea. There are eight wards in the building, which has been designed to accommodate from 16 to 20 patients. The hospital is faced with pressed bricks, and the centre or administrative ward is two storeys in height, the nurses' bedrooms being situated above the administrative department. The wards are one storey in height, and extend to either side, the female ward being to the west, while the male ward is at the east of the hospital. At the back of the east wing there are bathrooms, lavatory accommodation, &c., and in front there is a verandah, where the patients can have the benefit of the open air if the weather precludes them going into the open. At the back of the administrative block are dining-rooms for the patients and also for the nurses and attendants. There is a two-storey block for the kitchen apartments, larders, &c., and servants' bedrooms above. The building has been designed by Mr. J. Murray Robertson, architect. F.R.I.B.A., Dundee. The following are the contractors who are carrying out the work:—Mason work, Mr. T. S. Dick, Broughty Ferry; bricklayer, Mr. Luke Linder, St. Andrews; joiner, Mr. W. M'Quibban, Perth; plasterer and tile layer, Mr. Alexander M'Ritchie, Dundee; slater, Mr. John Walker, Alyth; plumbers, Messrs. Frew, Watson and Co, Perth; steam heating and cooking, Mr. Henry Walker and Son, Newcastle-on-Tyne. The clerk of works is Mr. William S. Cownie.

Rochester.—Suffolk House, formerly the residence of Sir Richard Head, who was elected Mayor of Rochester in 1683, has been acquired by the Capital and Counties Bank, Limited, and last week the premises were opened as a branch of that bank. The house will be the private residence of the manager, the business of the bank being carried on in that portion of the old mansion that was recently used as a shop. The old shop front has been replaced by a front of Portland stone. One of the features of the old house is the wainscotting of several of the apartments. In the bank chamber the walls will still be lined with the old deal panelling which has been untouched (but for a coat of paint) in the other portions of the house. The doors, counter and fittings of the bank are all of oak. A brass grill protects the counter. The floor of the entrance and of the space apportioned to the public is paved with mosaic, wooden blocks being used behind the counter. The heating is by hot water. The manager's room is separated from the bank by a glazed oak screen, the bay window of which, looking out over the Common, is glazed with leaded glazings bearing the arms of the bank, the arms of the City of Rochester, the arms of Sir Richard Head and also his crest. The window also displays the arms of King James II., who was the guest of Sir Richard in December 1688. The strong room of the bank is situated in the basement, the safe and strong room door being supplied by the Ratner Safe Company. As was the case with the Chatham branch, the alterations are being carried out by Messrs. West Brothers, builders, of Rochester and Strood; while the furnishings are also supplied by a local tradesman, Mr. C. A. Cobb. The architect, Mr. E. F. Cobb, A.R.I.B.A., has sought to preserve as much of the old building as was consistent with making the premises suitable for business purposes.

South Shields.—At the corner of Chapter Row and Market Square, new buildings are being erected for the Water Company. The proposed building will have a frontage of 43ft. to the Market Place, and 92ft. to Chapter Row, and will cover double the area occupied by the present offices of the Company and workshops. It is planned in two departments, communicating, one for office and public use, and the other for workshops. The building which is designed in a free Renaissance treatment has elevations to both Chapter Row and the Market Place, the latter being built on the ground floor with polished red and grey granite. The upper storeys are finished in red brickwork, relieved with moulded and carved stone work, and the whole surmounted by an ornamental stone turret. The basement comprises cellars for pipe storage and heating apparatus. On the ground floor there will be a large general office approached through a tiled hall, where separate waiting accommodation will be provided for the use of the public. Communicating with the general office are a manager's room, strong room, telephone room, &c. The remainder of the ground floor is devoted to workshops, &c. The first floor is approached by a stone staircase, and contains a Board room, out-door inspector's and other offices, and additional workshops. On the top floor a suite of dwelling rooms have been provided, together with further offices and store room. Special attention has been given to the sanitary arrangements, and the building will be largely of fireproof construction. The work which is expected to cost between £7,000 and £8,000, is being carried out by Mr. R. Allison of Whitburn, from the designs and under the supervision of Mr. Henry Grieves, A.R.I.B.A., architect, of South Shields.

St. Helen's, Hastings.—New schools at St. Helen's, opposite the Hastings Borough Cemetery were recently opened. The building comprises two floors, with covered playgrounds and a heating chamber under a part of the ground floor. The site is about an acre in extent. At present the ground floor is used as an infants' school, to accommodate 190 infants. On the first floor is the mixed school to hold 260 children. There are teachers' rooms in both the infants' and mixed schools. These rooms are in each case on a level with a dais, and by throwing back the folding doors this can be converted into a platform, to be used in connection with the central halls, when they are required for public meetings. The building is constructed of red brick, with moulded red brick facings on the front and sides, the back being perfectly plain, and the roof is covered with red tiles. The buildings were erected by Mr. T. T. Denny of Walmer, Kent, and Mr. Arthur Wells, F.R.I.B.A., was the architect. The heating arrangement and boiler were supplied by Messrs. Upfield and Sons, of High Street, Hastings. The amount of the contract for the erection of the buildings was £9,755, the total cost being £11,888.

Surveying and Sanitary Notes.

Streets Up in London.—The City of London Corporation have passed a resolution that works which entail interference with the main streets of the City shall be in future carried on continuously day and night until completed. The Engineer has been instructed accordingly in regard to future paving works in the City.

The Scientific Roll is the title of a new magazine of systematised notes of scientific bibliography on bacteria (schizomycetes) conducted by Mr. Alexander Ramsay. The first issue affords a ready means by which persons interested in bacteria may learn what has been published on any bacteriological topic. Frequently passages of considerable length will be taken verbatim, although generally summarised, and the general drift of the ideas given. In all cases the notes represent the authors' statements in their own language. Mr. R. L. Shailand, 38 Churchfield Road, Acton, London, W., is the publisher; the price is one shilling.

A Valuable South London Site.—The sale of the site and buildings of the Indigent Blind Schools, situated in St. George's Circus, S.E., has been completed. The consideration money, arranged by Mr. Reginald Roumieu, who acted as surveyor to the schools, was £140,000. The purchasers were the Baker Street and Waterloo Railway Company, who were represented by their surveyor, Mr. Leslie R. Vigers, of Frederick's Place, Old Jewry. During the construction of the new buildings for the schools on a site near the old church at Leatherhead, Surrey, only a portion of the existing buildings in the Lambeth Road will be utilised by the company, arrangements to that effect having been come to by the two surveyors engaged.

Great Sanitary Scheme at Fulham.—Next week the Fulham Borough Council will have in full operation one of the most important combined schemes of refuse destruction, electric lighting and disinfection undertaken by a local body in London. Under the existing system the cost of refuse removal by barges is 1s. 11d. per load, which, on an average yearly collection of 40,000 loads, amounts of £3,833. By means of the new destructor the cost, it is believed, will amount to only £2,358, showing a nett profit on the destructor of £1,775. By using the destructor in connection with the new electric lighting works the burning of the refuse will be equal to the consumption of 2,000 tons of coal, which, taken at 16s. a ton, shows a still further profit to this municipal undertaking of £1,600 a year, and a still further saving of £500 a year is estimated to be made by combining the disinfector with the destructor and electric lighting schemes. Allowing 5¼ per cent. as interest on the sinking fund, the estimated net profit on the combined scheme is put down at £2,728 per annum.

Keystones.

Burton Parish Church is to be restored at a cost of £3,500.

Memorial to the Late Dr. Martineau.—A movement is on foot to erect a memorial tablet in Little Portland Street Chapel to the memory of the late Dr. James Martineau, who for fourteen years exercised his London ministry in its pulpit.

A new Roman Catholic Cathedral at Leeds is to take the place of St. Anne's, and will occupy a site between the Masonic Hall and Cookridge Street. It is estimated that the cost of the cathedral, together with that of the presbytery, will be £33,000.

A Discovery of Mural Paintings has been made in the church of St. Peter at Louvain. The frescoes were discovered during the restoration of the church. They are of extreme delicacy, and may be classed amongst the most beautiful in the whole of Belgium.

A Roman Villa Unearthed.—Excavations for road-making close to the railway cutting on Rothley Temple estate, Lord Macaulay's birthplace, near Leicester, have resulted in the discovery of a Roman villa. A whole room has already been laid bare. The foundations are in perfect condition, and from the concrete floor spring several small pillars.

A Memorial to the late Rev. J. Russell Jackson, for thirty-three years vicar of Moulton, near Spalding, and for twenty-two years chairman of the South Holland Quarter Sessions, has been dedicated: it has cost nearly £600, and is in the form of a stained-glass window in Moulton Church and a restored chancel screen.

The Fine Arts Exhibition at Munich.—We are informed that applications will be received until May 1st, but objects of art for exhibition at Munich only between April 10th and May 1st. The architectural changes and adaptations of part of the Glass Palace are being pushed vigorously forward, and no doubt is felt that the exhibition will be complete in every respect on June 1st, the day of its opening.

The Church of All Hallows, North St Pancras, has been erected in one of the most crowded and rapidly growing parts of North-west London. The building was commenced twelve years ago, and was intended to be the permanent Church of the Good Shepherd, but when All Hallows, Thames Street, was pulled down, and the site sold, a portion of the proceeds was given to this church on condition that it was named after the one pulled down. The architect is Mr. James Brooks, and the style is severe Early English. The exterior is of Derbyshire rag and the interior of Portland stone. The cost of erecting the nave and side aisles has been about £17,000, and there is seating accommodation for twelve hundred. When the chancel is added there will be room for an additional three hundred seats.

A Covered Market at Dewsbury is to be erected at Crackenedge Lane.

Budapest and Austrian Builders. — The majority of leading actors and actresses in Budapest have pledged themselves not to accept an engagement in a theatre on which any Austrian architect, builder, decorator, painter, mason, or any kind of labourer had been employed, and a theatre built by the hated foreigners will be rigidly boycotted by nine-tenths of the population of Budapest. This is in consequence of negotiations having been conducted with a firm in Vienna regarding the proposed construction of a new national theatre.

The Glasgow and West of Scotland Technical College Architectural Craftsmen's Society held its usual meeting on Friday evening, January 25th, when Mr. John M. Arthur delivered his paper on "Legal Points for Architects." He divided his subject into two parts, namely: "The Legal Standing of the Architect" and "Legal Points relative to Buildings" leaving out the two subjects of Building By-laws and Conditions of Contract, as these had already been discussed by the Society. The legal standing of the architect in such matters as' "His position as Agent and Arbitrator," "Ordering materials on behalf of his Client," "Certificates," "Ownership of Drawings,' and "Fees," were fully gone into, and law cases bearing on each enunciated. Among his other headings were: "The liability for mishaps during Building," "Mutual Tables of Properties," "Drainage and Water Conveyance," 'Ancient Lights" and "New Charters."

Austrian Art Exhibition.—A committee of Vienna artists and tradesmen have resolved to make arrangements for a great Austrian art trade exhibition in London in 1902 or 1903, under the auspices of the Austrian Government.

"**Jacob Memorial.**"—It is proposed by many of the friends of the late Dr. Archibald H. Jacob, of Dublin, to raise a memorial in testimony of his life-long work in the interests of the profession. Subscriptions may be forwarded to Sir Charles Cameron, C.B, 51 Pembroke Road, Dublin, or L. H. Ormsby, Vice-President R.C.S., 92 Merrion Square West, Dublin, Hon. Treasurers, or to G. F. Blake; Registrar, Royal College of Surgeons, Stephen's Green West, Dublin.

The Autobiography of the late William Simpson, R.I, the prince of special artists in his day (as Archibald Forbes, his comrade in many campaigns, was among the newspaper correspondents) will be published in the spring, or summer, by Messrs. Morrison, the well-known Glasgow publishers. The autobiography was jotted down at odd moments during the last few years of the famous artist's life, not with a view to publication, but as a memento for his family. Mrs. Simpson has consented to the wish of many of her husband's admirers that the memoir should be published. Friends and correspondents of "Crimean Simpson" who may have any letters of his in their possession, or any documents that might be of use to the editor of the autobiography, should lend them, or copies, to Mrs. Simpson, at her address, 19 Church Road, Willesden.

The Ruskin Union.—The first annual meeting of the Ruskin Union will be held at 15 Grosvenor Crescent, Hyde Park Corner, on Friday, February 8th (Ruskin's birthday), at 8.30 p.m. Mr. Hardwick Bond will deliver a lecture on "Ruskin and Literature."

Labourers' Cottages in Mullingar.—A Local Government Board enquiry was recently held into an extensive scheme for the erection of new labourers cottages and the enlargement to one acre of half acre allotments attached to existing cottages in the Mullingar Union. The scheme deals with 270 cases, and the estimated cost of carrying it into effect is close on £20,000. It is proposed to erect about eighty new labourers' cottages and to enlarge the gardens of nearly 200 cottages already erected.

The British Fire Prevention Committee having had many enquiries reach their offices as to whether further important conflagrations abroad could not be made the subject of special publications or papers, in the same way as the Charity Bazaar Fire at Paris and the Horne Building Fire at Pittsburg, U.S.A., have already been dealt with, the executive have decided to issue authentic illustrated descriptions of the Comédie Français Fire at Paris and the Windsor Hotel Fire at New York, in respect to which valuable notes and photographs have for some time been in their possession. Both descriptions will be issued during the spring, and, as only a limited edition will be printed for members of the committee and the public authorities, non-members requiring copies should apply at once to the Assistant Secretary, 1 Waterloo Place, Pall Mall, S.W.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
	BUILDING.		
Feb. 8	Constablee, Rawtenstall, Lancs.—Church	—	Austin and Paley, Architects, Lancaster.
" 8	Fernhurst, Sussex—Schoolroom	School Board	J. Hill, The Cross, Fernhurst.
" 8	Leeds—Stables, Coach House, Saddle Room, &c.	Dr. Sydney Rumbold	F. Mitchell, 9 Upper Fountaine Street, Leeds.
" 9	Carlisle—Church Works	—	Johnstone Bros., 39 Lowther Street, Carlisle.
" 9	Londonderry—Wing	—	E. J. Toye, Architect, Strand, Londonderry.
" 9	Newport, Isle of Wight—Reparations	—	J. B. Colson, 45 Jewry street, Winchester.
" 9	Great Yarmouth—Additions	H. B. Lee	C. G. Baker, Architect, Town Hall Chambers, Great Yarmouth.
" 9	Wrexham—Houses	—	W. H. Bosker, Monumental Chambers, Ruabon Road, Wrexham.
" 9	Harrogate—Restoration of Church	—	Boreham and Morton, 24 John Street, Sunderland.
" 11	Aberberg, Mon.—School	Aberystruth School Board	R. L. Roberts, Victoria Chambers, Abercarn.
" 11	Llanelly—Classrooms, &c.	School Board	J. B. Morgan, Architect, School Board Offices, Llanelly.
" 11	London, S.W.—Home	Union Guardians	E. T. Hall, 57 Moorgate Street, E.C.
" 11	Peterborough—Shops and Showrooms	C. F. Thomson	J. G. Stallebrass, Architect, North Street, Peterborough.
" 12	Whitby—Electric-light Station	Urban District Council	W. S. Gray, Clerk, Council Offices, Whitby.
" 12	London, N.—Water Tower, &c.	Islington Borough Council	A. H. Tiltman, 51 Russell Square, W.C.
" 12	London, W. Generating Station	Shoreditch Borough Council	Kincaid, Waller and Manville, 29 Great George Street, Westminster.
" 12	Dewsbury—Houses	Pioneers' Industrial Society	Holtom and Fox, Architects, Corporation Street, Dewsbury.
" 12	Mount Bellew, Ireland—Improvements	Union Guardians	J. Smith, Architect, Ballinasloe.
" 12	Tonyrefail, Wales—Gallery	—	C. Morse, High Street, Tonyrefail.
" 12	Ilford—Park Pavilion	Urban District Council	H. Shaw, 7 Cranbrook Road, Ilford.
" 13	Dublin—Labourers' Dwellings	Rural District Council	J. O'Neill, Clerk, North Brunswick Street, Dublin.
" 13	London, E.C.—Generating Station	Shoreditch Borough Council	Town Hall, Old Street, E.C.
" 13	New Malden, Surrey—Shop, &c.	—	V. Davison, jun., Architect, Bartley Lodge, New Malden.
" 14	London, N.W.—Foundations for Weighbridge, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, S.W.
" 14	Lowestoft, Suffolk—Boys' Home	London County Council	Architect's Department, County Hall, Spring Gardens, S.W.
" 15	Ashford, Middlesex—Two Board Schools	School Board	Fleetwood, Son and Eversdon, 3 New Court, Lincoln's Inn, W.C
" 15	Limerick—General Offices and Stores	Irish Co-operative Agency Society	B. E. F. Sheehy, 13 William Street Limerick.
" 16	Annfield Plain, Durham—Shops, &c.	Industrial Co-operative Society	G. T. Wilson, 121 Durham Road, Blackhill.
" 18	Darenth, near Dartford—Annexes, &c.	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.
" 18	Kington—Infirmary at Workhouse	Union Guardians	C. S. Delfosse, Architect, Duke Street, Kington, Herefordshire.
" 18	Upper Witton, Staffs.—Smallpox Hospital and Extensions	Aston Manor, Urban District Council	G. H. Jack, Engineer, Council House, Aston Manor.
" 19	London, E.C.—Alterations to Roof	Shoreditch Borough Council	J. R. Dixon, Borough Engineer, Town Hall, Old Street, E.C.
" 19	Kingston-upon-Hull—Erection of School Buildings	School Board	Brodrick, Lowther & Walker, Lowgate Hill, Kingston-upon-Hull.
" 20	Lerwick—School	School Board	R. D. Gansen, Clerk, School Board Offices, Lerwick.
" 21	Liscard, Wallasey—Car Sheds, Stores, &c.	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
" 21	Liscard, Wallasey—Engine and Pump House	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
" 21	Devonport—Alterations	Town Council	Borough Surveyor, 30 Ker Street, Devonport.
" 21	Fernhurst—Infant Schoolroom	School Board	J. Hill, The Cross, Fernhurst.
" 28	Dublin—Lime, &c.	—	Barrack Master, Irish Constabulary Depôt, Phœnix Park, Dublin
" 28	Fir Vale, Sheffield—Workhouse Administrative Block	Sheffield Union Guardians	A. E. Booker, Clerk, Union Offices, West Bar, Sheffield.
" 28	Wrexham—School Buildings	County School Governors	J. H. Phillips, Olive Chambers, Windsor Place, Cardiff.
" 28	Walthamstow—Four Shops and Business Premises	Parochial Charities	W. A. Longmore, Architect, Bridge Chambers, Hoe Street, Walthamstow.
Mar. 4	Felixstowe—Hotel	D. A. Tollemache	T. W. Cotman, Architect, Northgate Street, Ipswich.
" 13	London, S.E.—Infimary	Camberwell Guardians	E. T. Hall, 57 Moorgate Street, E.C.
	ENGINEERING		
Feb. 8	Chesham, Bucks.—Water Supply Works	Urban District Council	J. Taylor, Sons and S. Crimp, 27 Great George St., Westminster.
" 8	Blantyre, Scotland—Sewers, &c.	District Committee	W. L. Douglass, 3 Clydesdale Street, Hamilton.
" 8	Aberdeen—Condensers, &c.	Electric Lighting Committee	J. A. Bell, City Electrical Engineer, Cotton Street, Aberdeen.
" 8	Hull—Dynamo	Works Committee of Corporation	T. G. Milner, Treasurer, Town Hall, Hull.
" 9	Battey—Dynamos	Corporation	Lacy, Clirehugh and Sillar, 2 Queen Anne's Gate, Westminster.
" 9	Edinburgh—Engine and Dynamo	Lord Provost, Magistrates, and Council	Resident Electrical Engineer, Dewar Place Station, Edinburgh.
" 9	Ballinasloe, Ireland—Electric Light	—	J. F. Fuller, 179 Great Brunswick Street, Dublin.
11	Wolverhampton—Crane	Tramways Committee	J. W. Bradley, Borough Engineer, Town Hall, Wolverhampton.
" 11	Brighton—Dam, &c.	Town Council	F. J. C. May, Town Hall, Brighton.
" 11	Cambeltown, Scotland—Waterworks	Water Committee	J. Fullarton, Master of Works, Cambeltown.
" 11	London, N.—Forced Draught Works	Hornsey Urban District Council	E. J. Lovegrove, 99 Southwood Lane, Highgate. N.
" 11	Weston-super-Mare—Widening, &c.	Urban District Council	H. Nettleton, Engineer, Town Hall, Weston-super-Mare.
" 11	Edinburgh—Gasworks, Plant, &c. (10 Contracts)	Gas Commissioners	W. R. Herring, Manager, Gasworks, New Street, Edinburgh.
" 12	Bromley, Middlesex—Electric Light	—	R. Foskett, Clerk to the Managers, Bromley.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	Engineering.—*Continued.*		
Feb. 13	London, S.E.—Plant	Southwood Borough Council	Kincaid, Waller and Manville, 29 Great George Street, Westminster.
„ 13	Aberdeen—Electric Tramways	Tramways Committee	J. A. Bell, City Electrical Engineer, Cotton Street, Aberdeen.
„ 13	Tooting, S.W.—Kitchen Department	Metropolitan Asylums Board	A. and C. Harston, 15 Leadenhall Street, E.C.
„ 14	Brighton—Electric Tramways	Council	T. B. Holliday, Tramways Engineer, Town Hall, Brighton.
„ 14	Brighton—Tramway Feeder Cables	—	J. B. Holliday, Tramways Engineer, Brighton.
„ 15	Valetta, Malta—Arc Lamp Carbons	—	Superintendent of Public Works, Malta.
„ 15	Kirkcaldy—Boilers	Corporation	W. L. Maundoc, Town Clerk, Kirkcaldy.
„ 15	Halesowen—Various	Hospital Committee	A. T Butler, Architect, Cradley Heath.
„ 15	Stirling—Plant	Town Council	T. L. Galbraith, Town Clerk, Stirling.
„ 16	Croydon—Boilers	Town Council	Borough Electrical Engineer, Factory Lane, Croydon.
„ 16	Walsall—Purifiers, &c.	Gas Committee	B. W. Smith, Pleck Gasworks, Walsall.
„ 18	Long Eaton—Elecricity Plant	Urban District Council	F. Worrall, Council Offices, Long Eaton.
„ 18	Brigstock, Northants—Well	Parish Council	B. Thompson, Northampton.
„ 18	Coventry—Heating, &c.	—	City Engineer, Town Hall, Coventry.
„ 18	Wimbledon—Boilers, &c.	Urban District Council	F. B. Spencer, Electrical Engineer, Durnford Road, Wimbledon
„ 19	Swansea—Heating	School Board	A. W. Halden, Clerk, Dynever Place, Swansea.
„ 19	London, S.W.—Water-tube Boilers	L.C.C. Tramways	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 19	Cellyhurst, Manchester—Connecting Lines	Lancashire and Yorkshire Railway Co.	Engineer's Office, Hunt's Bank, Manchester.
„ 19	Headington—Temporary and Stone Bridges	Rural District Council	L. Turner, Surveyor, Hartfield Cottage, New Headington, Oxon.
„ 21	Bristol—Coal Conveyor, &c	Electrical Committee	H. F. Proctor, City Electrical Engineer, Temple Back, Bristol.
„ 21	Huelva, Spain—Telephone System	—	Commercial Department of the Foreign Office, Whitehall, S.W.
„ 22	Glasgow—Car Equipments	Corporation	J. Young, 88 Renfield Street, Glasgow.
„ 25	Beckenham—Electricity Plant	Urban District Council	R. P. Wilson, 66 Victoria Street, Westminster.
„ 28	Wanstead, N.E.—Concrete Tanks, Sewage Filters, &c.	Urban District Council	J. T. Bressey, Surveyor, Council Offices, Wanstead, N.E.
„ 28	Wellington, New Zealand—Engines	Corporation	J. Duthie & Co., Limited, 23 Lime Street, London, E.C.
Mar. 2	Bournemouth—Electric Cars	Town Council	F. W. Lacey, Borough Engineer, Municipal Buildings, Bournemouth
„ 2	East Dereham—Purifiers	Urban District Council	H. Kitson, Gasworks, East Dereham.
„ 4	Luton—Wiring	Town Council	Borough Engineer, Luton.
„ 4	Lincoln—Boring	Waterworks Committee	P. Griffith, 54 Parliament Street, Westminster, S.W.
„ 11	Santandar, Spain—Floating Dredger	Committee of Works	Corporation Offices, Santander.
April 1	Amsterdam—Electrical Plant	Burgomaster en Werthouders	Director, Town Printing Works, Achterburgwal 213, Amsterdam.
„ 10	Rosario—Harbour Works	Argentine Government	Commercial Department, Foreign Office, S.W.
	IRON AND STEEL.		
Feb. 9	Downpatrick, Ireland—Tanks	Guardians	R. L. Morrow, Clerk to the Guardians, Downpatrick.
„ 9	Belfast—Castings, Ironmongery, Bolts, &c.	Belfast and Northern Railway Company	Mr. Ellis, Stores Superintendent, York Road Station, Belfast.
„ 12	Glasgow—Pipes	Corporation	W. A. Chamen, 75 Waterloo Street, Glasgow.
„ 14	London, S.W.—Nails, Hoops, &c.	—	Director of Navy Contracts, Admiralty, S.W.
„ 15	Valetta, Malta—Joists	—	Superintendent of Public Works, Malta.
„ 16	Torquay—Ironmongery, &c.	Water Committee	W. Ingham, Water Engineer, Torquay.
„ 20	Sheffield—Two Iron Staircases	Wadsley Asylum Committee	Clerk of Works, Wadsley Asylum, Sheffield.
„ 21	London, S.W.—Ironmongery, Lamps, &c.	—	Director of Navy Contracts, Admiralty, S.W.
„ 22	Glasgow—Rails	Corporation	J. Young, 88 Renfield Street, Glasgow.
	PAINTING AND PLUMBING.		
Feb. 11	Redruth—Painting, Plumbing, &c.	United Methodist Trustees	S. Hill, Architect, Green Lane, Redruth.
„ 12	Castleford—Cleaning and Painting	Primitive Methodist Trustees	J. Townend, Secretary, Pontefract Road, Castleford.
„ 18	Darenth, near Dartford—Painting, Plumbing, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, S.W.
	ROADS AND CARTAGE.		
Feb. 8	Chelmsford—Granite	County Council	Chief Surveyor, County Offices, Chelmsford.
„ 9	Warwickshire—Main Road Material	County Council	J. Wilmott, County Surveyor, Birmingham.
„ 9	Baildon, Yorks.—Street Works	Urban District Council	J. E. Pickard, Surveyor, Council Offices, Baildon.
„ 9	Bedford—Materials, &c.	County Council	County Surveyor, Shire Hall, Bedford.
„ 9	Isle of Ely—Materials	County Council	H. F. Simpson, County Surveyor, Northern Division, Wisbech.
„ 9	Woodbridge, Suffolk—Materials	Rural District Council	G. Cook, Surveyor, New Street, Woodbridge.
„ 9	Midhurst, Sussex—Materials	Rural District Council	A. G. Gibbs, Council Offices, Midhurst.
„ 11	Church, Lancs.—Paving	Urban District Council	W. C. Wood, Surveyor, District Council Offices, Church.
„ 11	Leamington—Road Works	Corporation	W. Normanville, Borough Surveyor, Town Hall, Leamington.
„ 11	Banbury—Stones	Rural District Council	E. L. Fisher, Clerk, Horse Fair, Banbury.
„ 12	Lutterworth—Granite	Rural District Council	J. C. Coates, District Surveyor, Lutterworth.
„ 12	London, S.E.—Kerbing, Tarpaving, &c. (4 Contracts)	Lewisham Borough Council	Surveyor, Town Hall, Catford, S.E.
„ 12	London, N.E.—Materials	Willesden District Council	O. C. Robson, Engineer, Public Offices, Dyne Road, Kilburn, N.W.
„ 12	Mansfield—Making-up	Corporation	R. M. Vallance, White Hart Chambers, Mansfield.
„ 12	West Ham, E.—Materials	Borough Council	Borough Engineer, Town Hall, Stratford, E.
„ 13	East Retford—Materials	Rural District Council	T. Henry, Surveyor, Retford.
„ 13	Birkenhead—Road Materials	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
„ 13	Birkenhead—Street Watering, &c.	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
„ 13	Harrington, Cumberland—Street Improvements	Urban District Council	C. W. Eaglesfield, Surveyor, Council Offices, Harrington.
„ 13	London, S.W. Watering, &c.	Crown Estate Paving Commissioners	Lodge, Park Square West, Regent's Park.
„ 13	Twickenham—Street Works	Urban District Council	F. W. Pearce, Surveyor, Town Hall, Twickenham.
„ 13	London, S.W.—Materials, &c.	Battersea Borough Council	J. T. Pilditch, Surveyor, Municipal Buildings, Lavender Hill, S W.
„ 14	London, S.E.—Materials	Lambeth Borough Council	H. Edwards, Borough Engineer. Town Hall, Kennington Green, S.E.
„ 16	Chelmsford—Tram Labour	County Council	P. J. Sheldon, Chief Surveyor, County Offices, Chelmsford.
„ 16	Plymouth—Granite, Kerb Setts, &c.	—	J. Paton, Borough Engineer, Plymouth.
„ 16	Boston, Lincs.—Granite, &c.	County Council	H. C. Johnson, Sessions House, Boston.
„ 16	Headington, Oxford—Materials	Rural District Council	L. Turner, Hartfield Cottage, New Headington.
„ 18	Hertfordshire—Materials, &c.	County Council	U. A. Smith, 41 Parliament Street, Westminster.
„ 18	Hendon, N.W.—Materials, Sewering, &c. (two contracts)	Urban Borough Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
„ 18	Essex—Broken Granite	County Council	Chief Surveyor, County Offices, Chelmsford.
„ 19	London, S.W.—Materials	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
„ 23	Lewes—Materials, &c.	County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
„ 27	Hailsham—Materials, &c.	Rural District Council	E. Catt, Clerk, Church Street, Willingdon.
March 4	London, N.—Works and Materials (14 contracts)	Hornsey Urban District Council	E. J. Lovegrove, Engineer to the Council, Southwood Lane, Highgate.
„ 6	South Shields—Materials	Corporation	S. E. Burgess, Borough Engineer, Chapter Row, South Shields.
	SANITARY.		
Feb. 8	Durham—Sewers, &c.	Rural District Council	G. Gregson, 39 Saddler Street, Durham.
„ 9	Midgley, Yorks.—Drainage Works	Urban District Council	J. Waugh, Sunbridge Chambers, Bradford.
„ 12	Annfield Plain, Durham—Scavenging	Urban District Council	T. J. Trowsdale, Inspector, Annfield Plain.
„ 12	London, S.W.—Extension of Sewers	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 14	Kirkcaldy—Sewers	District Committee	W. D. Sang, Kirkcaldy.
„ 16	Evesham—Sewerage Works	Corporation	R. E. W. Bevington, Bank Buildings, Wolverhampton.
„ 25	Withington, Lancs.—Sewers	Urban District Council	A. H. Mountain, Engineer to the Council, Town Hall, Withington.
Mar. 4	London, N.—Works and Materials (14 contracts)	Urban District Council	E. J. Lovegrove, Engineer to the Council, Southwood Lane, Highgate.
„ 7	Cannock, Staffs—Sewage Works	Urban District Council	Council Offices, Cannock.
	TIMBER.		
Feb. 8	Douglas—Timber	Corporation	A. Robertson, Town Clerk, Town Hall, Douglas.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Feb. 9	Donaghadee—Water Supply and Sewerage System	—	J. Colville, Clerk. Newtownards R.D.C., Workhouse, Newtownards.
„ 13	Bristol—Alterations, &c., to Petty Sessional Court	£100, £50	P. Addie, City Valuer, Market Chambers, Bristol.
„ 14	Ballarat, Australia—Statue	—	J. W. Nedwell, Hon. Sec., Soldiers' Statue Fund, Ballarat, Australia.
March 25	**Basford—Sewerage Scheme**	—	**C. J. Spencer, Clerk, Public Offices, Basford.**

CURRENT PRICES.

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.	1	12	8		—	
Colza Oil, English ..	do.	1	9	9		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	0	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels ..	do.	1	9	6		—	
Petroleum, American ..	per gal.	0	0	6¼	0	0	6⅜
Do. Russian ..	do.	0	0	5¾	0	0	6¼
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	2	19	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	5	6	1	6	0
Tar, Stockholm	per barrel	1	8	0		—	
Turpentine	per cwt.	1	9	0		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	86	0	0		—	
Iron, Staffs., bar	do.	7	0	0	9	0	0
Do Galvanised Corrugated sheet ..	do.	11	10	0	11	15	0
Lead, pig, Spanish ..	do.	15	5	0	15	7	6
Do. do. English common brands..	do.	15	17	6		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	21	0	0	22	0	0
Do. pipe	do.	23	0	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do., floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	7	0	0	7	10	0
Do. Mild Bars	do.	7	10	0	8	0	0
Tin, Foreign	do.	121	5	0	123	12	6
Do. English ingots ..	do.	126	0	0	127	0	0
Zinc, sheets, Silesian ..	do.	22	10	0		—	
Do. do. Vieille Montaigne	do.	23	2	6		—	
Do. Spelter	do.	18	1	3	18	15	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel..	per load	3	0	0	4	0	0
Pine, Quebec Yellow ..	do.	4	7	6	6	0	0
Do. Pitch	do.	2	14	0	3	17	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	0
Do. Petersburg ..	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P. Std.	13	10	0	17	5	0
Do. do. 4th & 3rd	do.	9	5	0	13	15	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	15	0	15	5	0
Do. do. 2nd ,,	do.	8	15	0	14	15	0
Do. do. Unsorted ,,	do.	5	5	0	13	0	0
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	8	10	0	13	10	0
Do. White Sea ..	do.	10	15	0	14	15	0
Do. Quebec Pine, 1st..	do.	23	10	0	27	5	0
Do. do. 2nd	per P. Std.	19	5	0		—	
Do. do. 3rd &c.	do.	13	15	0		—	
Do. Canadian Spruce, 1st	do.	16	15	0		—	
Do. do. 3rd & 2nd	do.	8	10	0	10	15	0
Do. New Brunswick..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	6	17	6	10	10	0
Flooring Boards, 1in. prepared, 1st ..	per square	0	11	6		—	
Do. 2nd ..	do.	0	9	5		—	
Do. 3rd &c. ..	do.	0	8	9	0	9	9

HARD WOODS

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba ..	per ft. sup.	0	0	4		—	
Do. Honduras ..	do.	0	0	3 29/32		—	
Do. Tobasco	do.	0	0	3 4/16		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0	0	4 21/32		—	
Do. African ..	do.	0	0	3 13/16		—	
Do. St. Domingo	do.	0	0	6⅜		—	
Do. Tobasco ..	do.	0	0	4 17/32		—	
Do. Cuba ..	do.	0	0	4 11/32		—	
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks ..	do.	8	5	0	13	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American ..	per cub. ft.	0	3	1		—	

CONTRACTS OPEN.

WALTHAMSTOW PAROCHIAL CHARITIES.

TO BUILDERS, &c.

The Trustees of the above Charities are prepared to receive TENDERS for the ERECTION of FOUR SHOPS and OFFICE PREMISES upon a site situate at the corner of Wood Street and Wyatt's Lane, Walthamstow, the drawings and specifications for which may be seen at the Office of the Architect, Mr. W. A. LONGMORE, F.R.I.B.A., Bridge Chambers, Hoe Street, Walthamstow, on and after FEBRUARY 4th prox., between the hours of TEN a.m. and FOUR p.m, (except on Saturdays).

Tenders to be sent to the undersigned not later than FOUR p.m. on THURSDAY, the 28th FEBRUARY prox., sealed and endorsed "Tender for New Shops and Office."

The Trustees do not bind themselves to accept the lowest or any Tender.

GILBERT HOUGHTON,
Clerk to the Trustees.

Bridge Chambers,
No. 195 Hoe Street, Walthamstow,
January 1901.

N.B.—The conditions to be complied with as to the hours of labour and rates of wages can be seen at the Office of the Architect.

TO BUILDERS.

The Guardians of the Poor of the Parish of St. Giles, Camberwell, are prepared to receive TENDERS for the EXTENSION and COMPLETION of their INFIRMARY in Brunswick Square and Havil Street, Camberwell, to be executed from the designs of Mr. EDWIN T. HALL, F.R.I.B.A., Architect, 57 Moorgate Street, E.C.

Builders desirous of Tendering can obtain bills of quantities, prepared by Messrs. LEANING and SON, from the Architect upon paying a deposit of £10 10s., which deposit will be returned on receipt of a bonâ-fide Tender.

Drawings, specifications, &c., may be inspected at the Architect's offices after the quantities are sent out.

The contractor whose Tender is accepted, and with whom a contract is entered into, will be required to enter into a bond with two approved sureties for the sum of £10,000, and will be required to pay the whole of his workmen engaged upon the works such rate of wages and observe such hours of labour as are recognised by the workmen's trade unions.

Tenders, addressed to the Board of Guardians, sealed and endorsed "Tender for Infirmary Extension, to be delivered to the undersigned not later than TWELVE o'clock noon on WEDNESDAY the 13th MARCH, 1901.

The Guardians do not bind themselves to accept the lowest or any Tender.

CHARLES S. STEVENS,
Clerk to the Guardians.

Guardians' Offices,
No. 29, Peckham Road, S.E.,
January 1901.

METROPOLITAN BOROUGH of SHOREDITCH.

The Council invite TENDERS for certain ALTERATIONS to the ROOF over the Reference Room of the Hoxton Public Library, Pitfield Street, N., including the provision of lantern lights over domes, and the covering of the whole flat with lead.

The drawings, specification and conditions of contract may be inspected, and form of Tender obtained at the office of Mr. J. RUST DIXON, A.M.Inst.C.E., Borough Engineer, Town Hall, Old Street, E.C., upon depositing the sum of 10s. 6d., which amount will be returned upon receipt of a bonâ fide Tender.

An approved surety must be given to enter into a bond of £250 as security for the Contract.

Trade union rate of wages and hours must be observed.

Sealed Tenders, upon the printed form supplied, endorsed "Library Roof," must be delivered at my Office by NOON on TUESDAY, the 19th FEBRUARY next.

The lowest or any Tender will not necessarily be accepted.

By order,
H. MANSFIELD ROBINSON,
Town Clerk.

Town Hall,
Old Street, E.C.,
January 1901.

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17½×3×2	8 11	8 2	14 6
17½×3×1½	6 10	6 3	10 9

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To Architects, Builders, Show-case Manufacturers and others.
In consequence of the completion of the new permanent building for HORNIMAN'S MUSEUM, LONDON ROAD, FOREST HILL,

MR. HAROLD CARPMAEL has been instructed to SELL by AUCTION in the grounds of SURREY MOUNT at the rear of the Museum on FEBRUARY 13th, 1901, at TWELVE o'clock precisely :—

A substantially-erected GALVANISED IRON BUILDING about 100ft. by 30ft., match-boarded throughout with timber floor and joists, in excellent condition. An imposing iron Verandah with spiral staircase, two open heating stoves with cast-iron flues, TWO SELF-REGISTERING TURNSTILES by Norten and a ditto by Slark. A large number of well made and handsome SHOW CASES, CABINETS, SPECIMEN CASES and DRAWERS of all sizes and descriptions. Fifty glass shades and stands, &c. Also a small quantity of Builders' materials including scaffold poles and boards, putlogs, &c.

On view TUESDAY, February 12th, and morning of sale.

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HAMPTON AND SONS are instructed to offer the above SITES for SALE by AUCTION, at the Wimbledon Hill Hotel, Wimbledon, on SATURDAY, FEBRUARY 16th, 1901, at 2 o'clock precisely.

Full particulars, with Conditions of Sale and Sectional Plans, may be obtained from the Vendor's Solicitors, Messrs. HORNE and BIRKETT, 4 Lincoln's Inn Fields, W.C.; of the Architects to the Estate, Messrs. HUBBARD and MOORE, 85 Gresham Street, E.C.; and of the Auctioneers, Messrs. HAMPTON and SONS, Ltd., 1 Cockspur Street, Pall Mall, S.W., and at their Branch Office on the Estate, High Street, Wimbledon Common.

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Registered December 22nd, 1900, to acquire a piece of land in the county of Lancaster known as Carr House Farm, to adopt an agreement with the Fleetwood Estate Company, Limited, and to carry on the business of landowners, builders, decorators, contractors, brickmakers, brick, timber, and hardware dealers, sawmill proprietors, sawyers, shipbuilders, shipowners, farmers, &c. Capital £15,000 in £1 shares.

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Registered December 24th, 1900, to acquire the business recently carried on by J. R. Smiles, at Middlesbrough, to acquire the stocks of cement belonging to and the current contracts with reference to the purchase and sale of cement entered into by Harris, Thomas and Co., Limited, of the Docks, Middlesbrough, and to carry on the business of manufacturers of and dealers in cement, concrete, plaster, ground-slag, lime, plaster of Paris, whiting, &c. Capital £7,500 in £1 shares.

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Registered December 31st, 1900, to acquire the business of brickmakers now carried on by A. Ludovic, Limited, near Ramsgate; to acquire from them certain interests in estates near Ramsgate; to acquire from F. A. L. de Clercq and A. V. E. de Clercq certain properties near Ramsgate, and to carry on the business of brick and tile makers, lime burners, builders, contractors, stone, sand, lime and brick merchants, timber merchants, &c. Capital £50,000 in £1 shares (45,000 preference). The first directors are F. A. Ludovic de Clercq and A. E. V. de Clercq. Registered office: 21 Lime Street, E.C.

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Registered December 27th, 1900, to acquire as a going concern the business and undertaking of merchants, dealers in and importers of wall papers and other paper hangings, cordelova, lignomur, anaglypta, lincrusta, Japanese papers, and other kinds of paper, mouldings, and allied substances carried on at Nos. 51, 52, and 53 Berners Street, Oxford Street, under the style of Arthur Sanderson and Sons. Capital £120 000 in £1 shares. The first directors are J. W. Sanderson, A. B. Sanderson and H. W. Sanderson. Registered office: 52 Berners Street, Oxford Street, W.

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Registered January 11th, with 250 members, each liable for 1s. The first directors are E. C. Milligan, F. Rowland, J. Crabbe, J. W. Potter, J. Thorpe and J. Banks.

Swansea Brickworks Company, Limited.

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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the Work.

CLITHEROE, Lancs.—For the erection of a steel girder and concrete bridge over Mearley Brook, with the necessary retaining walls, &c.; also for widening sewer, filling-up, forming, excavating, macadamising, channelling, flagging, &c., Wilkin Street, for the Corporation. Mr. Arthur R. Bleazard, borough surveyor:—

T. Rowland, Sandiway, Northwich	£3,997	15	6
Thornber and Dixon, Clitheroe	2,090	0	0
J. Bleazard, Clitheroe*	2,025	18	3

* Accepted.

DUNOON, Scotland.—For road and other improvement works near the Balgie Burn, West Bay, in connection with the removal of the present cast-iron bridge and erection of a new steel bridge, for the Commissioners. Mr. Mackintosh, C.E., burgh engineer:—

A. Stark and Sons, Glasgow	£1,769	9	6
A. King, Houston	1,638	18	4
D. Watson, Glasgow	1,683	18	2
H. McDougall, Dunoon	1,370	7	9
A. Duncan, Glasgow	1,347	1	0
T. Scott, Rutherglen	1,341	10	2
W. Whitelaw, Dunoon	1,301	18	3
C. Wilkie, Kirn	1,301	2	2
R. Aitkenhead and Son, Greenock	1,276	3	6
R. C. Brebner and Co., Edinburgh	1,070	8	7
D. Cunningham and Son, Kilmalcolm	1,016	15	6
A. A. R. Lang, Gourock*	869	1	2

* Accepted.

GREENWICH.—For the erection of new staircases, and various alterations at Morton's Theatre, Greenwich, for Mr. Arthur Carlton and co-directors. Mr. Alfred Roberts, architect, 18 Nelson Street, Greenwich, S.E.:—

Lole & Lightfoot	£1,963	H. Groves	£1,779
W. Mills	1,798	T. D. Leng*	1,670

* Accepted.

HURST, near Ashton-under-Lyne.—For street works, Queen Street, &c., for the Hurst Urban District Council. Mr. Samuel Sluit, surveyor:—

I. Powell	£4,778	0	0
J. and J. Woodhead, Ashton-under-Lyne*	4,521	10	8

* Accepted.

LEIGH-ON-SEA.—For making up, kerbing, channelling, and paving roads. Messrs. Smee, Mence & Houchin, architects and surveyors, 12 West Smithfield, London, E.C.:—

Lowest Tenders in Competition.

Harris & Rowe:			
Leighville Grove	£818	7	4
Southsea Avenue	752	0	1
Lymington Avenue	749	13	2
Cranleigh Drive	983	1	11
Marine Parade	1,049	11	3
William Iles:			
Cliff Road	£1,205	0	0
North Street	210	0	0
West Street	556	0	0
East Street	282	0	0
Alexandra Street	282	0	0
Ashleigh Drive	341	0	0
Redcliff Drive	449	0	0

LONDON, Highway Graded School (St. George's-in-the-East).—For sanitary and drainage works, for the London School Board. Mr. T. J. Bailey, architect:—

Munday & Son	£3,428	0	0	Killingback & Co.	£2,942	0	0
Godson & Sons	3,384	19	0	Stevens Bros.	2,814	15	4
Martin, Wells & Co.	3,058	0	0	Ashby & Horner*	2,499	0	0
Johnson & Co., Ltd.	3,046	0	0				

* Accepted.

LONDON, Globe Terrace School (Bethnal Green).—For sanitary and drainage works, for the London School Board. Mr. T. J. Bailey, architect:—

Godson & Sons	£3,218	11	2	Lawrance & Sons	£2,591	0	0
Martin, Wells & Co.	2,937	0	0	Johnson & Co.	2,526	0	0
Killingback & Co.	2,928	0	0	Williams & Son	2,495	0	0
Steven Bros.	2,775	0	0	F. Bull*	2,352	0	0
Willmott & Sons	2,694	0	0				

* Accepted.

MEXBOROUGH, Yorks.—For the erection of (a) engine-room and battery-room; (b) destructor buildings, approach, stables, &c.; (c) brick chimney 120ft. high, for the Mexborough Urban District Council. Mr. G. Fenwick Carter, C.E., surveyor:—

B. Graham & Son, Huddersfield	£4,835
Sprakes & Son, Doncaster	4,565
G. H. Smith, Mexborough*	4,100

* Accepted.

PEMBERTON, Lancs.—For building engine-house, boiler-house, tall chimney, &c., for their electricity generating station, for the Pemberton Urban District Council. Messrs. Heaton, Ralph & Heaton, Wigan, architects:—

W. France, Newtown, Wigan	£4,890
J. Johnson & Son, Caroline Street, Wigan	4,825
A. Bywater, Pemberton Sawmills, near Wigan	4,288
W. Winnard, Wallgate, Wigan	4,286
D. A. Ablett, Sovereign Road Sawmills, Wigan	3,914
A. Wigan, Rose Bridge, Ince, Wigan	3,870
T. & H. Houghton, Warrington Road, Newtown, Wigan*	3,694
J. Wilson & Co., Caroline Street, Wigan	3,585

* Accepted.

SALTASH, Cornwall.—For repairing roads, boundary walls, &c., on the Port View Estate for the Trustees. Mr. Edgar M. Leest, surveyor, Devonport and Saltash:—

W. E. Blake, Plymouth	£857	0	0
J. Coles, Plymouth	528	2	5
W. H. Rothery, Saltash	415	0	0
Taylor & Mutton, Saltash	375	15	0
W. C. Shaddock, Plymouth*	337	2	8

* Provisionally accepted.

COMING EVENTS.

Wednesday, February 6.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. E. J. Steegmann, M.B., D.P.H., on "The Atmosphere, Pressure, and Composition; Air; Combustion, and Respiration," 7 p.m.

British Archæological Association.—Meeting at 8 p.m.

Northern Architectural Association.—Mr. Robert A. Wood, B.S., M.E., on "Luxfer Prisms and Prismatic Lighting Theory and Application," 7.30 p.m.

Ruskin Society of Birmingham.—Mr. Michael E. Sadler, M.A., on "Dr. Arnold of Rugby. What is his message to our own time?" 8 p.m.

Geological Society of London.—Meeting at 8 p.m.

Royal Archæological Institute of Great Britain and Ireland.—Professor T. McKenny Hughes, M.A., F.R.S., on "The Natural Forms which have Suggested some of the Commonest Implements of Stone, Bone and Wood;" and Dr. S. Russell Forbes on "Recent Excavations in the Forum at Rome," 4 p.m.

Builders' Foremen and Clerks of Works Institution.—Ordinary meeting at 8 p.m.

Thursday, February 7.

Civil and Mechanical Engineers' Society.—Mr. M. Mawson, A.M.I.C.E., on "A Description of the Staines Reservoir Works," 8 p.m.

Society of Antiquaries of London.—Meeting at 8.30 p.m.

Chemical Society.—Meeting at 8 p.m.

Society of Architects.—Mr. Raymond Unwin on "The Art of Designing Small Houses and Cottages," 8 p.m.

Friday, February 8.

Architectural Association.—Mr. D. T. Fyfe on "Cretan Architecture," 7.30 p.m.

Birmingham Architectural Association.—Mr. Banister F. Fletcher, A.R.I.B.A., on "The Architecture of the 20th Century," 6.45 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. W. Marriott on "Meteorology," 7 p.m.

Physical Society.—Annual General Meeting at 5 p.m.

Glasgow and West of Scotland Technical College Architectural Craftsmen's Society.—Lectures on "Wall Coverings: Mr. Colin Sinclair on 'Limes,' Mr. R. W. Horn on 'Cements,' and Mr. John Arthur on 'Patent Plasters,'" 8 p.m.

Institution of Junior Engineers.—Mr. Louis F. Awde on "Electric Power Supply in the Metropolis," 8 p.m.

Institution of Mechanical Engineers.—Adjourned Discussion on Mr. Humphrey's Paper on "Power Gas and Large Gas Engines for Central Stations," 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. Wimperis on "Cycle Resistance," 8 p.m.

Architectural Association of Ireland.—Technical Demonstration at No. 42 Grafton Street, Dublin: Mr. J. F. Keatinge on "Painting, Varnish, Wall-papers, &c.," 4.30 p.m.

Saturday, February 9.

Dundee Institute of Architecture.—Mr. J Donald Mills on "Warwick and Staffordshire Architecture," 7 p.m.

Edinburgh Architectural Association.—Visit to Royal High School, Canongate Parish Church and Old Tolbooth, Edinburgh.

North of England Institute of Mining and Mechanical Engineers, Newcastle-on-Tyne.—Council Meeting at 1.30 p.m.; General Meeting at 2 p.m., Mr. William Tattley on "Sinking through Swamp, Clay and Sand."

Builders' Foremen's Association.—Annual Dinner, King's Hall, Holborn Restaurant.

Monday, February 11.

Surveyors' Institution.—Adjourned Discussion on Mr. R. E Middleton's paper on "The Future of the London Water Supply," 8 p.m.

Philosophical Society of Glasgow: Architectural Section.—Mr. James Craig Annan on "The Arts of Engraving, 8 p.m.

Bristol Society of Architects.—Mr. C. H. Samson on "Church Restoration," 8 p.m.

Tuesday, February 12.

Royal Institution.—Professor J. A. Ewing on "Practical Mechanics," V., 3 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. J. Priestley, B.A., M.D., on "Sanitary Law," 7 p.m.

Edinburgh Architectural Association.—Evening Visit to Edinburgh City Observatory.

Society of Arts (Applied Art Section).—Mr. William Buxton on "Recent Advances in Pottery Decoration, 8 p.m.

Wednesday, February 13.

Edinburgh Architectural Society.—Mr. Jame A. Arnot on "Notes on a Holiday Tour in Belgium and Holland."

Institute of Sanitary Engineers.—Meetings of Examination and Literary Committee at 3 p.m.; General Purposes and Finance Committee at 4 p.m.; Election Committee at 5.15 p.m., and Members' Sessional Meeting at 7 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers: Part I. Inspection and Demonstration at Lambeth Disinfecting Station, Wanless Road, Loughborough Junction, at 3 p.m.

Thursday, February 14.

Sheffield Society of Architects and Surveyors.—Mr. H. H. Statham, F.R.I.B.A., on "Our Cathedral Fronts: a Comparative Criticism."

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers: Part I.—Mr. J. Priestley, B.A., M.D., on "Sanitary Law," 7 p.m.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

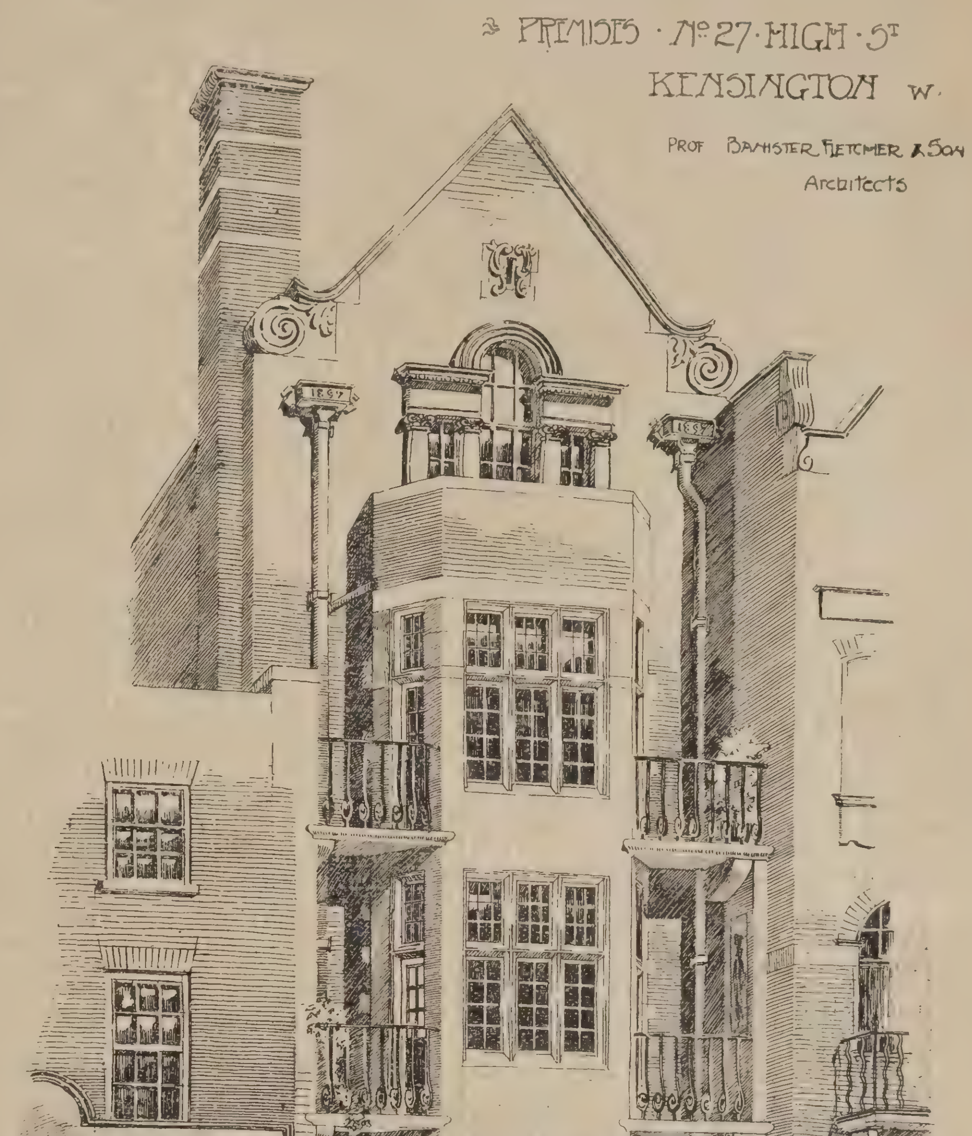
FEBRUARY 13, 1901.
No. CCCXIV.

EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

An Architectural Causerie.

Holborn-Strand Designs. THE London County Council are very reticent about the competition in connection with the new street to be formed from Holborn to the Strand, and it is most difficult to ascertain what they propose to do in the matter. It is now four months since the designs were on exhibition at the Royal Water-colour Society's gallery in Pall Mall, but the report of Mr. Norman Shaw is still withheld, though architects are anxious to know its recommendations. On December 18th the designs of Mr. Ernest Runtz for the new Gaiety Theatre and Restaurant (which will form the western end of the central block) were passed, and it was feared that the intention of securing a fine architectural scheme had thus been abandoned and that the work was going to be done piecemeal. Such a conclusion was the more probable as Mr. Runtz's design (No. 17) was not the most generally favoured in the competition. It is now stated, however, that the Council have decided to proceed with the scheme, and that the designs of Mr. Henry T. Hare, F.R.I.B.A. (No. 26), have been adopted. We have already published the whole eight designs submitted, and if our readers will refer to our issues for November 7th and 21st last they will at once see that the idea of combining these two designs, as submitted, is not likely to produce a satisfactory result. The amount of remodelling necessary would practically mean a new design. It is very desirable that the Council should make public their intention in regard to this scheme. Mr. Shaw's report should be published; we might then have an idea of what is proposed to be done, for it is assumed that the Council have observed his decision, not disregarded it as in the case of the recent Infirmary competition at Glasgow.

Tapestries. THE litigation which has arisen over the Luton Hoo tapestries affords a striking example of the difference of opinion on points of law which may exist even among the most eminent judges. The late Madame de Falbe left among her property ten valuable French tapestries in the mansion at Luton Hoo, and the dispute arose as to whether these were fixtures or personal chattels. Three of the tapestries were in the hall, and were enclosed in large oak frames attached to the walls by means of small brass and iron plates. A rule could be passed between them and the wall, and they were hung in the same way as heavy pictures or pier glasses. Mr. Justice Byrne had held in the lower court that these tapistries were not permanent additions to the house but were personal chattels, and it was only in respect of the remaining seven that the appeal was heard. These latter were in the drawing-room (they were said to be worth £7,000) and were fixed by being tacked to canvas which was itself stretched and nailed over strips of wood fixed to the walls. White and gold mouldings were also fixed round them. Mr. Justice Byrne thought that wallpapers and panelling could under no circumstances be taken away, and so held that these tapestries were similar fixtures. Lord Justice Rigby, however, said that if there was a paper on the wall which a tenant for life did not like he could remove it. He pointed out that time was when anything fixed to the freehold was held to go with the freehold, and it was only by slow degrees that that unbending rule was modified. But there were exceptions, one of which entitled a person who had put up fixtures for trade purposes to remove them. He therefore held that these tapestries were not fixed for enhancing the value of the freehold, but for purposes of ornamentation. The other learned Lords agreed with him, and so Mr. Justice Byrne's decision was reversed.



LONDON STREET ARCHITECTURE (*see page* 35).

G. BERTRAM BULMER, F.R.I.B.A.

MEN WHO BUILD.

No. 62.—G. BERTRAM BULMER, F.R.I.B.A.

In these days of startling originality and individualism it is exhilarating to see the work of an architect who is willing to follow the old traditions of architecture. Mr. G. B. Bulmer has very little sympathy with the modern "romantic" school, which, casting aside all precedent, attempts to form a new style of architecture with almost mushroom growth. Yet he disapproves the practice of the architect who follows—or rather copies—the old styles feature for feature and mould for mould, who cramps his accommodation in order that a certain part of the composition may be central, or places windows and other features where they are not required, so that they may form an elevation true to Palladio.

Mr. Bulmer was born in Leeds in 1851 at the Assembly Court, an interesting Georgian house formerly situated on the site of the present Corn Exchange, Kirkgate. He was educated privately and at the Leeds Grammar School, and was then articled to the firm of Messrs Perkin and Son, of Leeds; and he has been in partnership with the remaining member of the firm, Mr. Henry Perkin, F.R.I.B.A., since 1877. Mr. Bulmer has written several papers on professional subjects, both scientific and artistic, such as "Sanitation," "Wakefield Town Hall," "To Ancient Rome," &c.; he also edited "Historical Notes of the Baronial House of Bulmer," by W. Dickon Hoyle, published in 1896.

As a student he was a very prolific sketcher, and tramped the country with knapsack and measuring rod, making sketches and measured drawings of anything which he thought was worth delineating. The outcome of this was a book, which he published in 1887, entitled, "Architectural Studies in Yorkshire;" it consists of a selection of his sketches, drawn in a very vigorous manner, with a short description to each and a few of the main dimensions. This book has been a very valuable one to Yorkshire students, teaching them to study the characteristics of their own county, where they would probably begin to practise.

In addition, Mr. Bulmer is a very good painter in oil and water-colour. His great love of nature is seen in his studies of animals of all kinds—in fact, this is evident in his buildings, the motifs for the ornamented features, such as corbels and stops, &c., being almost always taken from the animal world. He has also drawn a good deal from the life, a study which affords a splendid tuition in proportion. Furniture and decoration have also been the subjects of extensive studies by him. The Leeds and Yorkshire Architectural Society has found a very enthusiastic worker in Mr. Bulmer, who was honorary secretary from 1883 to 1887 and president in 1892. He has also been for many years a working member of the Leeds Fine Arts Club, a private society for the cultivation of the fine arts.

Mr. Bulmer's method of design is very interesting and instructive. He makes a special point of not consulting the work of other architects, neither does he design in one style and then pass to another; but choosing one he develops it for each building he erects. This continuity of style is best evidenced in his design for the Yorkshire Penny Bank at Halifax, for which Messrs. Perkin and Bulmer gained the first premium in a competition; it is a bold treatment of domestic Gothic.

This was developed and used again in the bank at Sheffield for the same company, and reached its climax in their Central Bank at Leeds. The building suffers from its cramped situation, the narrow streets rendering it impossible to obtain a good view of it. This will shortly be remedied, however, as the street is to be widened to 77ft. The bank occupies an area of 1,315 sq. yds., with the principal frontage to Infirmary Street extending 103ft., and the office frontage to Toronto Street 115ft. At the angle of the building is a tower terminated by an open stage covered by a pyramidal turret. Inside the turret is a stone staircase and a lift, giving access to the two suites of offices on the first and second floors. The basement of the building contains cellars, clerks' rooms and other apartments, as well as the heating, ventilating and lifting apparatus.

The business of the bank is conducted on the ground floor, where there is a large banking room, two entrances to which are obtained from Infirmary Street, with ranges of windows on the front and in the rear. All the internal walls of this room are arcaded and the apartment is fitted up and furnished in oak in the same style as the building. On the same floor there are rooms for manager, clerks, inspectors, and other officials, and a large safe-room constructed according to modern principles. A large and handsomely-decorated room for the use of the Board of Directors also occupies a part of the same floor. The second floor is utilised for storage rooms. The building is erected entirely of Bradford stone, with red-tiled roofs. Throughout the floors are constructed of iron and concrete, and the materials generally used in the erection of the bank are as far as possible fireproof. The building, excluding the land, cost £60,000.

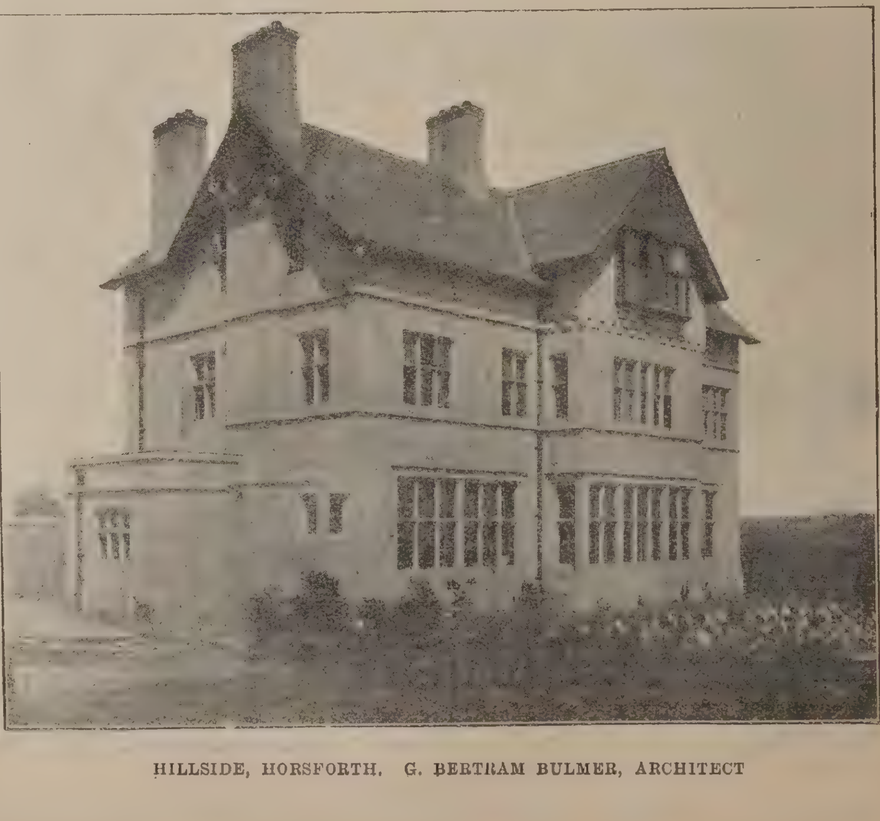
Mr. Bulmer has done a great amount of work in collaboration with his partner, Mr. Henry Perkin, in the county of Yorkshire. In the valley of the Wharfe especially one cannot enter a town or village without seeing some evidences of their work.

Between Menston and Burley is a well-designed lych gate in timber, with a roof-covering of red tiles, whilst in the village of Burley the Working Men's Club will at once proclaim its authorship by its vigorous treatment and characteristic detail.

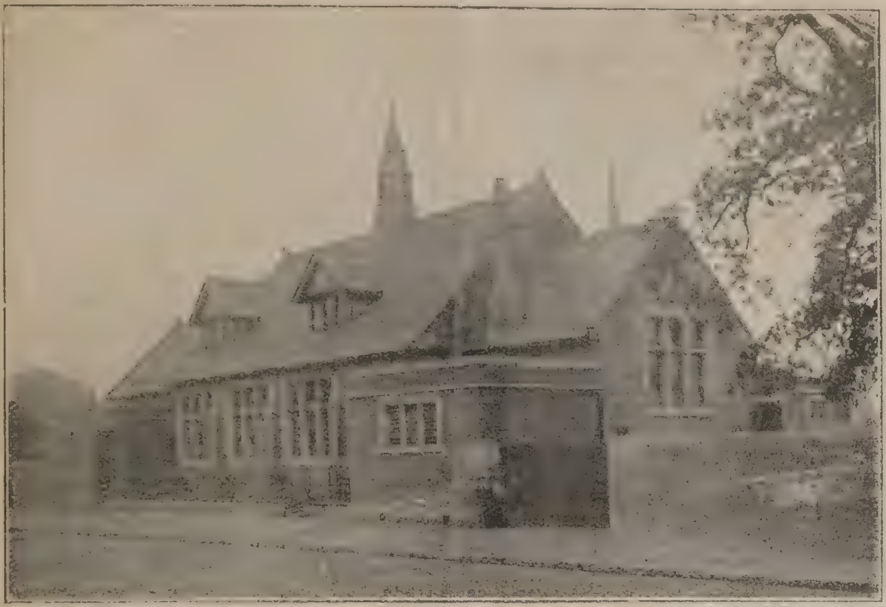
In the ancient town of Ilkley there are some buildings designed by Mr. Bulmer; a stone house for Mr. C. A. Rickards, now in course of erection, is the latest. This house occupies a very charming position on the Myddleton estate. It is on the north side of the river, and has a southern aspect. From the west windows there is a splendid view of the beautiful river Wharfe, winding away in the far distance. The building is designed to harmonise as much as possible with the surrounding country, which is of a wild nature, being mostly moorland. It is built of local stone and roofed with red tiles. The dining-room, halls, staircases and landings are finished in oak. The windows are glazed with leaded glass, and the hall, landing and principal rooms are heated by hot-water pipes in addition to open fires. The detail is truly Yorkshire in character, and the whole composition is evidently influenced by the simple yet dignified stone manor-houses of the county.

A large stone house at Horsforth for Mr. Stables was erected under the same influence, and with its bold detail and large expanses of wall surface makes a very fine composition. In Leeds the firm have erected the National Provincial Bank in Park Row, which was rather spoilt in its proportions by a right of light case. The lower storey is of polished grey granite, and is very simply treated; there are few mouldings and no ornament. The upper part is a free development of Renaissance in brick and stone.

The Buck Inn, at the corner of Kirkgate and Briggate, shops in Briggate, St. Chad's Schools, St. Cuthbert's Church, and a large warehouse in Wellington Street are a few of the other buildings in Leeds designed by Mr. Bulmer. Amongst other buildings by him are the town hall at Pontefract and the Courts at South Shields. Shipton Court, in Oxfordshire—a large Jacobean mansion—is now undergoing restoration under his supervision for F. W. Pepper, J.P.; the stone mullions to the windows are being reinstated



HILLSIDE, HORSFORTH. G. BERTRAM BULMER, ARCHITECT



ST. CHAD'S SCHOOLS, LEEDS. G. BERTRAM BULMER, ARCHITECT.

and the execrable sash windows taken out. The Ionic portico is being removed and replaced by a doorway more in character with the house. The principal rooms are to be panelled with oak wainscoting.

The accompanying illustrations serve to show the aims and methods which Mr. Bulmer observes in the execution of his work.

Views and Reviews.

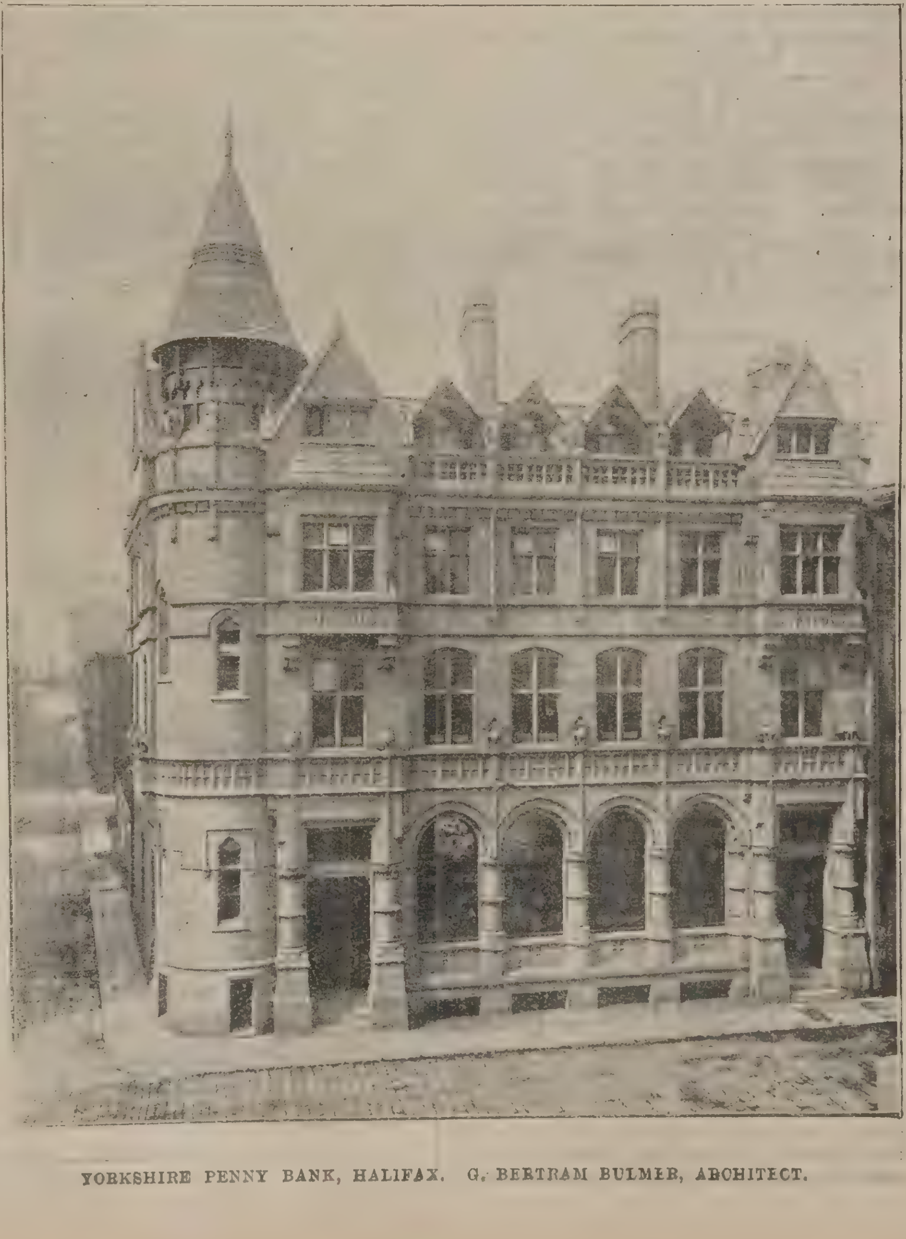
A New System of Perspective.

School perspective is objected to by practical men because, although correct, it requires a multiplicity of lines for its use and architects' perspective is substituted for it as soon as the requirements of business call for a pictorial representation of a building Whether the author has succeeded in still further simplifying the necessary procedure is a question which is *primâ facie* open to considerable doubt, since he requires no fewer than seventeen plates to explain his method. He alleges that by the rule he proposes there is no need for either the plan or elevation of the object to be drawn, and that the whole operation can be worked out within the space of the paper or canvas if to the right and left of the canvas two laths be fixed at the height of the horizontal line, to carry those points to which certain given lines tend. The rule referred to does not seem to be capable of brief statement in words, but apparently consists in a method of working. The principle of the method is stated in the following paragraphs:—"The right angle contained by two lines drawn through the foot of the spectator in the horizontal plane, and which meet upon the vertical brought down from his eye, although invisible to him, would appear as a right angle, that is, if the direction of his glance is perpendicular to its plane—*i.e.* if the point of sight is situated on the natural horizon Wherefore if, in order to see it, he steps back without altering the direction of his eye, the angle takes a form apparently greater than the right angle; and the further he recedes the more the angle opens, till its two arms gradually coincide with the line of the horizon, both because of the distance and of his position. From this may be deduced that the greater or lesser apparent opening of the right angle is relative to the distance at which it is seen, and to its position with regard to the horizon. This angle can therefore be taken at pleasure in its apparent form, more or less open, and thus its two sides may be more or less inclined towards the horizon. From this apparent or perspective angle we shall, after fixing the height of the horizon and the direction of the eye or point of sight, find the distance, the diagonal point, two geometrical points and two vanishing points."

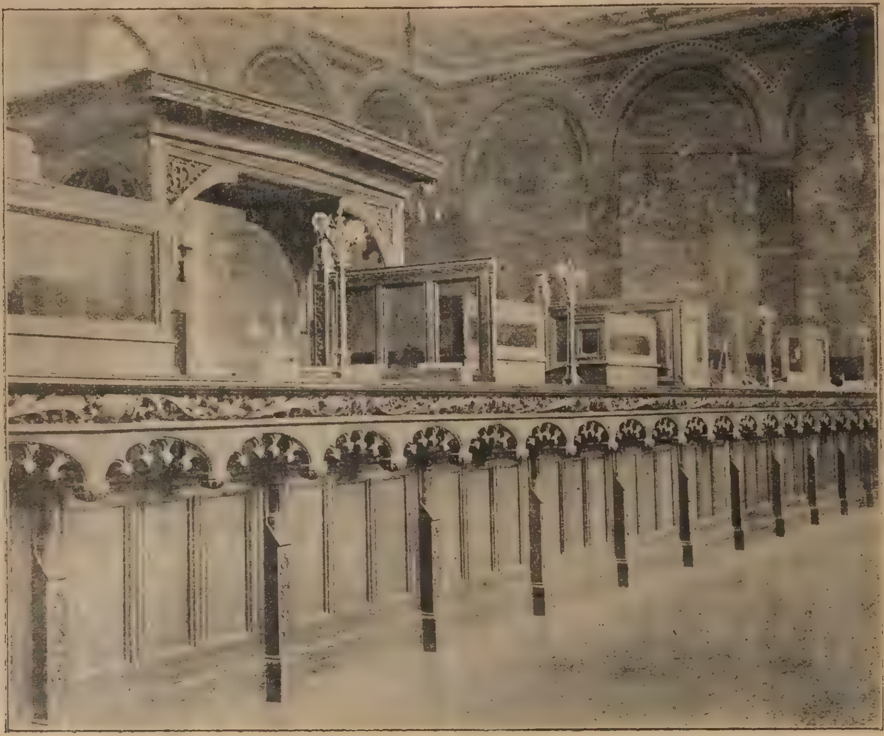
In connection with the first plate the author says, "Bisect the right angle G M H by the line M N, cutting G H at the point N. Take any point E on M N, and take any points A and B on the lines M G, M H equidistant from M." This reads like a description made up from a cursory inspection of the finished diagram, and does not tally with the evident mode of construction. It should be reversed, thus: "On the lines M G, M H take any points A and B equidistant from M, and from points A and B with a suitable radius describe arcs intersecting at E; from M draw a line through point E, cutting G H in point N; then M N will bisect the right angle G M H." This is not very hopeful in view of the long geometrical descriptions accompanying each plate. In describing the next one the centre of vision is called the point of sight, although it is more usual to apply this latter term to the position of the spectator. The author also calls what are usually known as the measuring points by the term "geometrical points," and the diagram of Plate 1 repeated on Plate 2 has now different lettering, which helps to confuse the mind in the endeavour to follow what the author has to put forward.

In Plate 4 the real idea becomes apparent: it is simply this, that instead of fixing the position and distance of the spectator with regard to the building we can draw in at pleasure two lines from the nearest angle of the perspective representing the base of the front and side of the building, and from this angle we can find the vanishing and measuring points which would make the assumed angle a correct perspective view; but *cui bono?* It surely is more satisfactory to an architect to choose the position and distance of the spectator than to commence his perspective by drawing the two base lines at an assumed angle.

After reading carefully through the book we are unable to discover any other advantage in



YORKSHIRE PENNY BANK, HALIFAX. G. BERTRAM BULMER, ARCHITECT.



INTERIOR OF BANKING ROOM, YORKSHIRE PENNY BANK, LEEDS.
G. BERTRAM BULMER, ARCHITECT.

the proposed method. As a school exercise it may have some slight use, but we do not think any architect would trouble to follow the instructions. In the final plate a happy suggestion is made that upon any photograph of a building the horizon line, vanishing points, &c., can be drawn by making use of some of the lines of the picture, and reversing the process of constructing a perspective view the geometrical dimensions of height and breadth can be obtained. This may occasionally be useful.

"A New System of Practical Perspective for Artists and Architects." By Cav. Settimo Giampietri. Published by the Royal Institute of British Architects at 9 Conduit Street, Hanover Square, W.

SOCIETY OF ENGINEERS.

THE PRESIDENT ON HEATING AND VENTILATION.

THE first ordinary meeting of the Society of Engineers for the present year was held on February 4th, when Mr. Henry O'Connor, the president for 1900, occupied the chair. Among the premiums for papers read during that year, the president's gold medal was awarded to Mr. Henry C. H. Shenton for his paper on "Recent Practice in Sewage Disposal."

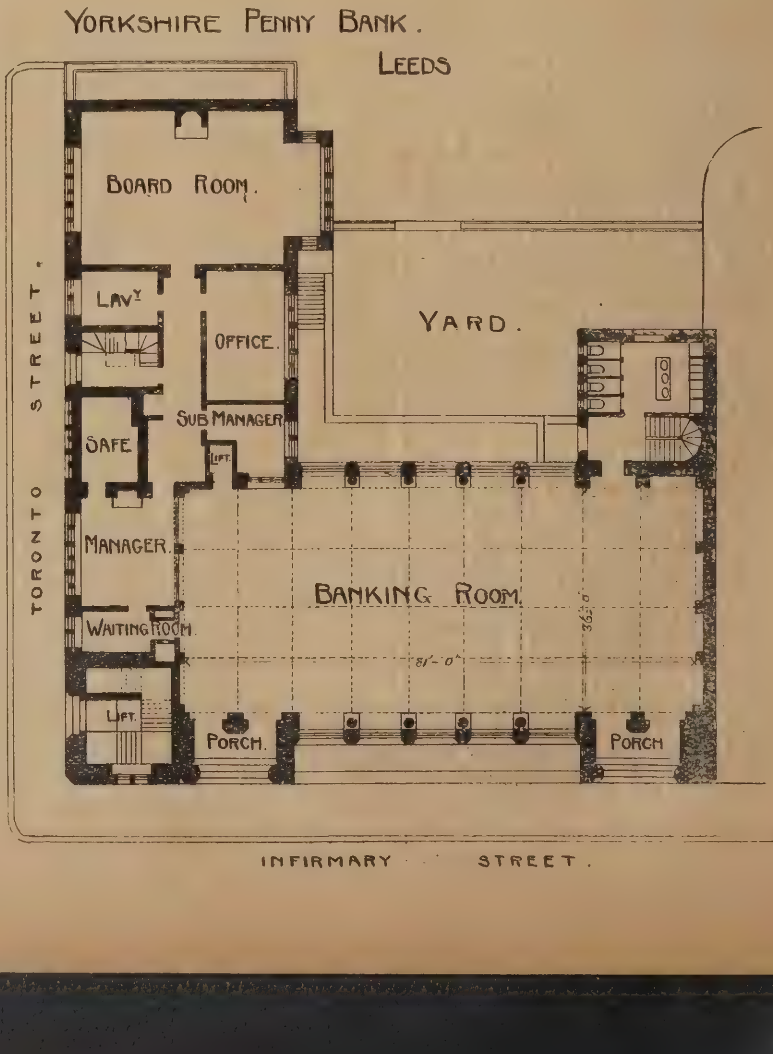
The president for the present year, Mr. Charles Mason, delivered an inaugural address. He first dwelt briefly on the marvellous progress made during the past century, but pointed out that engineers of the present day should not forget the skill and talent displayed generations ago in the construction of such monuments as the Pyramids, Stonehenge, and numerous Roman and other remains still in existence.

The practice of a municipal engineer was referred to, with special reference to work in large towns, including the repair and maintenance of sewers and pavements, and the construction of subways for accommodating the numerous pipes and wires laid beneath the street surfaces. Surprise was expressed that more headway had not been made with regard to the general adoption of a scheme of subways for London, the few now existing being frequently too small for the purposes they were intended to serve. An ideal subway was described by which the entire width of the street should be occupied, and the president observed that, although the cost and difficulties of construction would be great, if some scheme of rental, based upon the present expenses incurred in continually opening up and making good the street surfaces, were arrived at and devoted to payment of interest on capital, a good return would result.

The science of heating and ventilation was discussed with special reference to domestic heating and to the small extent to which well-known and efficient systems of heating had been adopted in private houses, old associations and cheap fuel being the prime causes for want of progress in the matter. The advantages and disadvantages of warming by steam, hot water and hot air were stated, the president pointing out that it was impossible to adopt the same principle for all buildings. Steam, he said, as a heating medium was not adapted for warming private houses, churches, or institutions where skilled labour was not permanently employed. In such buildings low-pressure hot-water formed a far better system, being more easily managed and not requiring such constant attention.

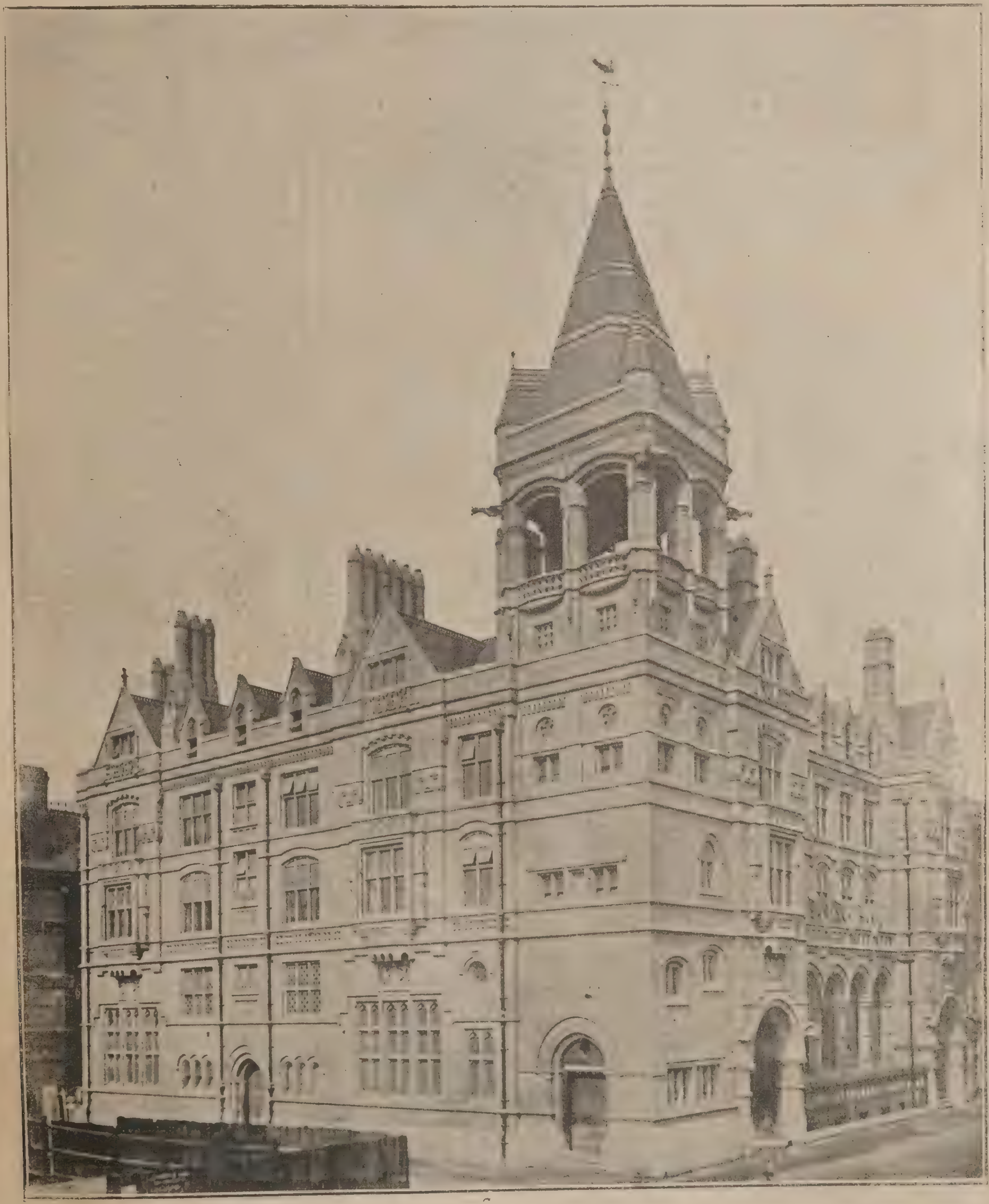
The inconvenience frequently experienced in designing an efficient apparatus from the want of reliable statistics, results of tests and formulæ for guidance, was pointed out. The difficulties of excluding air and water in a steam apparatus, the president observed, were great, and many attempts had been made to overcome them, but very often with only limited success. The formation of partial vacuum in the system combined with specially-constructed valves working automatically had, however, so far been successful in freeing the pipes and radiators from air and condensed water. In a low-pressure hot-water system any accumulation of air could be readily withdrawn by means of air valves, either automatic or otherwise, placed on the highest parts of the apparatus. The proportions between radiating surface, direct heating-surface of boilers, and grate area were then given, and the necessity of attending to the smallest details of construction was strongly emphasized if success was to be guaranteed, the circulation of hot water being very easily adversely affected. Heating by high-pressure hot-water and hot-air stoves was discouraged for domestic work.

The president concluded by briefly referring to ventilation as being closely allied to and dependent upon heating; the introduction of an ample supply of pure fresh air being the main consideration in arranging any system (whether natural or mechanical), without allowing such air to become overheated or to cause draughts on its admission into the apartment. Want of attention in the working of an apparatus after it had been installed was the chief cause of inefficient working. It was often the case that in a ventilating plant the air flues and inlets were seldom properly cleaned; and a thoroughly efficient heating apparatus might often be condemned through inattention to small details in management, such as regulating valves and cleaning flues, the engineer receiving the blame which should be bestowed on the caretaker.

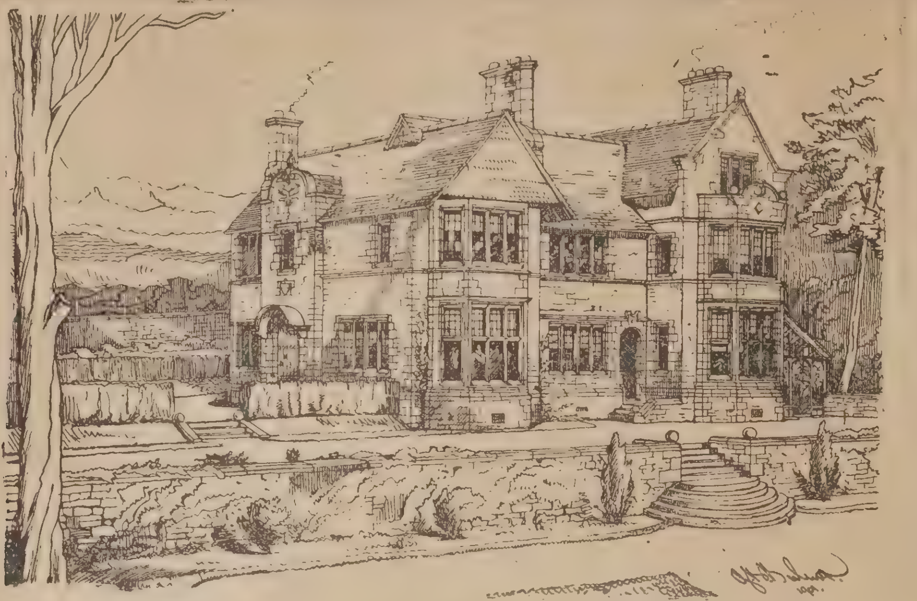


Law Cases.

Specific Performance of Building Contracts—The case of the *Mayor, &c., of Wolverhampton* v. *Emmons* came before the Court of Appeal on February 1st. This was an application by the defendant for judgment or a new trial in an action tried before Mr. Justice Wills and a special jury at Birmingham Assizes. The Court dismissed the application. The Master of the Rolls said that in this case the defendant, being minded to speculate in land and building, bought a piece of land in Wolverhampton from the Corporation. The indenture contained a covenant by the defendant that he would build on the piece of land a new building, or new buildings, within a certain period of time. The plaintiffs were desirous of having the land covered with buildings; but the defendant did not perform his obligation. He, however, obtained from them further time on making promises to carry out his contract. A correspondence took place, and by a letter of July 5th, 1899, the defendant undertook that, if further time were allowed him, he would build eight houses within two months. That letter, coupled with certain plans to which it referred, seemed to constitute a definite and unambiguous agreement. But still the defendant did not carry out his undertaking, and in March last the plaintiffs issued the writ in this action claiming specific performance and, in the alternative, damages. He thought that this was a case for specific performance. In his opinion, when there was a specific unambiguous agreement to erect a building and it was important to the person with whom the agreement was made, over and above mere money damages, that the agreement should be carried out, that was a case in which the Court of Chancery would have granted specific performance. If the party had contracted to build according to specific terms, it was not fair that he should be allowed to break his contract and then say that the other party should only get damages out of him. In his opinion, in the present case the loss arising to the plaintiffs from this land remaining vacant could not be estimated in damages, and he thought that the judgment of Mr. Justice Wills was right. Mr. Justice Wills made a decree for specific performance, saying that he gave the plaintiffs leave to make any amendment that might be necessary. Lord Justice Collins said he was of the same opinion as the Master of the Rolls. The houses which the defendant had contracted to build were specifically defined, and he thought it was made out that no adequate compensation in money could be made to the plaintiffs for non-performance. Lord Justice Romer said he had felt some doubts, but he agreed in thinking



YORKSHIRE PENNY BANK, LEEDS. G. BERTRAM BULMER, ARCHITECT.



HOUSE AT ILKLEY FOR MR. C. A. RICKARDS. G. BERTRAM BULMER, AHCHITECT.

that the judgment of Mr. Justice Wills ought not to be disturbed. He took it to be a general rule that the Court would not grant specific performance of a building contract. But there were certain recognised exceptions to that rule. For many years it had been held that plaintiffs seeking specific performance of a building contract brought themselves within the exceptions if they established, first that the building work was defined—that was to say, that the nature of it was so definitely ascertained that the Court might know what the work was; secondly, that they had a substantial interest in having the contract specifically performed, and that that was an interest which could not be adequately compensated by damages; and, thirdly, that the defendant had by reason of the contract obtained possession of the land on which the building was to be erected. His lordship then went through the facts of this case and showed that the three requisites above mentioned were satisfied, and came to the conclusion that the appeal must be dismissed.

Insurance of Workmen: Liability of Sub-Contractors.—At the Manchester Winter Assizes on February 5th the case of *Neill and Sons* v. *Hamor Lockwood* was heard. This was an action to recover damages for breach of contract. From the statements of counsel it appeared that in May, 1899, Messrs. Neill and Sons, builders, of Manchester, entered into a contract with the Lancashire and Yorkshire Railway Company for the construction of certain works, and they re-let a portion of asphalt work as a sub-contract to the defendant. The specifications and conditions attached to the sub-contract contained a clause to the effect that the defendant should include in his tender insurance of the workmen in his employ, it being a condition that the plaintiffs were not responsible for any accident occurring to the defendant's workmen. In the course of carrying out the work a man employed by the defendant was injured, and died. His widow made a claim under the Workmen's Compensation Act to which both the plaintiffs and the defendant were parties, and the case came before Judge Parry as arbitrator. The Court of Appeal had previously declared the law as to sub-contracts to be that a sub-contractor was not an "undertaker" within the Act, and was not liable to have a claim under the Act made against him; and Judge Parry, following this decision, awarded the widow £234 damages against Messrs. Neill and dismissed the application against the defendant Lockwood. The plaintiffs now sought to recover from the defendant this sum, together with £31, the amount of the costs in the arbitration. It was argued, on behalf of the plaintiffs, that the defendant was bound by the terms of his sub-contract to indemnify them against any claim for damages for injuries suffered by the defendant's workmen. On the other side it was urged that by taking out an insurance policy the defendant had performed any duty which was imposed upon him by the clause in question, and that there was no contract entered into to indemnify the plaintiffs against damages under an action that might be brought against them. The Judge said he was of opinion that the clause had been inserted for the protection of the plaintiffs with the object of throwing upon the defendant the obligation to discharge any claims which might be made by the defendant's workmen against the plaintiffs. He thought that the plaintiffs used sufficiently accurate words to express their intention. The defendant was to include in his tender provision for insuring his workmen—that was to say, he was to provide for the cost of effecting policies under which the claims of workmen in his employ might be met. He gave judgment for the plaintiffs for the amount claimed, with costs.

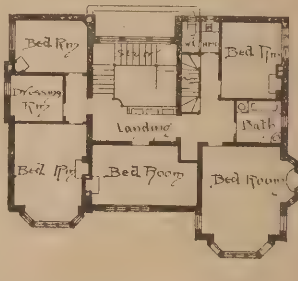
Quarry Notes.

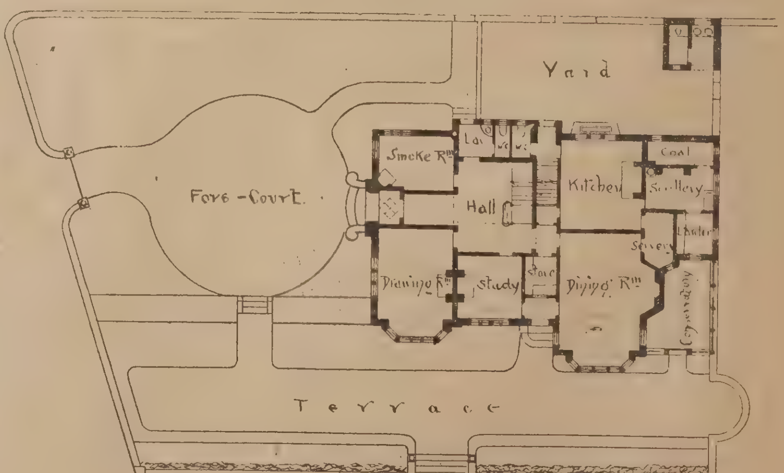
The Export of Slates at Carnarvon and Portmadoc has increased very slightly lately. The quarries at Festiniog, Nantlle, and Llanberis are full of workmen, and at the Port Dinorwic dock a brisk trade is being carried on. The employers feel satisfied that they have succeeded in their attempt to keep away foreign slates, and expect that at the beginning of March a change for the better will take place. This would mean that the prices will go up, and with them the men's wages. But the effect upon the slate trade generally would also be to result in foreign competition and the opening out of markets hitherto in the hands of Britain to America, France, Belgium, and Newfoundland.

Messrs. Burgess, Burgess and Company, of Abbey Mansions, 25 Victoria Street, Westminster, S.W., whose speciality is as agents for polished granite, dressed masonry, setts, macadam, granite adamant flags, steps, sills, &c., are acting as the London office of the Shap Granite and Patent Concrete Company, Limited, the Ceiriog Granite Company, Limited, and the North Wales Paving Company, Limited.

Swedish Stone Exporters have submitted an address to the Government as to the possibility of Germany charging kerbstone with so high a duty as to practically bring about a stoppage of the import. The Government is earnestly requested to make any efforts to avert the eventual dangerous result of such a measure on the part of the German authorities. A general stonecutter strike was declared on January 2nd at all quarries in the county of Blekinge, Southern Sweden.

The Aberdeen Masons' and Granite-Cutters' Union held a special joint meeting of the members of the local building and monumental branches of the trade last week in the Trades Hall, Belmont Street, Aberdeen. Mr. John Anderson, president, occupied the chair. The first question under discussion was a proposal by the Aberdeen monumental branch that the union should establish a trade paper. This was moved by Mr. Alex. Craig and seconded by Mr. George Younie. After considerable discussion, a vote was taken, with the result that 421 were in favour of the proposal and 15 against it. The next question was the payment of £50 to a member for total loss of sight of an eye, under the accident provident rules of the union. This rule provides that any member being disabled from following his employment by losing the sight of his eyes shall receive £50. The opinion of a section of the members was that the loss of the sight of one eye did not disable a man from following his trade. It was, however, thought by the meeting that such an accident was serious, and it was decided to remit the matter back to the Central Committee to consider what should be done to make provision for such cases.





HOUSE AT ILKLEY FOR MR. C. A. RICKARDS. G. BERTRAM BULMER, ARCHITECT.

Correspondence.

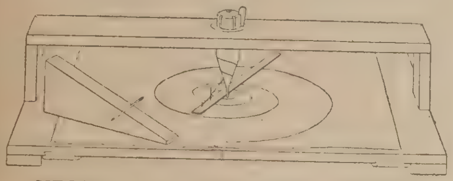
The Grecian Ionic Volute

To the Editor of THE BUILDERS' JOURNAL.

LONDON, S.E.

SIR,—Referring to the query about setting out the Grecian Ionian volute on page 477 of your issue for January 23rd, my answer to "P. H. E." would be as follows:—

Take a common whelk shell and clean it thoroughly, especially in the line of the spiral; then twist a string around it, tie a loop at the end, put a pencil through the loop, hold the shell firmly point downwards over a sheet of drawing paper, keep the pencil on the paper, and unwind the string; thus you will have a Greek volute.


METHOD OF DRAWING IONIC VOLUTE.

The above sketch shows how the spiral may be drawn with perfect accuracy by means of a straight-sided cone, but the shell is likely to give a more graceful curve.

As to Gwilt's (or Goldman's) method, anyone who appreciates Greek curves would never tolerate the broken-backed line so obtained.

In the old Greek spirals the deep centre hole held the cone not only to set out the curve for the mason but also to engrave the outline on the marble when he had finished; and this engraved line can be seen on the examples in the British Museum. The centre hole was afterwards made more shallow, then the cone was turned point down, and a very small hole was made to receive it, as in the Niké Apteros capital at Athens; finally the hole disappears altogether.

As to the proportions of the order (?), it is useful to have a general knowledge of the sizes of the different parts, but exact proportions are out of the question in view of the fact that the relation of the parts is different at different heights and in different surroundings; thus, the corner columns seen against the sky should be thicker than those seen against the darker building.

Do not forget the meaning of this wonderful composition: give the ovolo on the top of the column a good projection so that it may bear up the cushion which takes the weight of the entablature; and be sure to tuck the corners of your cushion (the volute) well under the projecting member. Above all, put brains into your work and make it live, then you will find the subtle principles of Greek (or Egyptian) design worthy of the hardest study, and yielding the most interesting results.—Yours truly,

DANIEL WOOD.
Author of "A Handbook of the Greek Method."

Cockington Church, Devon.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I desire to thank Mr. Harry Hems for his information respecting the font in this church, my description of which was certainly "a little misleading," although, as may be seen on referring to it, there was no statement to the effect that the whole of the font cover was original Perpendicular work. I did notice that the carving on the curved top was much cleaner cut, and that it seemed to be stained of a darker colour than that of the vertical portion; but, as I had no absolute proof of the fact of its having been recently made, and also because of its unity with and close resemblance in character to the rest of the cover, I refrained from expressing any views as to the probable date of its execution. But it is perhaps opportune to mention that the font is in almost the darkest part of the church. However, without any intention of flattering Mr. Hems, I may say that I am not at all sorry that I drew the font in its entirety as it stands to-day, not only because I understand that the greater part of it is original, but for the simple reason that I admire it, and that I appreciate good modern work (such as that in question) as well as those ancient forms and examples which furnish us with the material and basis for such work. Yours truly,

JOSIAS C. BEARE.

Lightning Conductors.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I am agreeably surprised to find that Mr. Savery considers my previous letter too short. I confined myself to criticism of what I considered to be dangerous misconceptions, and purposely avoided any attempt to put the opposite side of the question, because it would be impossible in a space necessarily limited to do more than give a few general principles, and even then the explanations necessary to make them understood would have had to be omitted, so that probably the result would have been further misconception. An illustration of this is the report of the Lightning Rod Conference which was initiated by the Royal Meteorological Society and consisted of members of the leading learned societies, including the R.I.B.A. As the result of careful investigations, a report and set of rules were issued for the guidance of those interested in protection from lightning. These rules are in the main excellent, and did much to improve the bad practice which had previously existed even among those professionally engaged in the business, but I do not think they were ever intended to serve as a complete guide covering the subject from Alpha to Omega, or that anyone would consider that by reading those rules he could become an expert qualified to design a proper system of protection. It would be possible for conductors to be apparently in accordance with these rules and yet not be efficient, and it would require an expert to point out wherein the discrepancy lay. I did not intend to imply that Mr. Savery supposed that lightning was literally a fluid contained in a cloud, and I presumed that he used the word fluid in the same way as some of the older electricians did, as being a convenient term used only for want of a better; but I think the general tenor of the article implies that he had an idea that the only problem was to afford a sufficiently easy path for something stored up in a cloud. Most people regard the matter in this light.

For efficiency it is not the form or make of conductor which is necessary, but the personal knowledge which enables a man to take into due consideration a multiplicity of details (sometimes of the greatest importance, though easily overlooked) as to themselves, their relation to one another and to the proposed conductor, and so to arrange the system of defence that the building is left secure. A man who had the requisite knowledge could protect a building absolutely, using nothing but a coil of iron wire, some nails, a hammer and a spade, while one whose knowledge was confined to a set of rules would probably make a dismal failure when using the highest conductivity copper tape, elevation rods of the most approved type, and all the etceteras which are justly regarded as proper. As to how long the iron wire arrangement would remain efficient is another story. Even electricians do not generally plan their own system of protection. Appreciating the difficulties of the subject they prefer to rely on someone who has made it a special study. Even the late Professor Tyndall, whose name was closely connected with the subject, was no exception to this rule, but consulted a specialist for his own house and recommended one to his friends when they consulted him. I can hardly understand Mr. Savery's last remark. He surely does not regard lightning as wandering aimlessly about until it meets with a building to wreck or a conductor to go quietly down by. The discharge is, of course, between two oppositely charged planes—the earth and the cloud, and the path is all arranged beforehand by induction. What I meant to imply was (for instance), that, given a church tower with four pinnacles and a conductor on one only, lightning would not necessarily be attracted to the conductor, but would be liable to take one of the other pinnacles en route.—Yours truly, ALFRED HANDS.

Engineering Notes.

New York Elevated Railway.—The conversion of the New York Elevated Railway from steam to electric power will, it is expected, be completed by June next.

The new Electricity Station for East Ham is being ventilated by means of Shorland's patent exhaust roof ventilators, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The Carnegie Sale.—A sale has been agreed upon in America by which the Carnegie Steel Company, the Federal Steel Company and other leading firms will be combined. The sale will be effected at £80,000,000.

Electric Light for Fulham.—To-day the Mayoress of Fulham (Mrs. E. A. Cornwall) will publicly switch on the electric light in this metropolitan borough. The generating station is combined with a refuse-destructor and a disinfector, and will entail an expenditure of £130,000.

Leicester Tramways.—The Leicester Town Council unanimously decided last week to purchase the undertaking of the Tramways Company and to work it under their statutory municipal powers, the present horse-power to be replaced by electric traction. Roughly estimated, the cost of the scheme is over half a million.

The Barrage of the Nile.—Sir John Aird and Sir Benjamin Baker are now returning to England, having completed their visit of inspection to the great engineering works at Assuan, where the immense dam to hold up the waters of the Nile is being constructed. The total extent of the dam is one mile and a quarter, of which one mile and an eighth of the foundation is finished. Unless anything unforeseen occurs, the reservoirs will be in operation for the Nile flood of 1903.

London Water Supply: Storage Cisterns.—A conference of the London County Council, the Corporation of London and the new Municipal Boroughs of the metropolis was held last week to consider the proposed new regulations of the water companies as to the supply of water to householders and others. Great objection was taken to the following regulation: "Every house (or in case of flats each suite of rooms) supplied by the company shall, except with the consent of the company in writing under the hand of their secretary, be provided with a cold-water storage cistern or cisterns of sufficient capacity to contain in the aggregate at least 25gal. of water for each room. Each outlet pipe from such cistern or cisterns shall be carried up inside 1in. above the bottom of the cistern, and such outlet pipe shall be commanded by an efficient screw-down stop valve, placed in a readily accessible position, within 1ft. of such cistern, and a draw-off tap from same shall be provided. In no case may there be any connection between the draw-off pipe from the cistern and the supply or communication pipe." Mr. Westacott pointed out that immediately the companies got the powers they asked for by this regulation they would only give an intermittent instead of a constant supply. Mr. Wood objected to cisterns, and the conference agreed to oppose the regulation with a view to its being struck out. The Council's report pointed out that it was the danger to health caused by the use of dirty cisterns, particularly in the houses of the poorer classes, that gave rise to the legislation of 1871, under which the whole of London (except a few places beyond the statutory limits) was now nominally provided with a constant supply. Other proposed regulations dealing with every form of water-supply were considered and generally opposed as being against the consumer and against the interests of the health of London.

Glasgow Royal Infirmary Competition.—The Executive Committee for the Reconstruction of the Glasgow Royal Infirmary have appointed a sub-committee "to formulate on behalf of the Executive a statement of the case from their point of view in order that the public may be accurately informed of the actual position of affairs."

Bricks and Mortar.

APHORISM FOR THE WEEK.

It is not possible for a man who follows many arts to do everything well.—XENOPHON.

Our Plates. THE measured drawings of St. John's Church, Westminster, gained for Mr. A. Wyatt Papworth a medal of merit and five guineas in the Royal Institute competition this year. This much-abused church stands in the centre of Smith's Square. It was begun in 1716 by Thomas Archer, a pupil of Vanbrugh's, and was one of the fifty churches proposed to be erected by Queen Anne. The cost was about £40,000, and the building operations occupied twelve years. Great objection has been taken to the four angle belfreys, but these formed no part of the original design—they were added in the hope of securing equal pressure upon the foundations, which, before the building was completed, had shown signs of settlement, owing to the swampy nature of the soil. The result was considered satisfactory. In 1741 the church was greatly damaged by fire, only the walls and towers remaining standing. Up to this time in front of each Corinthian pilaster internally stood a Corinthian column to match, supporting the ceiling and the entablature. But these were removed after the fire and the pilasters only remain. The roof, as may be seen from an old oil-painting in the vestry, was not originally of the present design, being a semi-circular barrel vault (plaster) running north and south, and lighted by the semi-circular opening (then glazed) in the pediments, which now stand up so meaninglessly above the roof at the backs of the porches. Another semi-circular roof ran east and west and the groined intersection of the two probably created a far handsomer effect than the present flat ceiling. The windows of the east end were glazed and not filled up as at present; the filling was not done until 1821, when the painted glass window, which came from an old church at Rouen, was inserted. In 1758 the galleries were added and in 1821 increased in size by William Inwood. The crypt of this church is constructed of massive brick barrel-vaulting, the walls in some cases being 6ft. thick. The intersections of the vaults are carefully worked in cut brick.

The Advice of Presidents. IN reviewing "Architectural Association Notes" for February in our issue for last week we stated that it contained "New Century Greetings" from the past presidents, and that we hoped to give some extracts in the present issue. This we are now able to do. The greeting from Mr. Thomas Blashill, the late superintending architect to the London County Council, is eminently characteristic of him. Mr. Blashill says:—"Your work is to design, estimate and superintend buildings. Stick well to that. Eschew gardening, pastoral staves, and hammering of pots, but know about flowers. Be easy with archæology. Study old work sufficiently, modern work incessantly. Study also workmen and tools. Form an opinion of every building new to you, and every published illustration. Account for such as please you, ponder wonderingly over the rest. Listen with discrimination. Pray against twaddlers, and stop your ears. (Have I not suffered fifty years under their droning!) . . . Be always trying your hand at design, of which plan is the root, elevation the flower. . . . You will do better than you expect; might found a School. How the critic would enjoy the scent of your heels!" Mr. T. Roger Smith gives students this advice: "Attach the first importance to the study of actual buildings on the spot." The same advice is given by Mr. Thomas Henry Watson, who says: "Good craftsmanship must in future depend upon the architect. For excellence of contrivance, materials and workmanship, let the student look to the best modern work while it is in progress, to all good work of former days when it is under repair." In Mr. John S. Quilter's opinion: "The basis of all true architecture is a thorough knowledge of construction. Study to make a building indicate the purpose for which it is intended, and do not sacrifice utility to appearance. Always secure the most convenient arrangement of all parts of a building before attempting to give it any architectural effect. Never destroy the sound construction of a building for the purpose of using some detail or ornament." Mr. Cole A. Adams says: "While you have the time, health, and the enthusiasm of youth, follow Burges's dictum, 'Measure and sketch, sketch and measure.'" Mr. Leonard Stokes says: "Let us therefore this new century resolve to be much more thorough in our work, and thus force our way into our proper place, *i.e.*, the top." "As to a word of advice to my fellow students," says Mr. Frank T. Baggallay, "I can only suggest that the practice of making clay models of buildings from sketch designs might lead us far towards a better appreciation of the true value of relief and mass." "Enthusiasm"—this, in Mr. Edward W. Mountford's opinion, "is the most important thing for the student to possess." Mr. W. D. Caröe says: "Study to regulate the prevalent go-as-you-please style of architecture."

Horniman's Museum. THE Museum at Forest Hill which Mr. Horniman has presented to the people of London (see page 34 of this issue), was designed by Mr. C. Harrison Townsend. Taking advan- of the declivity of the ground, the architect divided the building into two galleries of practically equal size, and the corridor arrangements permit a continuous circulation of visitors. The museum is buit of Doulting stone, similar to that employed in Wells Cathedral, and the design is striking and unusual. It occupies a superficial area of 16,485 sq. ft. The most prominent detail is, doubtless, the exterior decorative mosaic panel, 32ft. by 10ft., which occupies the whole length of the main façade, the figure being larger than life size. This is the work of Mr. R. Anning Bell and Mr. George Bridge, and it is an allegory of the course of human life in the spiritual and intellectual sense. It is interesting to note that the 117,000 small glass tesseræ contained in the design were put together almost exclusively by young women.

The Roman Wall. AT the meeting of the British Archæological Association held on January 30th (Dr. W. de Gray Birch, F.S.A., in the chair) Mr. R. W. Forster gave a very interesting lecture on the Roman Wall. After a short description of the situation and design of Hadrian's Wall and a brief statement of the questions concerning the wall and the earthen vallum, views were shown of the chief portions which still remain. The series began with the most easterly fragment of the wall, near Heddon, and this was followed by three views near Downhill in the neighbourhood of Corbridge, where the vallum makes a sudden bend and skirts the south side of the hill, while the wall keeps to the northern brow. At this point an ancient road has recently been discovered, cutting through the vallum, and it has been suggested that the road is Roman, and the vallum therefore of earlier date than the wall. Downhill, however, was extensively worked for limestone at an early date, and it is hardly possible to assign a definite date to many old roads and tracks which lead to it. Even if the road in question be Roman, the lecturer considered that fact did not prove what is alleged, for the Roman occupation lasted for nearly three centuries, and probably the vallum was not kept in repair after the province south of the barrier had settled down. Several views were shown of the remains at Cilurnum (the Chesters), including the flagstone pavement recently exposed in the forum, from which inscriptions may be possibly recovered if the lower sides of the stones are examined; also the larger eastern gateway, with the wall coming up to its southern side, showing that this gate as well as the north and main west gates opened on the northern side of the defences, possibly to enable cavalry to issue with greater speed from the fortress. Cilurnum was garrisoned by the second ala of Asturians. Views were shown of the large suburban building between Cilurnum and the North Tyne, which has been described as a bath or a temple, but was probably a villa. The largest chamber has a row of seven niches, which perhaps originally held statues representing the seven planets and the seven days of the week; in size and in appearance they resemble the niches of the reliefs discovered at Plumpton in 1813, which represent five of those deities (see Lapidarium Septentrionale, p. 411, No. 805). Another view showed the alcove opening out of the long chamber, with the lower part of its window, below which many fragments of glass were found. At the back of the villa is a space bounded by three walls and open behind, and it seems to have been roofed over; in one corner is a hatch or small window opening on the floor-level of one of the rooms within, and below this hatch the hypocaust is brought outside the building, forming a kind of table. It was suggested that this space was the kitchen of the villa, and that the hypocaust formed a kind of "hot plate" on which the dishes were placed before being passed through the hatch to the triclinium.

Borcovicum. A SERIES of views of Borcovicum were next shown, beginning with the gate in the valley on the east of the fort, formerly supposed to be a means of access to the so-called amphitheatre on the north of the wall. This however has recently been proved to be merely an old quarry, and the purpose of the gate was evidently strategic. Views of the east, west and north gates of the fortress were exhibited, as well as of the recently-excavated prætorium and the fine water tank in the south-east corner. Views of the Housesteads Mile-Castle, showing how the massive north gate was partially walled up during the latter part of the Roman occupation, and several views of the remains of the wall on the basalt hills beside the Northumbrian lakes, were shown. Attention was directed to the manner in which at the gaps in the line of hills the wall is drawn back so as to command both flanks of an attacking party, and also to the sudden changes of thickness which occur at many points. Dr. Bruce's theory that these show the places where the working parties joined up their sections seems insufficient. As a rule the insets go in pairs, forming a shallow recess in the south side of the wall, generally less than 1ft. deep and from 20ft. to 200ft. long, and in many cases the lowest course is not set back at all. Just east of the Housesteads Mile-Castle, the breadth of the wall changes seven times in 180ft. The series of views ended with that of the last fortress of which the name can be identified. In view of the forthcoming Congress at Newcastle-on-Tyne the lecture was much appreciated.

Workmen's Compensation: Mr. Ritchie's Letter. SOME time ago Mr. Edward Lovekin, of Kelsall, Chester, wrote to Mr. Ritchie, at the request of Mr. Chamberlain, asking whether it was the intention of the Government to remedy the difficulties attending the operation of the Workmen's Compensation Act in the ensuing session, and stating that it was considered scandalous that such an amount of litigation should attend the working of the Act. Mr. Ritchie replies "that it can hardly be considered immaterial that out of a measure making a new departure on a subject of great magnitude and complexity points of difficulty should have arisen, which have led to litigation. But many of the most important questions have now been settled by the decision of the authoritative courts, some of which show that several of the hostile criticisms passed at first on the effect of the Act were not well founded. Reference may be made in particular to two or three recent judgments of the House of Lords. Also it should not be forgotten that while the cases of litigation attract notice, the number of workmen who obtain the benefits of the Act without dispute is almost immeasurably greater." Mr. Ritchie is taking note of the points in which it may prove that the Act requires amendment, and all the questions which have arisen on it are receiving the very careful consideration of the Government, "but it is not possible to make any promise as to legislation next session."

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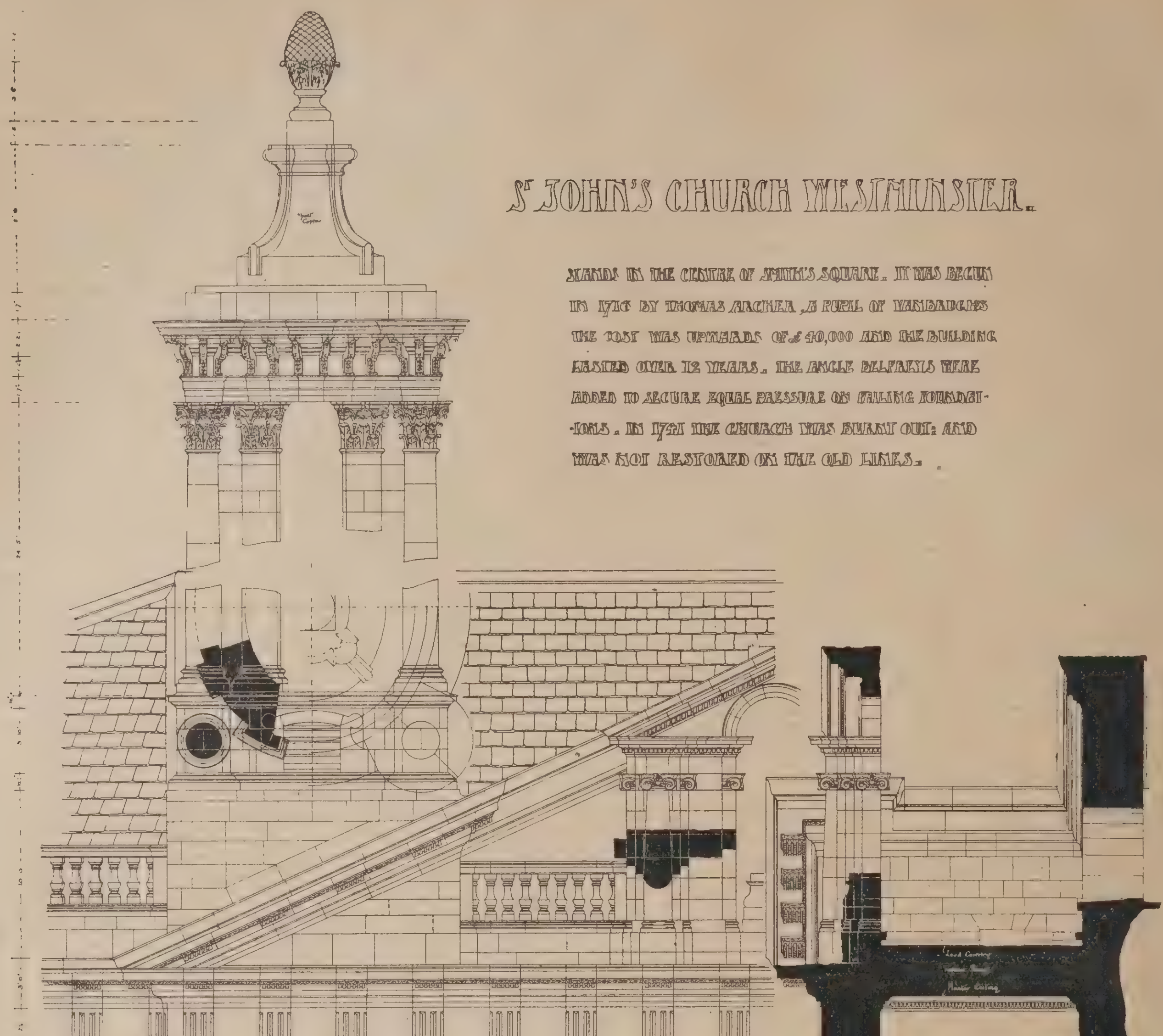
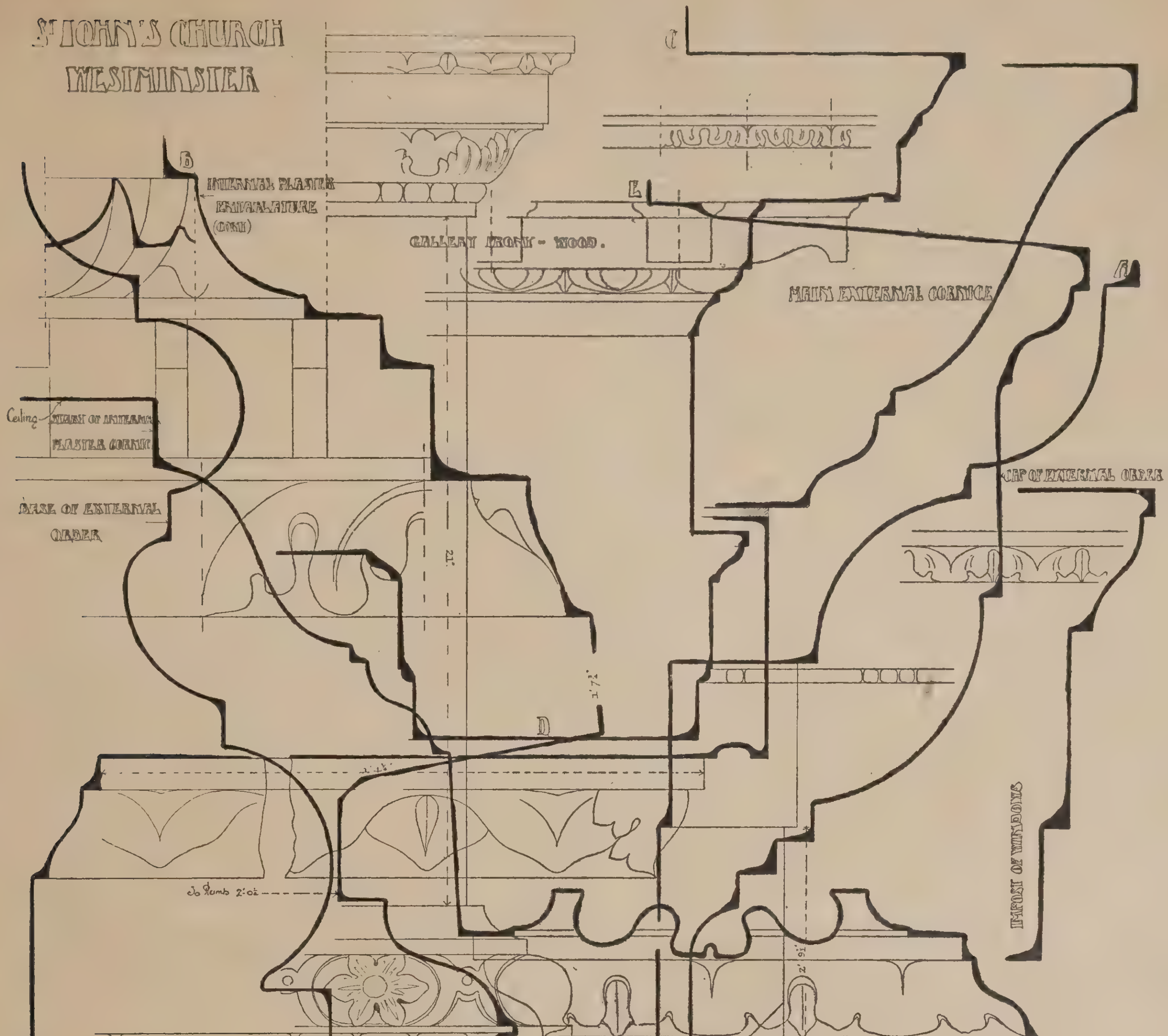
Wednesday, February 13th, 1901.

ST JOHN'S CHURCH WESTMINSTER.

STANDS IN THE CENTRE OF SMITH'S SQUARE. IT WAS BEGUN IN 1716 BY THOMAS ARCHER, A PUPIL OF VANBRUGHS THE COST WAS UPWARDS OF £40,000 AND THE BUILDING LASTED OVER 12 YEARS. THE ANGLE BELFRYS WERE ADDED TO SECURE EQUAL PRESSURE ON FAILING FOUNDATIONS. IN 1741 THE CHURCH WAS BURNT OUT: AND WAS NOT RESTORED ON THE OLD LINES.



R.I.B.A. COMPETITION FOR MEASURED DRAWIN



. Wyatt Papworth (Medal of Merit and £5 5*s*.).

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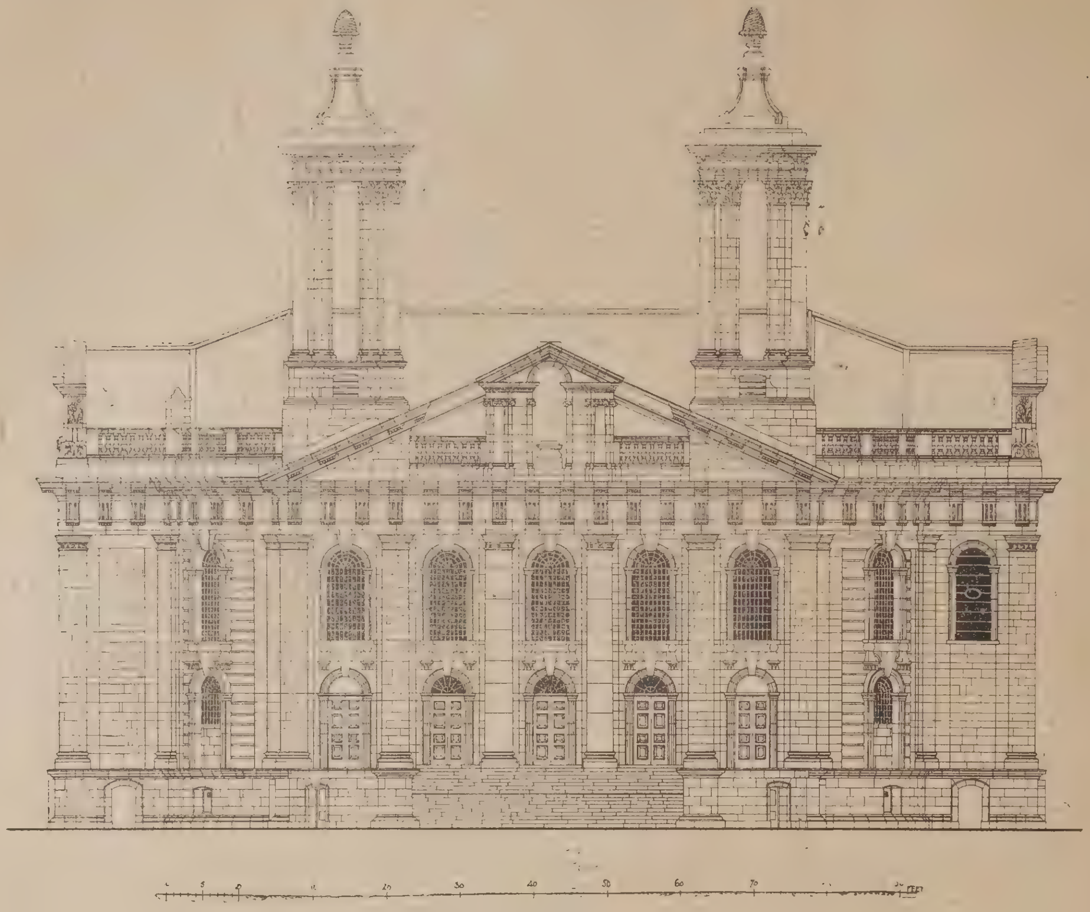
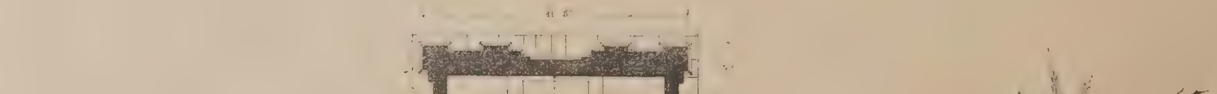
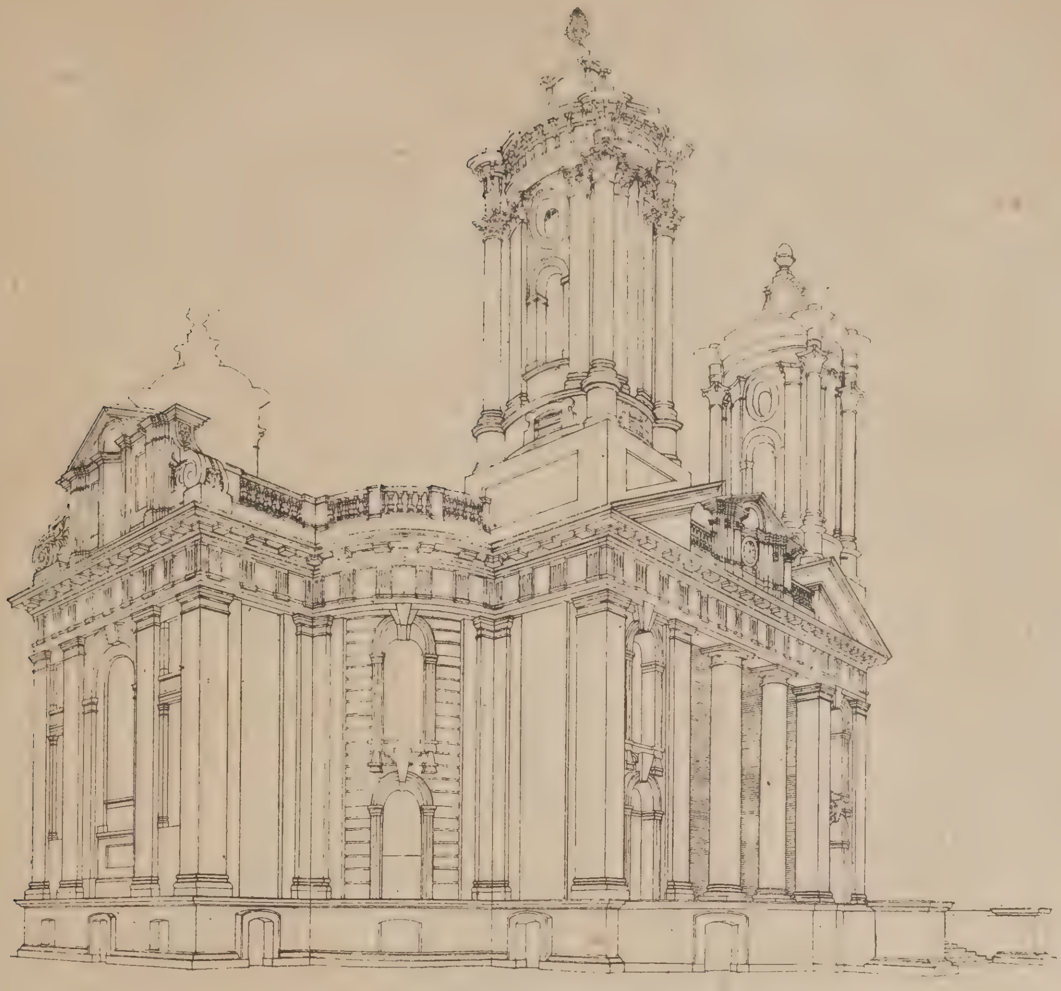


South Front Elevation.

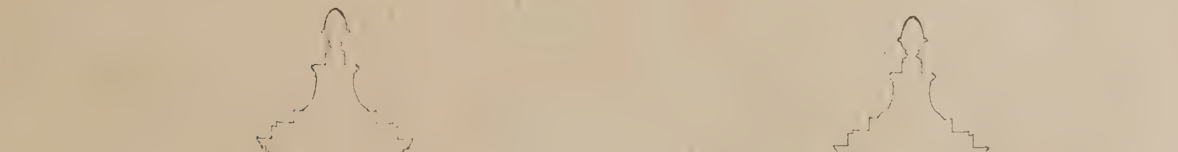


Seating Plan.

R.I.B.A. COMPETITION FOR MEASURED DRAWINGS: ST. JOHN'S CHU



Perspective View.



Transverse Section.

WESTMINSTER. By A. Wyatt Papworth (Medal of Merit and £5 5s.).

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THE PLANNING OF INEBRIATE REFORMATORIES.—II.

By GEORGE H. BIBBY.

(*Continued from page* 474, No. CCCXI.)

THE accompanying illustration shows the ground plan of an inebriate reformatory o which I referred in my previous article: it has been put forward by the Home Office, not as a model, but simply as a suggestion to be modified to meet the requirements of various districts. As I have already pointed out, it is most faulty in its details; yet the general arrangement of the blocks of buildings round a central courtyard shows a scheme that could be advantageously and easily applied, and the safe custody of the inmates thereby be adequately provided for without the necessity for very extensive and costly fences. The workshop accommodation, as shown, is not intended to provide for the requirements of the whole reformatory, but it has been suggested that some regular industry should be associated with each institution, and that a considerable number of the more tractable inmates be taken during working hours, under suitable supervision, to sheds or other suitable erections elsewhere specially erected and fitted and constructed purposely for the selected trade or occupation; but workshops as shown in connection with the main building, would be of great value in providing space for special occupation, according to the training and capacity of the patients, each inmate being, whenever possible, encouraged to follow his own calling; a course probably tending to the financial advantage of all concerned. As mentioned in my first article, a certain proportion of the inmates would probably be confined to the central courtyard or exercise ground and the main building, and for these workrooms would certainly be required.

I have already directed attention to the rather numerous defects of this plan, but, on the other hand, it is carefully designed to ndicate a minimum of outlets, and these could very easily be protected. The actual buildings for living accommodation form the greater portion of the boundary, thus avoiding the expense of additional walling, and at the same time presenting an unobjectionable and most effectual barrier against escape of the patients.

It has been admitted that some of the rooms might, with advantage, be somewhat increased n size: it would appear that too much attention has been directed to the question of the reduction of cost, and I am of opinion that there has been in this plan a reduction of the accommodation to a minimum which would mpair the efficiency of the institution very much.

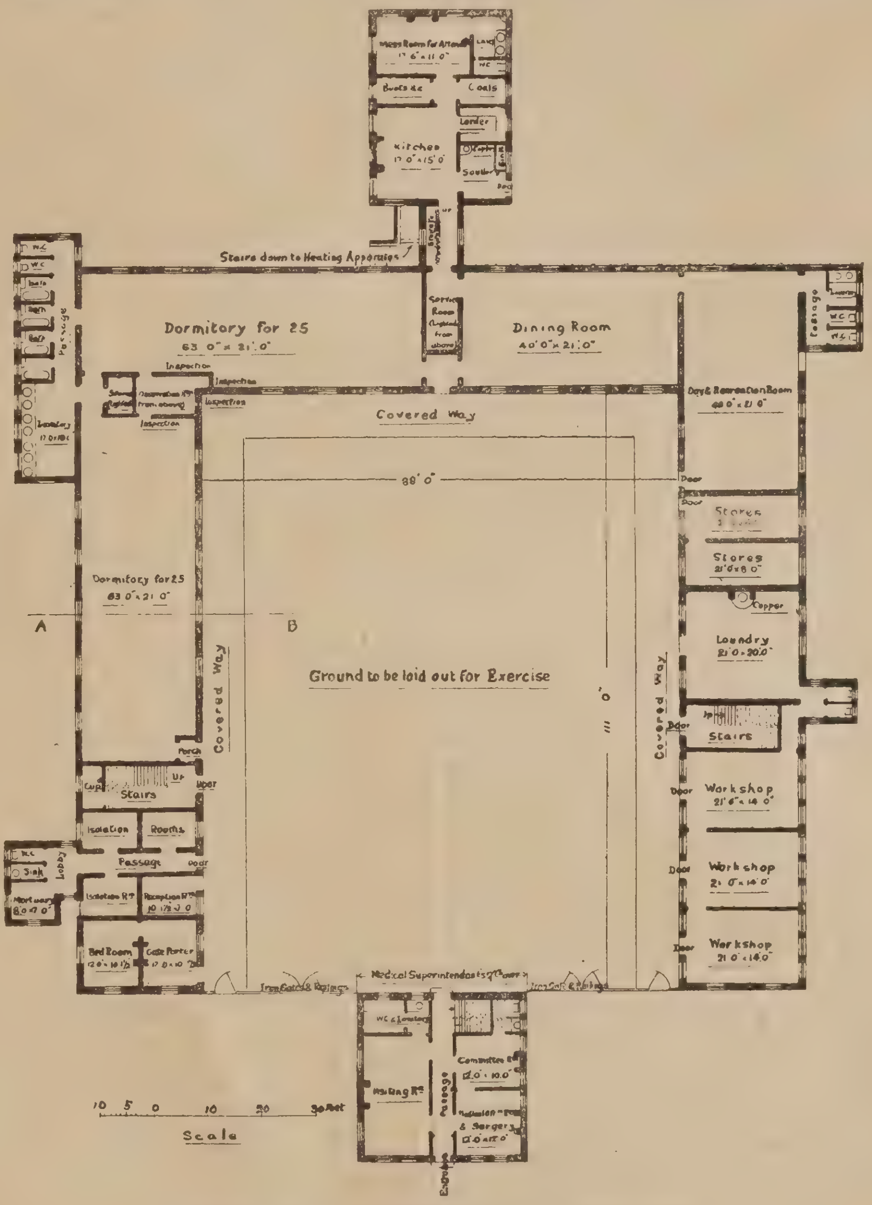
There is a considerable advantage gained by placing an observation room between two dormitories, as shown on the plan: by this means one night attendant would be sufficient o overlook the whole of the patients when in bed, and this attendant should have ample means of communicating with the superntendent and other officials should occasion arise during the night. From this observation room there would also be a view of the courtyard where the patients would be exercised; but the general arrangement of the dormitories and observation room might be greatly improved, as will be shown hereafter. Lavatories and sanitary requirements generally are placed outside the main walls, but this portion also equires considerable amendment.

A few isolation rooms are also provided, but ese are much too small, and should not be s, as regards area and cubical contents, than ould be required for an ordinary police-station ell: one room at least should be provided for nruly or unmanageable cases. I have in a ormer series of articles in this journal given ull particulars, plans and details of the construction, planning, doors and windows of olice cells, with numerous illustrations, and or some apartments in inebriate reformatories imilar construction and arrangement would be esirable.

All outside windows should consist of iron rames, with a restricted opening at the top for ventilation. Internal provision for work and exercise being provided, any patients unfit to be trusted amongst outside labour gangs can be wholly retained without damage to health and without entailing excessive supervision. Under this arrangement also, when work is done and patients are off duty they can be allowed to occupy the recreation room, or roam about the quadrangle at pleasure, engage in amusements, or otherwise employ themselves without constant watching, the superintendent being sufficiently assured of their safety.

All superfluous decoration should be avoided, both of the exterior and interior of the buildings, which, however, should be rendered as cheerful and attractive as due considerations of economy will permit.

The stairs should be built of stone, oak, teak, rock-maple, or of some other fire-resisting material, without winders or long straight flights, and with risers not more than 7½in. high and treads not more than 10in. wide; the well should be built up, or a newel wall provided, and handrails should be provided on each side of every flight and round the landings.



GROUND PLAN OF REFORMATORY FOR INEBRIATES.

The walls should be so constructed as to exclude damp effectually; wherever practicable, horizontal and vertical fire-resisting construction and materials should be adopted; the ceiling next below the roof in all parts of the reformatory occupied by patients should be constructed throughout of incombustible materials.

In all cases it is desirable to avoid descending or horizontal smoke flues; but when used they should be constructed with iron pipes enclosed in covered brick channels, and flues from any close fire or furnace which are carried up in any of the walls should be constructed with a hollow space round them, to prevent the inconvenient transmission of heat into the building during the warmer periods of the year.

Hydrants should be placed in convenient positions on all the floors, and external mains with hydrants provided by which water could be thrown over any portion of the building. It is often convenient to have the internal hydrants enclosed in cupboards large enough to contain the hose when attached to the hydrant and the nozzle.

All day and sleeping rooms should have wooden floors, and where boards are used they should be grooved and tongued; oak floors are preferable for the corridors and day-rooms and for isolation rooms for patients of a certain class; but where oak is not used it is advisable that the boards should be of the best yellow deal, pitch-pine, or rock maple, of narrow width and thoroughly well seasoned; all boarded floors should be prepared for dry rubbing; the floors of sculleries, lavatories, urinals and water-closets should be of terrazzo, cement, tiles, or other non-absorbent material; a layer of cement-concrete, not less than 4in. thick, should be laid under all boarded floors at the ground level. No timber inserted in any wall should be placed within 9in. of any smoke flue, and no plug should be driven within 6in. of the inside of any flue. The walls generally should be plastered or cemented internally; those of lavatories, bathrooms, w.c.'s, sculleries, laundries and kitchens should be lined to at least dado height with glazed bricks or tiles, and where the walls above are plastered it is an advantage to use adamantine plaster or Parian cement. No hollow or other mouldings likely to harbour dirt should be introduced.

To secure cross-ventilation, the windows of the larger apartments should be placed (where practicable) on both sides; the windows of the day-rooms and corridors should be of sufficient size and number, and bear due relation to the probable arrangement of the furniture and fittings; the lowest clear glass should not be more than 2ft. 6in. from the floor; the windows should have wooden sashes, double hung, and be made to open easily so as to allow a free circulation of air; the wall below the sills of windows in dormitories may be splayed, but in day-rooms it should be recessed to admit a seat, if required; in the dormitories and isolation rooms the windows may be placed with the bottom sill not more than 4ft. from the floor.

The condition of a certain proportion of the patients might possibly be such that, if not otherwise protected, the windows in all parts occupied by patients should be stopped so as to allow them to be opened top and bottom (not more than 5in.), the sashes being hung with hidden cord. These precautions, especially upon upper floors, might prevent delirious patients from attempting suicide, or from injuring themselves during the earlier periods of their detention, at which time they are more liable to outbreaks, as a result of their previous habits of intemperance.

Except for the fact that large dormitories enable the officials to obtain a good observation of a large number of the patients, it would for various reasons be desirable that there should not be more than six patients in each room (by placing the observation room between two such dormitories one official could be in charge of twelve patients); there should also be a fair proportion of isolation rooms for one patient each. The doors of all of these apartments should open outwards, and be so hung that when open they will fold back close to the wall. Those for rooms to be occupied by patients of an excitable or delirious temperament should be especially strong, and those for rooms occupied by patients who require to be closely watched should have an open panel 3½in. wide in the centre of the door, and so high above the middle rail that the occupant could not put his hand out far enough to reach the outside handle of the door. The locks for all such isolation rooms should be dead-locks, and contrived so as to open (when not doubly shot) by a handle on the outside.

All day-rooms and dormitories should have a sufficient number of open fireplaces, but additional means of warming, upon a suitable system, should also be provided for all large spaces for which open fireplaces would be insufficient, and also for the majority of the isolation rooms, and for lavatory and bathroom annexes.

Every part of the building must be thoroughly ventilated, not by artificial or costly mechanical appliances, but by some natural system, the fittings of which would not be likely to get out of order through any neglect of the officials or through damage caused by the interference of the patients. For this purpose Boyle's air-pump ventilators (combined with a suitable number of fresh-air inlets), of the right size, in suitable positions, and as arranged for by a specialist, would probably accomplish all that is desired at a moderate outlay. Experiments have been made with two or more systems of ventilation in combination; the results, so far as my experience informs me, have always been unsatisfactory on the grounds of costliness and want of efficiency, or on both of these accounts.

The w.c.'s should be of the wash-down pedestal type, with hinged hardwood seats, to lift up as urinals in all cases; each closet should be flushed by a separate flushing cistern (of the greatest capacity allowed or approved by the local authorities of the district). The pulls should be enclosed in tubes attached to the wall, or have concealed wires with flush slots; all pipes should be carefully cased in or protected, and all gas brackets or pendants and partitions between closets should be so constructed or fixed as to avoid facilities for suicide, the desire to commit which has frequently arisen as the result of mental depression following enforced confinement and the sudden withdrawal of intoxicants. For this reason it would be much safer that all lights, brackets and taps connected with gas should be safe from the interference of patients who might turn on the gas or break pipes for the purpose of procuring death by suffocation or by hanging themselves on the brackets, &c.

Means of flushing should be provided and the drains and sewers properly ventilated, and, especially, all waste-water pipes must be disconnected from the drains; soil pipes should be placed outside the walls and be thoroughly ventilated by equally large pipes carried above the roof, and they should deliver into properly ventilated chambers or manholes

Rainwater from the building should be collected in a tank or tanks, suitably placed, for the purposes of the wash-house and steam boilers, and the material used for pipes and cisterns should depend upon the quality of the water, as ascertained by analysis.

The enclosed airing or central court should be as spacious as practicable: it should be planted with trees and shrubs, and if there are any good trees already on the site an effort should be made to so arrange the plan that they may be preserved for shade. Seats and properly constructed sunshades should be provided.

As in the case of hospitals, asylums and workhouses, &c., it is very desirable that all water-closets, lavatories, &c, should be placed in projections or annexes, with a lobby not less than 4ft. 6in. wide, with cross-ventilation separating the apartments occupied by the inebriates from the water-closets. In addition to the baths in the wards in a large institution there should be general bathrooms or houses, conveniently placed and containing baths with good dressing-rooms attached. In the case of one or more bathrooms the bath should be placed in the centre of the room, with the foot to the wall, so that the attendants could bathe a refractory patient without great risk of injury to themselves or the patient. The baths should be of Stourbridge ware, and should not be enclosed in woodwork, but might have a hardwood capping; the top of the bath itself should not be more than 22in. from the floor. It is of great importance that the taps, as well as the supply and waste pipes, should be of large size, so as to allow a ready change of water for each patient, and further that the hot and cold water supply-taps should be plainly distinguishable. The openings for the supply and waste should be quite separate.

Provision should be made for separate bedrooms for attendants in connection with each pair of dormitories, each bedroom having an area of not less than about 100ft. superficial, and being provided with inspection windows looking into each dormitory; but the door of the bedroom should lead into a passage, not to a dormitory.

As a general rule it would probably be most advisable to place the general stores, workshops, laundry and similar offices at the north end of the buildings (the entrances to those portions being also at that part), it being arranged that there need not be more than one outer entrance to the steward's and workshop departments; this should be conveniently placed for control by the storekeeper or other responsible official.

The workshop department should include shops of ample size for carpenters, painters, plumbers and engineers, with a smithy adjoining—also a shed for bricklayers and masons; all opening on to the central courtyard and conveniently arranged for the delivery of materials. There should also be shops for upholsterers, tailors and cobblers. It would be convenient to associate with the cobbler's shop a central boot-cleaning room, where boots could be changed on the return from work on the land, and dried and examined for repairs.

The extent to which farm buildings should be provided depends upon whether the district to be served is, or is not, an agricultural one, but in most instances there should be accommodation for stock and some stabling for horses, with piggeries and fowl-houses, &c.

If an inebriates' reformatory could be arranged in two sections (for males and females), the laundry work for the whole establishment could be performed by the female inmates to their own advantage (as regards a suitable form of employment being provided for many of their number) and to the benefit of the institution from a financial point of view. In such a case well-arranged laundry buildings, with a sufficient drying ground, must be provided on the females' side of the reformatory. A separate washhouse for officers' and attendants' linen is desirable, and also, in large institutions, a separate washhouse for very foul linen. Appliances of the most efficient description for drying clothes should be provided, and a room with apparatus for washing and drying horsehair for beds would be found useful (if in connection with the upholsterer's shop). As will be perceived by comparing the above remarks with the accompanying plan, the arrangement proposed for a laundry in the Home Office scheme would be altogether inadequate.

Rooms of sufficient size for the reception of visitors, with lavatories and water-closets, should be provided in connection with inebriates' reformatories: these should be within a reasonable distance of the general entrance, and so placed that the visitors need not have to penetrate the inner portions of the premises more than necessary.

The staircases should be of such a number, and be so situated, as to afford ready means of exit to all patients in the event of fire or panic, and so as to enable the medical officer, attendants and others, to pass from one part of the premises to another without unnecessarily retracing their steps. Every dormitory should have two exits, and if on the upper floors these should lead to different staircases.

One or more suitable hospital or infirmary wards should be provided, containing a dormitory for a few associated patients, one or more rooms for isolated cases, a day-room, nurses' duty-room, with range, &c. If only to be on one floor, the ground floor is to be preferred for the purpose. Infectious cases would be best removed to a special public fever hospital, unless the inebriates' home should be planned on a large scale and for a great number of persons.

As in the case of county lunatic asylums, the day-room space for inebriates' reformatories may be provided either in the form of one or more rooms, or of a room or rooms combined with a gallery not less than 10ft. wide. In each case the floor space per patient should be at least 40ft. superficial. If provided by a room or rooms and gallery, the space afforded by the gallery portion must not exceed 20ft. superficial per patient. A convenient arrangement is a gallery of adequate width with a room or rooms at one or both ends. The windows of the gallery should, if possible, have a southern aspect.

The dormitories for associated clean and healthy patients should allow a floor space of 50ft. superficial to each bed or patient, and the rooms for isolated patients should contain 63 superficial feet, but the space in the dormitories and isolation rooms of the hospital wards should be at least one-third greater than these dimensions. The general height of each storey should not be less than 12ft. in the clear, from floor to ceiling; no associated dormitory should be for *less* than three patients.

In connection with each ward there should be a ward scullery, an ample lavatory, with basins in the proportion of one to every six patients (their wastes discharging into an open outside channel), a slop room containing a sink, storerooms for clothing, bedding, crockery, brushes and other articles for use in the wards, one or more baths and water-closets in the proportion of one for every ten patients, with an extra closet in each block for the separate use of the attendants; also a boot and hat room near the door leading to the grounds.

In all large inebriate reformatories it would perhaps be desirable that there should be a small ward in which newly-admitted patients could be placed under special observation, with a view to ascertaining if any peculiarities exist or if any particular course of action should be pursued with regard to their treatment. In all such reformatories one or more dormitories with a few isolation rooms communicating should be set apart and arranged for the care and supervision, during the night, by special night attendants, of unduly depressed or unnaturally excitable patients, who might develop dangerous mania with regard to themselves or others. As a certain proportion of those to be detained in inebriate reformatories is likely to be added to those already housed in asylums, as the result of intemperance, it is desirable that no precautions should be omitted with the view of providing against the dangers likely to arise from persons developing symptoms of insanity while detained in an inebriates' reformatory.

It may sometimes be advisable to build an inebriates' reformatory for a number of patients *less* than the maximum number to be ultimately accommodated; the institution should then be in the first instance designed for that maximum number, both as regards the administrative departments and the wards, and the buildings which are ultimately intended to be erected to complete the plan should be indicated in outline, if not fully, on the plans.

A general dining-hall for the patients, of ample size, conveniently situated with reference to the kitchen and capable of being used for purposes of recreation, should be provided; a day-room might be added, when necessary, by the removal of separation doors or shutters; a scullery and other requisite offices should be attached to the dining-hall; mess-rooms for the male and female attendants, capable of being used in the evening as sitting-rooms, may be provided in the smaller institutions, but larger establishments should be provided with distinct apartments for mess-room and sitting-room purposes. If the reformatory is to be a very large one, it would perhaps be well that the medical superintendent should have a detached residence within the grounds of the institution, which might, however, be connected with the main building by a covered or enclosed passage.

Suitable apartments may be required also for an assistant medical officer or officers, and for the steward, matron and chief attendants; if the employment of a married head male attendant is contemplated, a cottage in convenient proximity to the institution (and within the grounds) should be provided.

There should also be some sleeping accommodation for the domestic servants of the institution; in large reformatories it may be convenient to provide, in detached buildings, sleeping accommodation for some of the attendants, and also cottages for ordinary married attendants, should such be employed on the staff.

The chapel should be an annexe to the main building, and be connected therewith by a corridor, and most certainly be on the ground floor: it should have, as far as may be, the usual character of a church. To place the chapel and library on an upper floor, as arranged on the Home Office plan, appears to me to be a great mistake. The library especially should be on the ground floor in a very accessible position, with a good supply of amusing and instructive books, and not (as is occasionally the case) with almost exclusively theological works.

A mortuary, consisting of two apartments, and a post-mortem room, supplied with a washing-up sink, should be provided in a position easily accessible from (but as much as possible out of sight of) the reformatory buildings. For large institutions there should also be a waiting-room for patients' friends or for a coroner's jury, with proper lavatories, &c.

If a reformatory should be built on a very large scale for inebriates, it would then become advisable that there should be a small detached hospital for the isolation of patients suffering with infectious diseases: it should include a kitchen, small laundry and disinfecting rooms and apparatus; also accommodation for a caretaker and his wife, and for day and night attendants. The cubic spaces in such a building must not be less than 2,000ft. for each patient in the dormitory and isolation wards, and the general arrangements would correspond with some of those shown in those illustrations of fever hospitals that have frequently appeared in this journal.

(*To be concluded.*)

Professional Practice.

Aberdeen.—The plans for the new Greyfriars Church have been prepared by Mr. A Marshall Mackenzie, A.R.S A., and the work is now being proceeded with. The south elevation of the church faces Queen Street. The building has been designed in the English Perpendicular style, so as to harmonise with the general scheme of the University buildings. The main feature of the design is a large tower which forms the front of the church, and is in line with the front of the University block, with which it will be continuous. The tower, which, including the buttresses is 32ft. sq., rises to a height of 100ft., and is surmounted by a steeple 50ft high. The frontage to Broad Street consists entirely of the tower, on the south side of which is the gable of the aisle, recessed to the depth of the tower. The front elevation of the tower contains the principal arched entrance, which is in the centre of the tower in the front. The entrance is approached by a flight of steps, and is surmounted by a richly-moulded arch. The church consists of a nave and an aisle on the south side towards Queen Street. The aisle has a sloping roof, and is lighted by lancet-shaped windows of three principal lights, buttresses intervening between each pair of windows. The clerestory is lighted by square-shaped windows, each divided into three lights by vertical mullions. In the interior the nave, which is 40ft. high is separated from the aisle by a series of three arches resting on massive pillars. The interior is lighted by the clerestory windows combined with those of the aisle, while in the end wall of the chancel a place has been found in which to replace the south window of the old Greyfriars Church. The nave is divided by a central passage leading to the chancel at the east end. The pulpit is placed on the north side of the chancel, and behind it is the entrance to the minister's vestry. At the south-east corner is situated the organ chamber, and adjacent to it in the aisle are the choir stalls. A small gallery is inserted in the west end of the church over the vestibule. In the vestibule there is placed a church officer's room. The church is seated for 800. Below the church there is a hall and other necessary accommodation, entrance to which is obtained at the south-east corner of the building. The hall is lighted by square-shaped windows, room for which has been found by keeping the floor of the church well above the sloping line of the street. The hall is seated for 300 persons, and the other accommodation includes a session-room, a Guild-room, and a tea-room.

Blackpool.—A new Board school is being erected in the Devonshire Road district with accommodation for 1,000, the estimated cost of which is about £14,000 Messrs. Cardwell Bros. are the contractors. Mr. R. B. Mather is the architect, and Mr. C Place the clerk of works. The elevations of the school will be faced with Accrington brick. The main elevation is in Devonshire Road, and is more ornamental than the others. A special feature has been made in the central hall, which will have a central gable flanked by two gables on the north and south wings. The infants' and the juniors' departments are to be on the ground floor. There will be six class-rooms of the average size of 24ft. by 25ft., an infants' room 31ft. 6in. by 24ft., two separate cloak-rooms for juniors and infants 27ft. by 22ft., and mistresses' and teachers' rooms. There will also be a room for instruction in cookery at the girls' end of the building, with a separate entrance, cloak-room, and scullery attached, with store closets for books and utensils. The area of the central hall is to be 64ft. by 32ft. From the hall a view of all the class-rooms can be commanded, as there are to be glass screens all the way round. There will be large separate playgrounds for the boys and girls and infants, and in the girls' playground there is to be a detached building for laundry purposes. In the boys' playground there will be a joiners' workshop. In the yard there are to be verandahs, which will afford shelter to the children in wet weather, or when they arrive early. There will be cellars under the north end of the building for heating apparatus and storage purposes. The boys' entrance will be at the north end and the girls' at the south end of the building, their rooms being reached by four stone staircases. There are to be eight class-rooms, about the same size as those below, on the floor. The central hall will be the same size as the one underneath, and the masters' and the mistress's rooms will have command of the playground, as they project. The central hall on this floor will have an open principal roof, and the floors throughout will be wood block. The building will be heated throughout with hot water flow and return pipes, and radiators in the corridors on the low-pressure system.

Northampton.—A new Congregational Church was dedicated recently. The site has a frontage to Abington Avenue and abutting on Roe Road and Allen Road. Only part of the site has been built on at present, efforts being confined to the school-chapel which has been erected at the Roe Road corner of the site. Ground is left for a church, and in a few years the erection of a church will be taken in hand. For the present the school-chapel will meet the requirements of the neighbourhood. The buildings, which have been erected from the designs of Messrs. Charles Dorman and Son, 51 Abington Street, are planned with the principal entrance from Abington Avenue and a side entrance from Roe Road. On the ground-floor is the school-room, which is 44ft. 6in. long by 28ft. wide, with small class-rooms at one side and the infants' school-room, 28ft. 6in. long by 21ft. wide, with two class-rooms 10ft. by 10ft. On the first-floor is a large assembly hall, 50ft. 6in. by 40ft. 6in., with large well-lighted vestries and retiring rooms at the rear. This hall will for the present be used exclusively as a chapel. In the basement is a large kitchen, with the usual fittings, and also a store-room and heating chamber. Special attention has been paid to lighting and ventilation. Each room is well supplied with windows, which are large and spaced with regard to internal requirements, and supplied with opening casements for the admission of fresh air. The foul air is extracted through perforated panels in the ceilings, connected to a large ventilating duct in the roof by means of a powerful air-pump ventilator fixed on the ridge of the roof. The staircases are spacious and airy, the stairs are constructed of fireproof material, and there are numerous exits in case of emergency. The total cost has been about £3.500. Messrs. Wingrove and Stanley, of Northampton, were the builders.

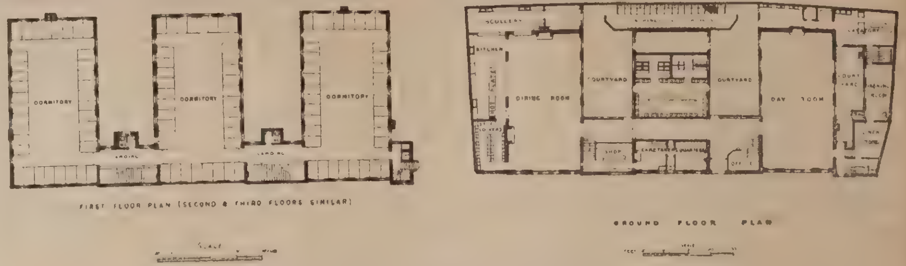
Wolverhampton.—At New Cross, Wednesfield, the Wolverhampton Guardians are building a new workhouse—a collection of buildings which, with the associated grounds, will cover a total area of some 50 acres, or an extent about equal to the Wolverhampton West Park. The total cost of this undertaking has been estimated at about £153,000. The erection of the new institution was commenced in March last. When completed the new workhouse will comprise 10 sections. Of these, the administrative section, which will comprise eight blocks, will form the main part, and the detached blocks will include the vagrant ward, mortuary, and farm buildings near the public thoroughfare. On the north side will be situated the workshops (with labour master's house). The nurses' home will not be far away. The medical officers' block will be fairly central, while away to the east ward (or the right-hand side looking from the public highway), will be situated the infirmary wards and other buildings. The workshops are tile-roofed; they comprise a range of shopping (with residence), and are built on the four sides of a quadrangle. The system of drainage consists of an underground tunnel connecting all parts of the institution, and in this tunnel all drainage pipes, gas pipes, water pipes and electric mains will be laid. The tunnel is large enough at all places for a workman to reach the mains, and he would, if necessary, be able to make a complete circuit of the entire buildings without coming to the ground. Thus any defect which may occur will be remedied without any cutting up of floorings, &c. Access to this passage will be, of course, obtained at various points. In the infirmary wards the male and female sides are so arranged as to be kept quite distinct, each being under the immediate sight of the superintendent, whose room is placed in a central position. The infirmary wards will comprise two storeys each, and there will be 24 beds in each ward, which will be twelve in number. Special attention has been given to the medical officer's block, which is almost completed, and the arrangements include all the apartments necessary for the medical officer, dispensary, kitchen, &c. The female infirmary is a replica of the male division. The isolation hospital will provide for four patients. There are laundry buildings, and a special nurses' home will have bay windows, a visitors' room, a garden, and tennis lawn. The house is built to accommodate a nursing staff of forty. The married couples (for sixteen couples) and nursery blocks, the workhouse blocks, and the apartments for mothers with children are also now being erected. The married quarters will also have a south verandah and balconies. The vagrants' ward will be provided with a laundry in the basement, and the farm buildings include piggeries, stables, fowl-house, barn, &c. The building of the Board-room at the workhouse, at an estimated cost of about £3,000, is to be proceeded with. The exterior materials being used are in general red bricks. Mr. Arthur Marshall, A.R.I.B.A., is the architect of the work.

LONDON HOUSING, 1855–1900.

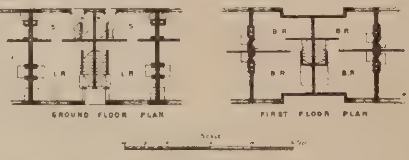
THE COUNCIL'S BOOK.

AN account of the housing work done by the Metropolitan Board of Works and the London County Council between the years 1855 and 1900 has recently been published in book form by the Council. It has been prepared under the direction of Mr C. J. Stewart (Clerk of the Council) by Mr. W. J. Russell and Mr. M. H Cox, LL.B. (Lond.), and is undoubtedly the most comprehensive book on this subject An important change in the policy in regard to the housing of the working classes took place with the institution of the London County Council in 1889, for they then decided to abandon the old method of the Metropolitan Board of Works—that of disposing of sites to companies for the erection of working-class houses—and to build, let, and maintain dwellings themselves To Mr. Stewart one of the clearest conclusions to be drawn from the investigations of the Royal Commission of 1884–85 is in connection with the activity of local sanitary authorities in making and enforcing the provisions of by-laws as to houses let as lodgings. Indeed he is convinced that the good effect of the work which the Council is now doing in providing working-class accommodation will be seriously impaired unless local sanitary authorities can be stimulated into enforcing the provisions of such by-laws so as to prevent the overcrowding of, and thus reduce the rents that can be asked for, the houses which, in the poorer parts of London, are let in tenements of one, two, or more rooms.

As is pointed out in the opening chapter of this book, until 1851 the Legislature did not concern itself with the quality and quantity of the working-class houses in the metropolis. It was then that the Earl of Shaftesbury (then Lord Ashley) drew attention to the disgraceful state of things, and as the result of his efforts two Acts (commonly known as Lord Shaftesbury's Acts) were passed—the Labouring Classes Lodging-houses Act and the Common Lodging-houses Act. The aim of the former was to increase the number of working-class houses by facilitating the establishment in populous districts of well-ordered lodging-houses, while the latter endeavoured to improve the quality of the dwellings. The Nuisances Removal Act of 1855 authorised a vestry or district board to take proceedings against overcrowding in a house occupied by more than one family, while further power was given by the Sanitary Act of that year. In 1868 was passed the first of the series of Acts known as "Torrens' Acts." It applied to individual houses, and its main principle was that "the responsibility of maintaining his houses in proper condition falls upon the owner, and that if he fails in his duty the law is justified in stepping in and compelling him to perform it." But the primary object seems to have been repair and patching up, rather than radical improvement. This Act was followed by the Artisans' and Labourers' Dwellings Improvement Act of 1875, which was the first of the series known as "Cross' Acts": it contemplated dealing with large insanitary areas, which were to be demolished or reconstructed. The Metropolitan Board of Works found, however, that the working of this Act was dilatory and costly; therefore it was amended (in 1879), though little good was effected. In the same year Torrens' Act of 1868 was also amended. But after these Acts had been in force for some years it was found that very little was being done under them, and in 1881 82 a Select Committee of the House of Commons sat to consider what further amendments could be made to stimulate action on the part of the authorities. The result of the Committee's report was the passing of the Artisans' Dwellings Act of 1882, to amend both Torrens' and Cross' Acts. Still it was felt that the progress being made was unsatisfactory, and a Royal Commission was appointed in 1884 to enquire into the whole matter. This resulted in the passing of the Housing of the Working Classes Act, 1885. Three years later the Local Government Act constituted the London County Council the authority in place of the Metropolitan Board of Works, and this marks the dawn of a new era. During 1889 the Council fully considered what improvements in the law were needed for the better housing of the working classes, and as the result of their representations to Parliament the consolidating Act known as the Housing of the Working Classes Act, 1890, was passed. It is divided into seven parts: the first is a consolidation (with amendments) of Cross' Acts; the second part is a similar consolidation of Torrens' Acts; the third part consolidates the Labouring Classes Lodging-houses Acts of 1851 and 1867; while the other parts deal with minor matters. After this we have the Public Health (London) Act of 1891, the London Building Acts, and the Housing of the Working Classes Act, 1894, which completes the legislation now in force in London in regard to housing. In carrying out their work the chief difficulties in building which the Council have to encounter are the high price of land, which leaves a very small margin to provide for interest and sinking fund upon the estimated cost of construction, and the increase in the price of labour and materials. "The combined effect of this rise in the cost of materials and rates of wages and the decrease in the number of bricks laid per diem has been to raise the price of brickwork per rod from £11 in 1890 to £20 15s. at the end of 1898." During 1889 and 1900 there were displaced 7,845 persons, 6,956 of whom were rehoused, while dwellings are in course of erection to accommodate 4,956; and 8,339 more will shortly be displaced, for whom additional dwellings will be erected.

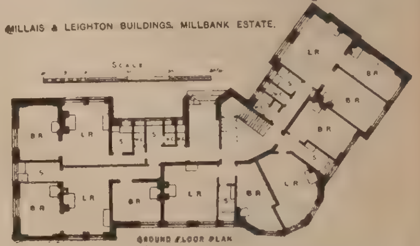


MEN'S LODGING HOUSE, PARKER STREET, DRURY LANE, W.C.



BROOK STREET COTTAGES, LIMEHOUSE.

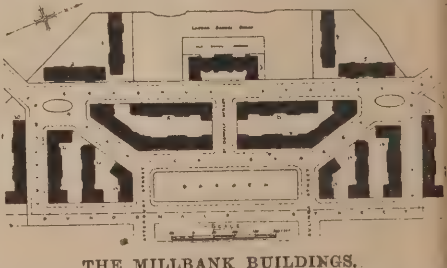
It is impossible now to go into any details of the numerous schemes which have been carried out or are still in progress; a great deal of such information has already been published in our columns; and it will only serve our purpose to state a few facts in regard to the accompanying plans.



In 1890 the Council decided by the application of Part III. of the Housing of the Working Classes Act, 1890, to build and manage a municipal lodging-house on a site in Parker Street, Drury Lane. They further decided to invite competitive designs, and those of Messrs. Gibson and Russell were accepted. The contract was secured by Messrs. Holloway Brothers, and the building was opened in January, 1893. Accommodation is provided for 324 men. The total cost amounted to £22,136, made up as follows: — Site, £3,750; cost of erection, £17,213; furniture, £1,172 The house is of fireproof construction throughout and has 324 separate cubicles.

By Section 3 of the Housing of the Working Classes Act, 1885, the Treasury was empowered, in the event of the Millbank Prison being demolished, to sell to the Metropolitan Board of Works a portion of the site for the erection of working-class dwellings. The Council approached the Treasury, and after some trouble the price of £2,500 an acre for about half the site was agreed upon. At the present time the Millbank estate is covered with a number of admirable buildings in red brick, which are named after various British artists. The following is a key to the accompanying plan:—1 and 2, Gainsborough Buildings; 3, Hogarth Buildings; 4 and 5 Reynolds, Buildings; 5 and 6, Romney Buildings; 7 and 9, Turner Buildings; 8, Rossetti Buildings; 10, Wilkie Buildings; 11, Lawrence Buildings; 12, Landseer Buildings; 13, Leighton Buildings; 14, Millais Buildings; 15, Mulready Buildings; 16, Maclise Buildings; 17, Horland Buildings. The Millais and Leighton Buildings were completed in 1898

Each of the cottages on the Brook Street area, Limehouse, consists of three rooms and a scullery. In all 306 persons will be accommodated. Of these cottages Mr. Chaplin said in the House of Commons that "in point of economy and accommodation they left very little to be desired."



THE MILLBANK BUILDINGS.

Anyone desiring to obtain full particulars of all the housing schemes carried out in London by the Metropolitan Board of Works and the County Council should consult this excellent book.

ARCHITECTURAL ASSOCIATION.

ARCHITECTURE IN CRETE AND TURKEY.

BY D. A. FYFE.

A MEETING of the Architectural Association was held on Friday evening last at 109 Conduit Street, Mr. W. Howard Seth-Smith, president, in the chair. The minutes of the previous meeting having been read and confirmed, Mr. Seth-Smith proposed a vote of condolence with the King and the Royal Family in their late bereavement. The motion was seconded by Mr. R. Elsey Smith and passed in silence, all the members standing. Mr. William A. Pite, senior vice-president, then took the chair on Mr. Seth-Smith having to leave. The following gentlemen were then elected members of the Association :—Messrs. A. F. Benjamin, W. J. Brough, B. A. Everitt, A. H. Fleuss, A. P. Lambert and E. A. Temple. Mr. D. A. Fyfe then read his paper on "Some Architecture in Crete and Turkey," which was illustrated by a number of photographs and drawings round the walls. The following is a summary of the paper :—

Like all Greek lands, Crete belongs to the dawn of history, and is rich in remains of that Mycenean civilisation, about which so little is known. This period, however, belongs more to the domain of archæology than of architecture, as also, in the case of Crete, do the Greek and Roman periods ; their remains being so scanty as to afford little architectural interest. After the decline of the Roman period the island was conquered by the Saracens in A.D. 820 ; then by the Byzantines in 961 ; but to Venice belongs the chief mediæval period, which lasted from 1204 till the final conquest by the Turks in 1669. The island in its most representative aspects is Venetian. Under the Turks how rebellion followed rebellion is matter of well-known history. It is certain that Crete held an important place in the Early Egean civilisation. Homer mentions it as a land of ninety cities, from which we can infer that it was highly populated. The sites of many of the Homeric cities have been identified, and are now partially disclosed, notably, Knossos, Gortyna, and Ghoulas. In their construction we notice the same characteristics which are displayed in the Palaces of Tiryns and Mycenæ, in the mainland of Greece, excavated by Schliemann and Dr. Dörpfeld, &c. In all are the same mud (or rubble and mud) walls, mysteriously appearing to be contemporary with Cyclopean masonry ; the same circular stone column-bases and paved areas. Only Knossos has produced some entirely new forms of architectural plan and detail, and such a collection of painted stucco, both existing on the walls and in fragments, as to make it quite unique in the Levant. Looking at this stucco as a means of decoration, it is noticeable that two distinct scales seem to have been employed. One, comparatively easy to appreciate now, consisting of life-size representations of figures, bulls, gryphons, etc., or conventional representations of landscape. The other consisting of very small objects or figures produced in a more brilliant style, and found in such small fragments as to make it hard to understand how it could have been used. From this latter variety some very interesting architectural representations are apparent, which help to elucidate the subject of Mycenean building. The art displayed at Knossos is the complete fruition of the genius of the time. Though some of the finds at Vaphio, in Greece, are quite as artistically mature, a comparison of Knossos with either Vaphio or Mycenæ is futile at present, as so much of the treasure of the latter comes from the tombs, which in the Cretan site have not as yet been discovered. But in the palace itself enough has already been found to show that in this reputed home of the art of Dedalus, a very keen, strong perception of natural forms existed, and a direct getting at nature behind an indefinable veil of conventionality, which gives the art of this epoch a distinct value of its own. In building, the outer walls, which may have been more or less fortifications, are based on ponderous squared blocks of gypsum, which weathers with water grooves, like the hard calcareous substance of a cave. The bases of many walls in limestone and gypsum have been found very accurately levelled and laid out, but it still remains a problem in many cases whether the superstructure was of the same substantial material or of mud to take stucco work. Nothing of direct evidence has been found to point to the existence of later Greek or Roman settlements over this primitive one of the palace at Knossos, though many Roman fragments exist in the vicinity. The site of Ghoulas is an Acropolis much more approaching the wild and inaccessible character of Mycenæ than the refined and civilised Knossos. Splendid polygonal masonry exists here, forming ramparts up a steep hillside which overlook a truly Greek prospect of hill and plain. And here also are picturesque evidences of a later Roman settlement on the Acropolis itself. But Crete has no prominent Roman architectural remains above ground that would bear comparison with those of Italy, Greece, and Asia Minor, and be of much help to the student in his search for the historic links which bind the Imperial Art to the Romanesque and Renaissance of later times. Coming to more modern times we notice also that Crete has passed through so many vicissitudes, and fire and sword have wrought in it such havoc, that its present day can show but little of permanent architectural value above ground. Whatever it was in early times, both under the Venetians and the Turks, it formed but an outpost station, very liable to attack ; so it is not surprising if the engineering of walls, and the useful side of architecture generally, form a large part of what is to be seen in the island to-day.

The more modern architectural remains of Crete include :—1. Churches and monasteries in a pseudo-Byzantine style, similar to those met with in the country districts of Greece. 2. Buildings of the early Venetian period, in which the pointed arch was employed. 3. Later Venetian buildings in a provincial Renaissance style. 4. Turkish buildings, which are mainly domestic, and in plain stucco. The town of Candia contains examples of all of these, except the first, though it has also been sadly deprived of much that was apparently interesting of the Venetian period. The great defence of Crete against the Turks in the seventeenth century was a matter of such interest to the Christian Powers of Europe that we fortunately possess some literature on the subject, and contemporary plans of the fortifications of Candia, the siege of which lasted for more than two years, and became one of the most memorable in history. Many of the original fortifications, especially on the north side, exist to the present day in a good state of preservation. The nature of the harbour has been taken advantage of much in the same way as at Rhodes ; and the fortifications of the two towns resemble one another, both being more irregular than those of Nicosia in Cyprus. The Candia walls are good examples of their class, but they have no prominent towers and no decorative details of interest, except the occasional panels with the Lion of St. Mark, and a few small carved coats of arms. So they are probably inferior in general interest to those at Famagusta, in Cyprus, and those at Rhodes. There are three principal gates in existence, all Renaissance of the Venetian period : the Canea Gate, the *Kainourio*, or "New" Gate, and the Lazaretto Gate. This last is probably the most interesting of the three, and has a long vaulted passage from the ornamental inner gate to the outer entrance. This passage is barrel-vaulted in rubble and descends fairly rapidly towards the outside. It turns sharply to the left at the end, so that there is an intersection, over which is a dome lit with a single eye : that when the outer gate was shut the passage would not be in darkness. The form of the inner gate, with its pediment, is quaint ; but the details are coarse and in no way improved by much whitewashing. The *Kainourio* is more commonplace than the Lazaretto, but is of naked stone, and has a good quiet cornice. It forms the entrance to the town from the interior of the island, and the present roadway really crosses what was the moat of mediæval times. It has also a long vaulted passage from inner to outer gate, though not so remarkable as the other. The Canea Gate has even less of architectural interest than the other two. It has no vaulted passage, being merely in the thickness of the wall, and it leads to the high road that runs eastwards along the north shore of the island, towards Retimo and Canea.

Leaving the walls and gates now, and entering the town by the harbour, we see first the remains of the great arches of Venetian Gothic which formed the arsenals of the mediæval town. They were, no doubt, complete before the great siege. Now, in their ruined state they are used as boat slips. The responds which exist on the back wall show that there must have been ribbed and groined vaults there, and the piers that exist are massive enough to show the large scale of the whole. Leaving the harbour, we pass up a sloping street to the centre of interest—the market square—at the highest part of the town. Streets radiate in all directions, but the interest here is diffused, and the square is only a quiet aside. The throng of the markets is at another meeting of streets a few yards from it, surrounded by low, squalid buildings, with here and there a crazy, whitewashed dome. The market square however, has a fine old Venetian fountain in the centre, surrounded by a Turkish marble and wrought-iron grille. The only large building in the town of any character is the old Venetian Renaissance armoury, now proposed to be renovated and used as a museum of antiquities. This building is a very good example of its period. The other Renaissance work in the town is fragmentary, but the Turks largely adopted details of the late Venetian occupation, which causes some confusion. The Gothic work in the town, or rather the "pointed arch" work, is in some cases even more difficult to analyse, as the Turks are always at home with the pointed arch, so that the Venetian Gothic and the Turkish work are not always readily distinguishable. Both of them probably have a Saracenic origin Venetian Gothic is certainly quite a unique flower in architecture, and perhaps belongs properly to the East, as the Turkish work undeniably does. There are one or two charming fragments of Venetian Gothic in the town, enough to show what might have been under a more fortunate dispensation. Here should be mentioned the only Gothic church in the town which is still standing. It is now used as a mosque. It has no pretensions whatever, being merely a barn-like structure, with high, narrow, pointed windows, all perfectly plain. It has a stumpy Turkish minaret of pleasantly original design. This mosque is illustrated in Pashley's "Travels in Crete." The wall fountain in the little square beside this mosque is the only example I know in Candia of Roman work being built into a wall by later hands, which is so commonly seen and so often charmingly effective in Rome and Constantinople. Of Turkish work one of the best old fragments is the series of arches in the main street leading up from the harbour. It much resembles the boat-slips at the harbour, but has one or two tricks of Turkish detail. The Turkish fountains are mostly at the corners of the streets, and, generally speaking, are hardly worth taking note of ; but in one or two cases the simplicity of the mouldings deserve attention. Turkish work, when it redoubles on itself without other influences, has a tendency to over-elaboration, and most of the great show fountains of Constantinople are glorified grottoes in their total effect ; so that it is refreshing to come across some things in this little provincial town which, either from poverty of workmanship or uncertainty of style, are simpler and broader in treatment. In the narrow winding streets one sees Turkish wooden houses with latticed windows, usually with a good projecting cornice and pilasters, and the upper storey projected two or three feet and supported on wood brackets. In the high walls giving access to the forecourts of the stone houses one sees here and there a Renaissance door and window, with occasionally a wall fountain, a trough surmounted by a round-arched niche and accessories being the usual motive. The wood houses are pretty much the same as those in the streets of Stamboul, and remind one a little of English half-timbered work, gables of course being absent, and a thin, matchboardy effect taking the place of the solid oak of the English. I have reserved the mention of the earliest work of all, the Byzantine, till the last; but there is really no definite building in this style that I am aware of existing in Candia. There is not a recent building of any note whatever, except perhaps the Greek cathedral, and not a single mosque which is worth enlarging on. The best mosque in the town is the plain old building mentioned before as the only Gothic church existing; but here, beyond a picturesque, weather-beaten, brick-and-stucco wall, there is nothing to be noted. The modern Greek cathedral is best seen at a distance, and gives additional life to the sea-view of the town. One can pretty well take in the town after a walk through, and appreciate what it is—tawdry, neglected, mediæval Eastern—shortly to become more important, perhaps, through a museum which consists of valuable exhibits with no proper building to hold them; which is part of the fact that many people have ideas about reform in Crete, but as yet very little money or unanimity of opinion have been forthcoming to carry them out.

But, leaving Candia and the burden of Crete meanwhile, let us turn our attention to other parts of the island, and see what is to be found in the way of architecture. And if the result is disappointing, we can remember that archæologically, at least, the ancient evidences are of immense value. The results of Knossos, Praesos, Sortyna, Gnoulas, &c., and the sundry caves of Zeus are giving Crete a research interest quite exceeding expectations. Architecturally, however, it has no town with a strong mediæval interest, like Rhodes, and no body of work such as is disclosed to us in M. Enlart's new book on Cyprus. The results for Crete are in comparison meagre and fragmentary; here and there a small Byzantine church or a picturesque monastery, and for the rest, merely the plain domestic work met with in the country districts of any Eastern land. It is true that there are two other towns of importance on the north coast—Canea and Retimo—Canea being really the modern capital of the island; and I have not examined these towns as I have Candia, but anything really important would naturally be found at the latter place. The growth of Canea is due to the adjacent harbour of Suda, by far the best in Crete. and its prestige is only on the modern side. It is the residential town of the High Commissioner, and, like Retimo, a commercial centre. It would be necessary, therefore, to thoroughly explore the country districts to arrive at a complete knowledge of all the smaller Cretan work. As the architectural bits are so fragmentary, and native evidence so little to be depended on, this would mean a tour of several months' duration. The Italians are said to be working up the architecture of Crete now, but I am not certain how thoroughly for the country districts.

The houses of the Turkish beys are the only ones left to us of any importance. They are usually farm-steadings in themselves, but the houses of retainers are sometimes grouped in a tiny village near. I can briefly illustrate the better class of house by the one I have most acquaintance with—the headquarters of the excavation at Knossos. The front entrance is quite a private one, and leads to the little piazza reserved for the household. The real entrance is at the back, through a courtyard, and leading out of this yard, round which are grouped the stables, is a smaller one descending to the kitchen apartments and entrance to the harem. The *selamlik* looks out to the front, as do the other principal rooms. All have stone wall fountains, which cool the air in summer, and a divan, or at least a platform, round three sides. Glass is a luxury, but hinged wood shutters opening outwards are indispensable. Joined on to the house, beside the little piazza in front, is a large water tank, forming a reservoir for the irrigation of the garden. This tank is not conducive to health in summer time. The house is all whitewashed externally, and is very sensibly plain, with a square parapet to the flat mud or cement roof. The rain water is carried off by channels running down the wall, which in the front of the house are screened by pilasters. The ceilings are of wood; stout exposed rafters carrying boarding. As for the villages, the small out-of-the-way ones have the merest shanties, with rough stone whitewashed walls and flat mud roofs, huddled together in picturesque style. The hill villages in summer are pleasant, as one half lives on the roof. The larger villages have whitewashed houses, the more important ones with courtyards opening off the streets, and sometimes of two storeys, as in Candia Red tiled gabled roofs are also occasionally met with, though they are really modern features.

The next thing to consider is the Byzantine church. This is often in splendid isolation, sometimes on a hill-top, and occasionally even on mountain summits. But every village has its *ecclesia*; at feasts, such as Easter, a very important place indeed. The universal plan is an oblong hall, without a narthex, and with but one feature—the tiny apsidal projection at the east end, finishing semi-dome fashion. In this apse is the only fancy window; in common cases, usually a queer little two-light, with the luxury of a hood-mould. The better class of church has a carved door, or painting in the plastered vault. The wood doors of these churches are sometimes elaborately carved. The usual type is a two-leaved square door, with a rounded centre-post, on which most of the carving is lavished. Many of these wood carvings are so undoubtedly executed in the full tradition of good work, that it is astonishing to find they mostly belong to this century; in some cases being done within the last thirty years. So tradition is dying hard in Crete.

Following naturally from this, of course, is the subject of the monasteries, as they always have chapels attached. The situation of monasteries here, as elsewhere in the Levant, is often very delightful. One rides up a ringing stony pathway to a sense of summit and retirement, and a clean spacious comfort which is a relief to the wayfarer after the squalid village. They are usually more subjects for the sketcher than for the architect in his more practical moods, but the monastery at Arkadhi shows a front of considerable interest, with that quaintness of combined Gothic-Classic influence so instructive often in unhackneyed forms. Unfortunately, I have reason to believe that this is one of the only things of its kind in Crete. The country is not rich in monastery work. These buildings tell by their grouping, but have no particular architectural qualities, strictly speaking.

The second part of this paper, dealing with some Turkish work at Broussa, follows somewhat naturally from the first; as after an examination of the mosques at Constantinople, one feels, as in Crete, the readiness of the Turk to adopt the indigenous architectural forms in the territories of his conquests. The work of the Osmanlis at Broussa, however, is earlier and more representative than any found at Constantinople, and holds an isolated position in Turkish art, somewhat similar to the Cinque-Cento in the history of the Italian Renaissance. The intricacy in the developments of Eastern work is manifold, but in the vast web of Saracenic styles the growth of what might be called the Renaissance of Turkish architecture is at least clear and distinct. The beginnings are to be found in Asia Minor, in those large and suggestive and often very beautiful remains of the Seljouk domination. It may be said that this pointed work of the Seljouks bear most affinity to Persian work, on which, so far as I know, it was directly founded. The work about which I wish to speak begins with the era of the Broussa Sultans, when Mourad, Bayezid and Mohammed—all first of the name—built the chief mosques of Broussa. Founded, as it was, on what the Seljouks had done before, this work seems to have, in addition, some large and common-sense individualities. The typical two-dome plan, which, Texier observes, is not found at Constantinople at all, is best seen here in the Mosque of Mourad II., the Mosque of Bayezid I., and the Green Mosque, or Mosque of Mohammed I. This last and its Turbeh adjoining, are especially notable.

The two-dome plan, in its completeness, has an open porch, or loggia, of the whole width of the entrance front; and this feature can be seen in the Bayezid and Mourad Mosques. The Green Mosque, however, was left incomplete, and the porch was never added. This mosque was built in 1420, and one hardly looks for such big, say Michelangelesque, detail in Anatolia at that time. In exterior disposition the mosque is, uniformly, of two storeys, finished with a cope, over which is a low-pitched roof. At the entrance end are two minarets, originally covered with green faïence, and evidently reconstructed since the earthquake of 1855. The exterior generally is all marble surface, and has exquisite carving at the doorway, windows and niches. The doorway is a particularly fine piece of design, both in proportion and detail. The adjoining Turbeh, or tomb of the founder, is one of the most delicious creations imaginaable. The lower part of the exterior is of white stone, with large panels of bright blue-green tiles. The upper part is painted light green, and is finished with a domical lead roof. It is of large scale.

Other most interesting mosques in Broussa, besides those already mentioned, are the Ulu Jami, or Great Mosque, the Mosque of Emir Sultan, and the Mosque of Mourad I. at Tchekirgeh. The former is a very large building, more like a bazaar than a mosque, and quite dominates the general view of the town. It is of large simple-pointed work, with two tall minarets and a forest of domes. It is finished in stucco, like most of the Constantinople mosques, and this poverty of material contrasts rather unfavourably with the Green Mosque, which is finished with marble both outside and in. Some very good brickwork is also to be seen at Broussa—in the exterior of the Mosque of Emir Sultan, and in the various Turbehs at the Mosque of Mourad II. The type of entrance loggia which was so common here, and which was continued as a feature in the Constantinople mosques, may be well seen from the Mosque of Bayreid I.

In considering the conditions of the problems presented to us by these Turkish buildings, we can learn by seeing the use the builders of them made of their materials to hand *in toto*; that is to say, of conditions of climate and religion, as well as hard matter-of-fact forces of everyday design; and, following from this, by the good old lesson on the justification of apparent eccentricities common in some form or other to every period of architecture. What strikes as boldness in a design, when we come to analyse its constructive meaning, may appear simplicity itself when the effect as it stands is only taken into account, and unworthy of any except admiring notice. For example, stripped of its effects and considered on plan, the corbelling out of the main domes of the Green Mosque on three sides only may appear freakish, but in reality it serves to make one interior of the two domes, especially as softened by the beautiful form of corbelling adopted by the Turks and all Saracen races. The fact, too, in the same building of a higher shrine inferior in cheerfulness to the lower entrance part seems peculiar on the face of it, apart even from any religious motive; but when we see that this effect is balanced by a stately gravity in the design of the entrance wall, and, moreover, is quite reasonable in itself from an æsthetic point of view, we realise a something here which gives a sense of fresh perception, and, as such, is, of course, of the highest value. The sense of strangeness in contemplating Eastern buildings at the first rush is inevitable to us, because the real East is far removed from the West in everything, including such a small thing as the treatment of an interior. The elements of the composition in a mosque interior are the fountain of cold water surrounded by cool and restful colours, and an exquisite diffused light. In the best mosques there is no attempt at strenuousness in anything. The mihrabs, though often marvels of detail, are set as a rich door in a plain wall would be, which means that they draw attention to themselves, but do not detract from the simplicity of the composition as a whole. Naturally, in Eastern countries the smallness of the entire window area necessary for lighting a building adequately vastly affects the conditions of design. It is this, perhaps, that makes he domical construction of these countries so asy, as there is no need to be eternally fussing bout this or that window which interferes with his or that construction. The total effect of ighting in two interiors (one Western and the ther Eastern) may be the same; the former vith its many windows and the latter with its ew. The advantage, however, for purposes of lecoration is distinctly with the East; the wall-spaces are broader and simpler, and the absence of an appearance of lighting forcing itself on one gives greater restfulness to the decorative effects. Thus in a measure the entire question of Eastern decoration must be considered with reference to itself alone. The large use of tiles in decoration is the prevailing characteristic of Persian art and what emanated from it. This makes possible the large spaces of plain colour which are necessary when only borders and spots of pure ornament are used. Hexagonal tiles of an exquisite blue-green, relieved by gem-like touches of pure colour, such as we see in the Green *Turbeh*, are, under the circumstances, perfectly satisfying. It is a question of surroundings and mental attitude to a large extent. Coming from the blinding sun and dusty glare of an Eastern summer into such a perfectly neutral half-light, with its cool marbles and fountains, and its atmosphere of satisfying colour, one feels a sense of the fitness of things. Use and wont and perception of long ago have made the materials which best suit the situation. The practical conclusion of the whole matter is to try and find out how the Moslem has solved the ordinary problems of his building, for naturally he has a certain discount to start with, having Persian tiles, which belong to the world's chiefest treasures of art, at his command. But if there are evidences of thought in their setting—as, I think, will easily be found in such buildings as the Green Mosque at Broussa—we can have scope, after the first burst of admiration, to contemplate wise solutions of problems which come very near to us after all. There is a strange freedom also in the treatment of much of the Turkish work which makes it easy to institute a comparison with modern work. For instance, Mr. Philip Webb's conception of stone detailing seems to me similar to the attitude of the Broussa builders in a like capacity. A strong feeling for material is evident, and a daring reserve in design which is nearly always justified in effect.

Mr. Fyfe then proceeded to explain a number of lantern slides and drawings showing the discoveries made at Knossos under the Cretan Exploration Fund, to which he had been engaged as surveyor. Following Mr Fyfe, Mr. Evans, Keeper of the Ashmolean Museum at Oxford, the director of the excavations, gave some explanation of the drawings and photographs.

The Discussion.

Mr. R. PHENÉ SPIERS, in proposing a vote of thanks to Mr. Fyfe and Mr. Evans, said it seemed strange that in those early days both materials should have been used for building which were either of a most lasting or a most ephemeral nature. But what was most strange of all was that we should find some evidence of the crude unburnt-brick walls.

Mr. A. C. DICKIE, with reference to Mr. Fyfe's remarks about Turkish architecture, said that Saracenic architecture should not be judged by representations on paper.

Mr. BERESFORD PITE, in seconding the vote, thought the word "naturalistic" hardly expressed the character of the Cretan decoration, as it was in addition highly decorative. Mr. Fyfe's description of the Turkish mosques showed how very easy it was to get up an enthusiasm for the commonplaces of architectural design. He questioned whether the Turks had any art at all. Had they any architectural forms which they did not degrade from the great Persian art which they had at their hand?

Mr. WALTER CRANE thought the frescoes discovered clearly showed a blend of Etruscan and Egyptian art.

Mr. A. T. BOLTON thought it would be a great misfortune if any student should be discouraged from investigating Turkish work. All these later Turkish buildings possessed a certain value of their own, for the ideas which the Arabs were carrying out had been partly carried on, such as in domes. Nearly almost all the Turkish architecture was the work of foreigners; he did not think the Turks had any building capacity.

Mr. R. ELSEY SMITH also spoke.

The vote of thanks was then passed by acclamation and replied to by Mr. Evans and Mr. Fyfe.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Working Hours for Architects' Assistants.

CLACTON-ON-SEA.—H. P. writes: "What are the usual business hours (provincial) for architects' assistants?"

From 9.30 to 6.

Mounted Drawings.

NORTHAMPTON.—ENQUIRER writes: "I have some drawings (mounted on strainers) which I wish to hang on a wall, and I should be glad to know how to preserve them from dust and dirt—they are not to be framed or glazed."

It is impossible to keep the drawings free from dust and dirt unless they are covered with glass, varnished, or similarly protected.

Old Lancashire Churches.

SOUTHPORT.—ANXIOUS writes: "Are there any books giving descriptions and the architectural history of the old churches of Lancashire?"

We do not know of any such books. An illustrated article on "Lancashire Church Architecture" was published in our issue for March 28th, 1900, and another on "Ancient Halls of East Lancashire" in our issue for April 25th, 1900. These may perhaps be of use to our correspondent.

Ownership of Perspective.

LONDON.—ANXIOUS writes: "I was recently engaged by an architect to prepare a perspective for a competition. His design was placed first and is now being carried out under his name. Can I submit the perspective to the building papers for publication as a design, bearing my name, not being associated with the name of the architect?"

No. If you expressly did the work for the architect the perspective belongs to him, and you are not at liberty to make use of it in the manner proposed without his consent; it is not probable that he would allow you to publish it as a separate design bearing your name.

County Surveyors in Ireland.

GALWAY.—GALWAY writes: "Is it necessary to possess indentures in order to become an assistant county surveyor in Ireland? What qualifications are necessary? Is there any way of becoming a member of either the Institution of Civil Engineers, the R.I.A.I. or R.I.B.A. other than by serving one's time to a member? What books would you recommend me to study?"

For county surveyors in Ireland, applicants need only "have been engaged upon sufficient works for a sufficient time" to have obtained experience justifying admission to the examination by the Civil Service Commissioners. The production of articles is not essential though useful; and it is just the same with the R.I.A.I. and the R.I.B.A., though in the case of both these bodies, and more particularly in that of the Institution of Civil Engineers, the Secretary should be communicated with and the special circumstances of the case carefully laid before him. With regard to books, we would suggest that our correspondent obtain particulars of the various examinations from official sources, and then consult us again upon such subjects only as he requires information. A full list of books would occupy much space, possibly unnecessarily. G. A. T. M.

Workmen's Compensation.

HARPENDEN.—A. H. S. writes: "(1) Is it advisable to insert a clause in building contracts to the effect that the contractor holds the employer free from all liability in respect of the Employers' Liability Act? (2) In what year was this Act passed?"

(1) Under the Workmen's Compensation Act, Sec. 4, you would be liable for accidents to the sub-contractors' workmen. The sub-contractors are liable to indemnify you; but nevertheless a clause such as you mention might save litigation. (2) The Employers' Liability Act was passed in 1880. The Workmen's Compensation Act, to which apparently you refer, was passed in 1897. A. O. H.

Architects' Charges for Drawings.

SEDGLEY.—F. B. H. writes: "A short time ago I surveyed a public-house for the county magistrates in respect of an appeal. I attended the Quarter Sessions (having previously been served with a subpœna) and was paid the usual professional fees and expenses. I afterwards sent in my account for the plan, &c., for which I charged three guineas. The Clerk returned the account altered to two guineas, enclosing a cheque for that amount. After corresponding with him for some time he said that he had paid me all, in his opinion, the Court would allow. What I wish to know is, have they any right to alter my account; can I claim for the full amount?"

Without further details it is impossible to say what you are entitled to claim. The Clerk, however, would seem to have acted within his rights. A. O. H.

Acoustics of Room.

CANTERBURY.—W. W. writes: "A committee-room has recently been built here the acoustic properties of which appear to be very bad The complaint is that the chairman speaking at one end cannot be heard at the other, owing to reveberation. Some suggest placing wires across the room. Would this cure the defect? The room measures 38ft. by 25ft., and is 13ft. 6in. from floor to collar beam."

Wires are considered to "damp" the sound waves so that the echoing or vibration of the air when speaking is reduced. They would be placed at the top of the vertical walls and about 5ft. apart, say, from wall plate to wall plate, but the writer has no personal experience of their efficiency. A curtain draped on the wall at the back of the speaker sometimes has the same effect. Modulating the pitch of the voice and the rate of utterance to suit the room is important in all cases, and a difficulty in hearing is often due more to the speaker than to the surroundings.

HENRY ADAMS.

Cubing Contents of House.

PLYMOUTH—DELABOLE writes: "Which is the proper way to ascertain the cubical contents of a dwelling-house of the following dimensions:—Frontage, 35ft.; depth, 30ft.; average depth of wall below damp-course, 3ft. 6in.; damp-course to eaves, 21ft. Both ends are gabled."

The way to cube up a house for approximate cost is to multiply the length by the breadth and by the height from the bottom of the footings to half-way up the slope of the roof. In the case given it will be $35 \times 30 \times 29.5 = 30{,}975$, which at 6d. per foot cube would amount to say £775. The rate will vary from 4½d. per foot cube for speculative building of the slightest character to 7d. for ordinary dwelling-houses, 9d. for substantial buildings, and 12d. or 15d. for first-class work under an architect.

HENRY ADAMS.

Making Connections with Public Sewers.

HIGHAM FERRERS—B. S. writes: "The land on the south-east side of a private road leading to a railway station has just been sold for building purposes in plots, and the plans of a pair of houses to be erected there have been passed by the rural district council, their surveyor adding the following words to the letter in which the plans were approved:—'and you can also connect your drain with the

Station Road sewer, by and with the consent of the —— Railway Company *to open up* the road to it.' (1) Is it necessary to apply for such consent, seeing that the council have the power to repair and make connections, and that all the houses on the north-west side are drained into the sewer? (2) Can the railway company legally withhold their consent provided traffic is not stopped and the road surface is restored to its original state of repair?"

(1) As a matter of ordinary courtesy—if for no other reason—the railway company should be informed of your intention to make a connection to the public sewer, and their formal consent obtained, seeing that it involves breaking up a portion of their private road. (2) So far as can be ascertained from the general statement submitted, and taking into consideration the provisions of the Public Health Acts, it is considered that the railway company would have no legal grounds for withholding their consent. T. E. C.

Builders' Notes.

The Association of Master Painters in Scotland held its annual meeting in Edinburgh recently, when Mr. Alex. Latto, Aberdeen, was appointed President of the Association for the ensuing year, Mr. John Scott, Glasgow, Vice-President, and Mr. W. B. Crawford, Glasgow, reinstated as Secretary.

Mr. P. M. Henry has introduced into his brick and tile factory at Ballydrum, Swinford, co. Mayo, machinery capable of producing from 6,000 to 10,000 solid or perforated bricks per day, which should prove a considerable boon to Irish contractors and others and will enable him to execute orders with greater promptitude than heretofore.

Mr. John Hatch, of Fenton Street, Lancaster, died recently in his 72nd year. Deceased assisted in the business of Messrs. Hatch and Sons, contractors, joiners and builders. He was formerly secretary of the Freemasons' Lodge, and was a past secretary of the Lancaster Master Builders' Association.

Messrs. Frederick Walton and Co., Limited manufacturers and patentees of Lincrusta-Walton and Caméoid, inform us that, owing to the termination of their engagement with Mr. F. E. Hine, the management of their London office and showrooms will in future be under the personal control of Mr. Alfred J. Nicholson, who has acted for some years as managing director to the company.

Mr. James Charles Gaskin, of Victoria Road, Wincheap, Canterbury, died recently. Deceased for many years carried on an extensive business as builder, painter and plumber in Canterbury, first in partnership with the late Mr. R. Godden and subsequently alone. He built and restored many of the buildings belonging to the Dean and Chapter and many churches and schools in Canterbury and other parts of East Kent.

The Sheffield Master Builders' Association held its annual meeting last week, Mr. James Longden, president, being in the chair. Mr. Longden having accepted the presidency of the Yorkshire Federation of the Building Trades, Mr. J. Biggin was elected president of the Sheffield Association. Mr. A. J. Forsdike was appointed vice-president, Mr. A. Mastin treasurer, and Mr. W. J. Spink secretary. The president, vice-president, and Messrs. A. Mastin, T. Roper and M. Grantham were elected representatives to the Yorkshire Federation

The Midland Centre of the National Federation of Master Builders held its annual meeting recently at Birmingham, when in the place of the retiring president (Mr. Jas. Wright, Nottingham) Mr. Arthur Chambers (Leicester) was elected, and the other officers for the ensuing year are: Vice-presidents, Messrs. William Sapcote (Birmingham) and J. Sharman Wood (Worcester); treasurer, Mr. H. Willcock (Wolverhampton); auditors, Messrs. J. V. Porter (Derby) and F. G. Whittall.

The Wakefield and District Master Builders' Association held its annual meeting recently. At the commencement of the proceedings, Mr. Elvey, the retiring president, occupied the chair. Councillor W. Judge was unanimously elected president for the coming year. Mr. Elvey was elected senior vice-president and the meeting also elected Councillors Denholm and Driver, and Mr. G. Crook as additional vice-presidents. The following were elected as the committee:—Messrs. C. S. Denison, H. Fallas. J. B. Hesling, J. Pashley, G. Wilson, H. Blackburn, J. E. Bramald, J. Johnson, J. Lazenby, W. H. Moss, J. Woodhead, G. W. Sanderson, M. E. Rycroft and G. R. Parker. Mr. Elvey was also elected the representative of the Association on the committee in connection with the Yorkshire Federation of Employers—Mr. G. Beamont was re-elected secretary. The balance sheet (which had been audited by Messrs. J. E. Bramald and J. Pashley) showed a balance in hand of £10 17s. 8½d.

London County Council.—At last week's meeting of the Council the Chairman announced that a letter had been received from Mr. Horniman offering to the people of London on behalf of his father, Mr. Horniman, M.P., about fifteen acres of freehold land at Forest Hill, together with the museum which has just been erected at the cost of about £40,000. In it are placed the large art and natural history collections gathered by Mr. Horniman during the last twenty-five years. The offer was accepted. The Highways Committee recommended the acceptance of the estimate of £7,900 for the construction of new tramways in Crowndale Road, Agincourt Road and Constantine Road, in the district of St. Pancras. The recommendation was adopted. The Water and Public Health Committees brought up their joint report in reference to the proposed amended regulations of the London water companies. The recommendations of this report, which are mainly in the direction of condemning the proposed regulations, were submitted on the previous day to a conference of the local authorities of the metropolis (see p. 25 of this issue). The recommendation to oppose the regulation as to cisterns with a view to its being struck out was carried by 99 votes to 4. A resolution was adopted in favour of subways under the leading thoroughfares to contain all gas and water pipes and telegraph and telephone wires.

The Builders' Foremen's Association held its seventh annual dinner at the Holborn Restaurant on Saturday last. More than 150 sat down to dinner, under the chairmanship of Mr. Henry Hibberd. After the toast of "The King and the Royal Family" had been honoured by the singing of "God Save the King," the chairman proposed briefly "Success to the Builders' Foremen's Association." In responding to this toast Mr. E. C. Akermann, the president of the Association, explained its objects. The Association had been in existence for eight years, and the membership was steadily growing. It was of the nature of a self-help association whereby members in difficulties or out of employment were assisted by their fellow-members. But it did not neglect the educational and social elements, lectures, outings, and smoking concerts being held from time to time. Recently also a scheme of insurance had been introduced by which on the death of any member his relatives were entitled to a sum of money. The president paid a well-deserved tribute to the secretary, Mr. W. Cook, to whose enterprise and untiring energy he attributed the success of the Association. Mr. Cook's name was also coupled with the toast and his health was drunk with musical honours. The toast of "The Building Trades" was proposed by Mr. G. H. Webster, who in the course of his remarks referred to the opinion held by many employers—a just opinion he considered—that foremen could not in fairness to their employers or to themselves belong to any trades union, and it was then that an association such as the Builders' Foremen's Association was of benefit. It remained to be seen whether employers in London would imitate the action of employers in the north by offering foremen inducements to retire from the trades unions. He further stated that merchants could ease the troubles of the foremen very much if they studied the order in which materials should be supplied and sent them quickly. His experience was that materials required last came first, and the first last. In responding to this toast Mr. Mackenzie said he considered that the men of our country to-day showed themselves to be worthy successors of the ancient nations who taught us how to build. Other toasts duly honoured during the evening were "The Visitors" and "The Chairman." An excellent programme of vocal and instrumental music was interlarded with the speeches and a thoroughly pleasant evening was spent. The address of Mr. W. Cook, the secretary of the Association, is 10 Manor Park Road, East Finchley.

Surveying and Sanitary Notes.

A new Park for Tottenham is to be purchased by the Tottenham District Council for a public recreation ground. The site selected is part of the estate known as "Down Hills," and consists of a mansion, its grounds, and three large fields. The whole comprises nearly 30 acres.

Sanitary Inspectors.—Miss Marie Stewart, 24, of London, has been appointed by the Leeds Corporation a sanitary inspector for the city. The lady succeeds in the office Miss Hobson, who has resigned. The new inspector was educated at Girton, and has been studying medicine. The post was sought for by about a dozen ladies. The following is a list of the candidates who passed in the recent examination for Sanitary Inspectors:—Miss G. D. Bevan, Miss I. W. Cox, Mr. V. E. F. Donnewald, Mr. A. Griffiths, Mr. R. E. James, Miss G. A. Looker. Mr. C. W. Rudd, Miss L. L. Spiller, Mr. A. H. Walker, and Mr. A. Wheaton.

Sewage Disposal at Waddesdon and Haddenham.—A Local Government Board inquiry was held at Waddesdon by Mr. F. H. Tulloch, M.I.C.E., into a petition presented by the Aylesbury Rural District Council for power to put in force, with reference to certain lands required by them for purposes of sewage disposal for the township of Waddesdon, the Land Clauses Act, with respect to the purchase and taking of lands otherwise than by agreement. The land in question was about three acres of glebe adjoining the Quainton Road, of which the Rev. Dr. Yule, as rector, is the life owner. Mr. Guest Luckett, Engineer to the Council, was present, and explained the scheme to the inspector. On the following day a similar inquiry was held at Haddenham by the same inspector. Mr. G. Luckett on this occasion was also present as engineer of the scheme, and explained the plans. In both cases there was considerable opposition.

Masters and Men.

The Northern Bricklayers' Dispute.—A meeting of the employers in the building trade was held at Newcastle last week to consider the bricklayers' prolonged dispute and the proposed arbitration proceedings. It was intimated that an agreement had been come to with the operatives that the Board of Trade should appoint an arbitrator, and that such would shortly be appointed. The Arbitration Court is expected to meet at an early date; the men, however, do not return to work until after its sitting.

Bricklayers' Strike at Brentford.—During the past three or four weeks a bricklayers' strike has been in progress in Brentford. It arose out of the usual question of wages, and the firm affected is Messrs. Dorey and Co. It appears that the bricklayers employed by this firm gave a six months' notice that they would go out on strike if they did not receive an extra ½d. per hour pay. The six months elapsed but there was no sign of an increase, so the men allowed another two weeks to go by without any result. The bricklayers employed by the firm number upwards of 100. Messrs. Dorey have been able to fill the vacancies. The men out on strike are members of the Bricklayers' and General Labourers' Union, and are hopeful of getting the increase they asked, and also re-employment. The labourers also gave notice some time ago that they would strike if they did not get an increase in wages. The time given, however, has not yet expired, but the desired increase in their pay has not been given.

New Patents.

These patents are open to opposition until March 16th

1900. — Wrought-iron Girders.—20,245. C. HESSEL, 59 Neue Winterfelderstrasse, and W. SIPPEL, 88 Kopnickerstrasse; both of Berlin. The beam is formed with large oblong perforations in the web, which is thicker than usual. The weight of the beam is thus reduced and its cost is less. The feature of the invention is that the beam leaves the rolling mill quite finished and ready for use.

Wall and Ceiling Decorations. — 22,177. D. M. SUTHERLAND, Westholme, Sunbury Common, Middlesex. The object of this invention is to produce an embossed fabric of great flexibility with a non-absorbent surface not needing to be sized either before or after being hung. This is accomplished by taking a sheet of paper or asbestos and passing it through a pair of calendar rolls so as to apply a very thin coating of waterproof composition in any desired colour. This is allowed to set and the paper is then embossed in the usual manner by a rotary embossing machine.'

Partitions.—22,303. E H. BELL, 40 Lisle Street, London. The special plastic material of which the partitions are composed is made as follows:—About 40 parts of good brickmaker's clay is mixed with about 60 parts of infusorial earth, the whole being made plastic with a 10 per cent. solution of calcium chloride, to which 10 per cent. of sulphate of magnesia is added. With this plastic material may be incorporated a suitable quantity of asbestos waste and of wood wool. The latter is burnt out subsequently, leaving innumerable small channels in the material, thus making it extremely light and porous.

The following specifications were published on Saturday last, and are open to opposition until March 23rd. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—1,310, SAYERS, elevators. 2,656, SCHOTT, pumping apparatus for slip and glazes used in the manufacture of pottery. 2,709, LEROY, gas generators. 3,413, STEVEN AND COLQUHOUN, construction of kitchen ranges. 3,555, TAIG, TAIG, TAIG AND ROBERTSON, means for lighting street and other gas-lamps. 3,773, JONES AND JONES, chimneys and stoves. 3 994, AITON, pipe joints. 4,722, WEBSTER AND THORNTON, measuring rules. 4,790, PRESTON AND JAKEMAN, manholes and manhole covers. 4,812, POTTER, forming wood floors. 5,098, HALL AND BOARDMAN, LTD., AND HALL, manufacture of bricks. 5,297, DRENCKHAHN AND SUDHOP, manufacture of cement pipes. 5,417, WOODHOUSE, syphon-discharge flushing cisterns. 5 922, LESSING AND RHEINFELD, process for burning cement, gypsum, &c. 6,361, BRAY, construction of gas burners. 9,443, EDWARDS AND EDWARDS, pulleys. 9,658, FRASER AND CHALMERS, LIMITED (*Stumpf*), pumps. 13,139, HOOK, lighting and extinguishing of street and other gas lamps at pre-determined times. 13,248, REEKIE, plugs for drain and other pipes. 16,731, ULLRICH, chimney top. 18,457, KIELBERG, manufacture of pipes of cement or similar material. 18,653, STEVENS, fastening devices for window sashes. 19,267, SCHEELE, incandescent gas burners. 20,356, FOLEY, roofing tiles. 20,725, LAKE (*Worstall & Hackathorn*), manufacture of varnish. 22,311, MOORE, doors or gates. 22,404, CROPPI and EDANT, apparatus for flushing water-closets. 22,491, CARPENTER, incandescent gas burners. 22,492, CARPENTER, apparatus for fitting pegs to incandescent gas burners. 22,564, AITKEN, rotary pump for air, water, etc. 22,821, SIDEBOTTOM, circular fan for ventilation. 23,027, CARPENTER, igniting of incandescent gas burners.

Keystones.

The Architectural Association of Ireland held a meeting last week, when a resolution of condolence with the King and the Royal Family on the death of the Queen was adopted, being proposed by Mr. R. M. Butler and seconded by Mr. F. G. Hicks. Mr. P. J. O'Reilly then delivered a lecture on the Mont St. Michael in Normandy.

Frescoes at the Royal Exchange.—An offer has been made by Mr. Alderman and Sheriff Vaughan Morgan and Mr. Sheriff Lawrence to contribute a panel painting to the ambulatory of the Royal Exchange in commemoration of the recent proclamation of the King on the steps of that building. The offer will, no doubt, receive the most grateful consideration of the Gresham Committee, the members of which decide all questions respecting the decoration and management of the Royal Exchange.

Mr. John Murray Robertson, F.R.I.B.A., architect, of Albert Square, Dundee, died at Crossmount, Perth, on January 31st. Mr. Robertson was born at East Mains, Strathord, Perthshire, in 1844. At the age of sixteen he entered the office of the late Mr. Andrew Heiton, architect, Perth. For the last twenty-five years he was closely identified with Dundee. His special line in architecture was the Queen Anne style. He was the architect of the Royal Victoria Hospital and the Caird Hospital for Women, Dundee; the Lochee Baths and Free Library, and of many of the most prominent mansions in Forfarshire and Perthshire, Balboughty House, near Perth, being a good type of his work. In Perth he was architect-in-chief to the Messrs. Pullar, and designed the Consumptive Hospital for Perth, which is not yet completed.

Cardiff's New Asylum.—Out of a large number of plans sent in for a new asylum for Cardiff, Mr. George T. Hine, the professional assessor and advisor to the Commissioners in Lunacy, selected six for the second stage of the competition. One was, however, paid out, because it was discovered that he was in the employ of Mr. Hine, who, it should be mentioned, was not aware that he had sent in plans, the names not being submitted to him. Mr. Hine has now reported upon the remaining five plans, and declares the best set of plans to be those sent in by Messrs. G. H. Oatley and W. S. Skinner, Edinburgh Chambers, Bristol. The premium of £500 will merge into the architects' commission, which has been fixed at 5 per cent. on the cost of the building. The following architects get £100 each to compensate them for their time and trouble:—Messrs. Law and Allen, Arundel Street, London; Messrs. Greenaway and Newbury, Queen Anne's Gate, London; Messrs. Hooley and Sanders, Nottingham; and Messrs. Wills and Anderson, Swansea.

The Ruskin Union held its first annual meeting last week, Mr. J. A. Hobson presiding. The report, which was adopted, stated that the union—inaugurated on February 8th, 1900, the 81st anniversary of Ruskin's birth—numbered at the close of the year 219, of which number 23 were corporate members with 29 elected representatives. The corporate members consisted of Ruskin societies having a large membership in several of the chief towns of the United Kingdom. The council had appointed a memorial committee with power to collect funds for the raising of a national memorial to Mr. Ruskin, and a special committee had been appointed to consider a resolution that, as a Ruskin memorial, the house and grounds formerly occupied by John Ruskin at Herne Hill should be acquired, a settlement formed there, with collections of natural history and art, with a suitable library. Further, that an effort might be made to place a statue or portrait of John Ruskin in the Turner room of the National Gallery. The members of the council were elected, amongst them the Bishop of Durham, Lord Windsor, Sir Walter Parratt, Sir J. D. Linton, the Warden of Keble, Sir Henry Harben, Sir F. Seymour Haden, Mr. T. Burt, M.P., Bishop Barry, Professor Attwell, and Mr. R. A. Allison, M.P. A lecture on "Ruskin and Literature" was afterwards delivered by Mr. R. Warwick Bond.

A Roman Catholic Church is to be erected at Moor Lane, Ashton-in-Makerfield.

The Glasgow Technical College.—The fund being raised for the erection of new buildings for this college has now reached £71,531.

A new Theatre at Folkestone is to be erected at a cost of £20,000 by the Folkestone Pleasure Gardens Company, and the old theatre will be adapted to winter garden purposes.

A Stained-glass Window has been placed on the east side of Wesley's Chapel, City Road, as a memorial to the late Mr. W. Willmer Pocock, B.A., the well-known architect of the Metropolitan Tabernacle.

Mr. F. B. Howarth, architect and surveyor, has opened an office at Bilston, Staffs., the address of which will be the Town Hall Chambers. The office at The Firs, Sedgley, near Dudley, will also be kept on.

The Design for New Baths at Swinton, submitted by Mr. T. J. Bushell, architect, of Manchester, at a cost of £4,725, have been recommended for acceptance by the Swinton and Pendlebury Urban District Council.

The Plans for the Connaught Theatre, Tottenham, which will have a seating capacity of 2,000, have been passed by the Middlesex County Council. The architects are Messrs. Owen and Ward, of Birmingham. Building operations will be commenced early in March in order to open the theatre on Boxing Day.

A New House of Parliament is to be erected in Western Australia. A sum of £100 000 is to be set aside for the work, and £500 is to be spent on a design, this being offered to the architect whose plans meet the sanction of the authorities at Perth. It is noteworthy that designs are not invited from architects outside Australia.

A Memorial to John Ruskin was unveiled last week, on the anniversary of his birth. The memorial is a beautiful mural tablet in St. Paul's Church, at Herne Hill, executed in coloured marble, surmounted by a white medallion of Ruskin, from a design by Mr. Brindley, advised by Sir William Richmond and Mr. Arthur Severn, Ruskin's relative. Mr. Holman Hunt unveiled the tablet.

Chichester Cathedral.—A legacy of £500 left by the late Mr. J. F. France is to be devoted to the restoration and repair of the west porch and entrance to the cathedral. The western entrance is flanked by two towers, one of which has just been rebuilt, and is considerably below the surrounding level, while it is overshadowed by trees. Even in the middle of summer the entrance strikes one as cold and damp, and, like so many other portions of the nave, it sadly needs repair.

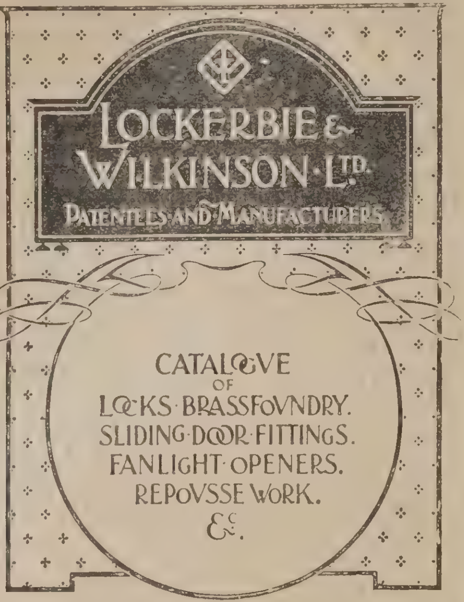
"Modern Opera Houses and Theatres," the monumental work by Mr. Edwin O. Sachs, is to be reissued by Mr. B. T. Batsford in the spring. Mr. Sachs' work comprises three grand folio volumes with 220 plates and over 1,000 illustrations; and the first edition appeared 1896 to 1898, after having required over eight years' preparation. The work is by far the most comprehensive on any special architectural subject published during the past century. The new issue will be in no wise inferior to the original, and will contain a special prefatory note dealing with the latest developments and improvements in theatre architecture which Mr. Sachs has to such a great extent been instrumental in bringing about, not only at home, but in foreign countries.

London Street Architecture.—The building, No. 27 High Street, Kensington, illustrated on page 19 of this issue, was erected about three years ago from designs by Professor Banister Fletcher and Son, architects, and comprises shop premises with residential chambers over. The front is faced with red bricks relieved with stone dressings. The bay window is entirely of stone, with a brick parapet surmounted by a flush stone coping. The woodwork is painted green, which forms a pleasant contrast to the yellow stonework and red facings. The side walls to the balconies have painted tile panels, representing four great composers—Mendelssohn, Mozart, Handel and Bach. Our drawing is by Mr. Sydney Newcombe. Other illustrations of this series will be found in the issues for October 17th and December 5th, 1900.

Trade and Craft.

Lockerbie and Wilkinson's New Catalogue.

Messrs. Lockerbie and Wilkinson, Limited. are now issuing a new catalogue, which is very complete and excellently produced. The firm, who have their warehouses and head offices at Birmingham, their works at Tipton, Staffordshire, and their London office at 109 Victoria Street, S.W., have illustrated a large collection of artistic patterns in brassfoundry, repoussé work, &c., the reasonable prices of which should commend them to the attention of the increasing number of architects who are anxious to obtain fittings of good design at reasonable prices. Many interesting specialities are also shown, notably the firm's tubular ball-bearing door runners for sliding doors and folding partitions. The increasing use of the latter in schools makes these special fittings a welcome addition to those already on the market. Running on ball bearings throughout, the partition can be opened and closed with the greatest ease, and inasmuch as it has a bearing at the head only, instead of at the sill, its working is not dependent on the evenness of the floor; this has special significance when the partition is being erected in a building where the floors have become uneven through wear. The fittings are inexpensive, and can be very easily applied. Another prominent feature of the catalogue is the elaborate way in which the numerous fanlight and lantern-light stays and gearing are illustrated. It is often so difficult to understand from illustrations how gearing works that any simplification of an architect's labours in choosing an opener is welcome. The catalogue is bound in green cloth of a pleasing colour, and has a striking design on the cover (which is reproduced above). Any architect who does not receive one in the ordinary course of distribution should certainly apply for a copy.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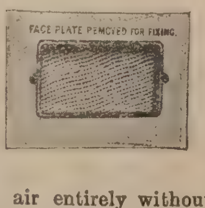
&c.

The "Offa" Ventilator.

The "Offa" ventilator, illustrated below, is intended to be fixed as an inlet, to any apartment or vehicle between 1ft. 6in. and 5ft. from the floor. It is claimed that the opening of windows is no longer necessary where it is in use, that it is noiseless, and that it admits a controllable quantity of air entirely without draught. It is simple and inexpensive in construction, consisting of a frame for building into the wall, carrying an effective air-strainer which is easily removed from the inside when dirty. The frame has sockets in which slide pins carrying a face-plate, which may be drawn out to any required distance or pushed in flush with the wall to close the opening. By an ingenious arrangement the face-plate is prevented from being completely withdrawn—unless it is desired to remove it for cleaning—by stops which are disengaged by a single movement of the handle. There are no loose parts to rattle or screws requiring tools, and every part is easily accessible from the inside for cleaning purposes. The air on entering from outside, after passing the filtering screen, strikes the face-plate and is immediately dflected in every direction, except forward—in fact is compelled to *soak* into the room, causing no draught. In the event of a strong wind blowing on the outside, an exhausting action is set up, the ordinary inlet action being resumed during lulls. The ventilator has been well tested in various places, and it has been found unnecessary to provide any special outlets for foul air where the "Offa" is in use. In 1895 one of the bakeries at Messrs. Huntley and Palmer's factory at Reading was fitted with several of these ventilators. The original working temperature of the building was 120degs. Fahr. with three large fans in action, causing a strong draught to enter at every opening. On the introduction of the "Offa" ventilators an immediate lowering of the temperature to 60degs. Fahr. took place, there were no draughts, and the fans were stopped and finally done away with. The men work within 3ft. of the ventilators and are comfortable. For hospital work it should prove valuable, because it cannot be tampered with by patients, it can be fixed close to the beds, and, if sterilising screens be used, any particular ward or room can be isolated with ease. The screens can be changed once a week, if desired, at a cost of less than 1s. per bed per annum. The "Offa" ventilators are made for building purposes in five sizes, from a 10in. by 7in. face-plate to one 21in. by 18in.; they are sent out packed complete with all screws required for fixing, and can be obtained in plain polished brass, repoussé copper, or enamelled cast-iron. If it is necessary to conceal them, a picture may be hung in front without affecting their efficiency. Smaller sizes are made for use in vehicles and ships. The makers are the "Offa" Ventilating Company, 64 Basinghall Street, E.C.



New Companies.

Springfield Colliery, Limited.

Registered December 31st, 1900, to carry on the business of colliery proprietors, brick, tile, pipe, and earthenware manufacturers, &c. Capital £3,000 in £1 shares. Registered office: Albion Chambers, King Street, Nottingham.

North London Estates Company, Limited.

Registered December 31st, 1900, to acquire land at Wood Green, and to carry on the business of builders, contractors, &c. Capital £2,000 in £1 shares. Registered office 62 Lower Redland Road, Bristol.

Wood Mosaic Syndicate, Limited.

Registered December 31st, 1900, to acquire patent No. 22,547 of 1896, for the manufacture of mosaic work in wood, to be used for flooring, panels, insertions and inlays. Capital £9,000 in £1 shares. The first directors are G. A. Skelton and J. Ralph. Registered office: 112 Edmund Street, Birmingham.

J. Cameron Swan and Partners, Limited.

Registered December 31st, 1900, to adopt an agreement with J. C. Swan for the acquisition of the business of cement manufacturers and brickmakers carried on at Jarrow, Durham, as J. Cameron Swan and Partners. Capital £35,000 in £1 shares. Registered office: The Cement Works, Jarrow Quay Corner, Jarrow-on-Tyne.

Enfield and District Freehold Land Co., Ltd.

Registered December 31st, 1900. Capital £30,000 in £5 shares (3,000 preference). Registered office: 30 Budge Row, Cannon Street, E.C.

Norbiton Potteries and Brickworks, Limited.

Registered January 25th, 1901. Capital £10,000 in £1 shares. W. Johnson is permanent governing director. Registered office: Blagdon Road, New Malden, Surrey.

Brickworks Construction Company, Limited.

Registered December 31st, 1900. Capital £30,000 in £1 shares. The first directors are T. B. Grierson, J. Spencer, J. M. Smith and W. H. P. Henry.

The Dalziel Bridge and Roof Building Co., Ltd.

Registed in Scotland to carry on the business of iron and steel roof and bridge builders, &c. Registered office: 4 Clyde Street, Motherwell. Capital £30,000 in £1 shares.

Vineyards Brickworks Company, Limited.

Registered December 31st, 1900, to carry on the business of a land, building, advance, and investment company; also of brick makers, potters, sand and lime merchants, &c. Capital £5,000 in £10 shares.

Estates Combine, Limited.

Registered December 31st, 1900, to carry on the business of financiers, builders, &c. Capital £5,000 in £1 shares. The first directors are W. J. Bennett and G. Russell. Registered office: 112–113 Temple Chambers, Temple Avenue, E.C.

Concordia Harbour and Docks Syndicate, Ltd.

Registered December 31st, 1900, with 20 members each liable for £1, to acquire a concession granting the right to build a port on the Rio Uruguay, and to carry on the business of harbour, railway, and general contractors, &c. Registered office: 122 Victoria Street, S.W.

South AfricanPortland Cement Syndicate, Ltd

Registered December 31st, 1900, to carry on the business of Portland and other cement, lime, plaster and artificial stone manufacturers, &c. Capital £2,500 in £50 shares.

John Fletcher, Limited.

Registered December 31st, 1900, to acquire the business now carried on at Carnarvon by the Slate Syndicate, Limited, and to carry on the business of manufacturers of and dealers in marble, granite, stone, slate, bricks, tiles, &c. Capital £5,000 in £5 shares. The first directors are D. T. Edwards, J. Fletcher and T. J. Hughes. Registered office: Victoria Docks, Carnarvon.

COMING EVENTS.

Wednesday, February 13.

Institution of Civil Engineers.—Students' visit to the Engineering Models at the Victoria and Albert Museum, South Kensington, at 2.30 p.m.

Edinburgh Architectural Society.—Mr. William A. Agnew on "Electric Power in Buildings," at 8 p.m.

Institute of Sanitary Engineers.—Meetings of Examination and Literary Committee at 3 p.m.; General Purposes and Finance Committee at 4 p.m.; Election Committee at 5.15 p.m., and Members' Sessional Meeting at 7 p.m.

Sanitary Institute.—Mr. Thomas Blashill on "The State of Our Streets," at 8 p.m. Lectures and Demonstrations for Sanitary Officers: Part I. Inspection and Demonstration at Lambeth Disinfecting Station, Wanless Road, Loughborough Junction, at 3 p.m.

Thursday, February 14.

Sheffield Society of Architects and Surveyors.—Mr. H. H. Statham, F.R.I.B.A., on "Our Cathedral Fronts: A Comparative Criticism."

Sanitary Institute – Lectures and Demonstrations for Sanitary Officers: Part I.—Mr. J. Priestley, B.A., M.D., on "Sanitary Law," 7 p.m.

Institute of Electrical Engineers.—Adjourned discussion on Mr. W. M. Mordey's paper on "Capacity in Alternate Current Working," at 8 p.m.

London Institution. — Professor A. C. Haddon, D.Sc., F.R.S., on "The Decorative Art of Primitive Peoples," 6 p.m.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
	BUILDING.		
Feb. 15	Ashford, Middlesex—Two Board Schools	School Board	Fleetwood, Son and Eversdon, 3 New Court, Lincoln's Inn, W.C.
„ 15	Bingley, Scotland—Shop, &c.	Industrial Co-operative Society	W. R. Nunns, Architect, Market Street, Bingley.
„ 15	Smallbridge, Rochdale—House	B. E. Sugden	B. E. Sugden, 333 Smallbridge, Rochdale.
„ 15	Salisbury—Masonic Hall	—	A. C. Bothams, 32 Chipper Lane, Salisbury.
„ 16	Hampsthwaite, Harrogate—Church Restoration	—	The Vicarage, Hampsthwaite Church, near Harrogate.
„ 16	Kippax, near Leeds—Latrines	School Board	Bromet and Thornam, Architects, Tadcaster.
„ 16	Cheltenham—Caretaker's House, &c	—	Borough Surveyor, Municipal Offices, Cheltenham.
„ 16	Annfield Plain, Durham—Shops, &c.	Industrial Co-operative Society	G. T. Wilson, 121 Durham Road, Blackhill.
„ 18	Darenth, near Dartford—Annexes, &c.	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.
„ 18	Kington—Infirmary at Workhouse	Union Guardians	C. S. Delfosse, Architect, Duke Street, Kington, Herefordshire.
„ 18	Upper Witton, Staffs—Smallpox Hospital, &c.	Aston Manor Urban District Council	G. H. Jack, Engineer, Council House, Aston Manor.
„ 18	Middlesbrough—Concrete Walls	Football and Athletic Committee	J. Robson, Hinton's Buildings, Albert Road, Middlesbrough.
„ 18	Canterbury—Extension of Electricity Works	Lighting Committee	City Surveyor, Tudor Chambers, High Street, Canterbury.
„ 19	Todmorden—Board Room, &c.	Guardians	J. Horsfall, Burnley Road, Todmorden.
„ 19	London, E.C.—Alterations to Roof	Shoreditch Borough Council	J. R. Dixon, Borough Engineer, Town Hall, Old Street, E.C.
„ 19	Kingston-upon-Hull—Erection of School Buildings	School Board	Brodrick, Lowther and Walker, Lowgate Hill, Kingston-upon-Hull.
„ 20	Lerwick—School	School Board	R. D. Gansen, Clerk, School Board Offices, Lerwick.
„ 20	Blairgowrie, Scotland—Church	—	D. and J. R. M'Millan, 211 Union Street, Aberdeen.
„ 20	Edgware, Middlesex—Wards	Hendon Union	F. J. Seabrook, Clerk, Union Offices, Edgware.
„ 20	Stowlangtoft—Two Pairs of Brick Cottages	—	J. Birmingham, Estate Office, Stowlangtoft.
„ 20	Barnstaple—Twelve Dwelling Houses	—	W. C. Oliver, Architect, Barnstaple.
„ 21	Londonderry—Reseating, &c.	—	M. A. Robinson, Richmond Street, Londonderry.
„ 21	Rainhill, Lancs.—Piggeries	Asylums Board	J. Gornall, Clerk, Rainhill.
„ 21	Liscard, Wallasey—Car Sheds, Stores, &c.	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
„ 21	Liscard, Wallasey—Engine and Pump House	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
„ 21	Devonport—Alterations	Town Council	Borough Surveyor, 30 Ker Street, Devonport.
„ 21	Fernhurst—Infant Schoolroom	School Board	J. Hill, The Cross, Fernhurst.
„ 22	Armagh—Premises	—	H. C. Parkinson, 11 College Street, Armagh.
„ 22	Walthamstow—Underground Convenience	Urban District Council	G. W. Holmes, Engineer, Town Hall, Walthamstow.
„ 22	New Wortley—Classrooms, &c.	Zion Sunday School Trustees	H. Banister, Hawthorne Terrace, Hull Lane, New Wortley.
„ 22	Abercarn, Mon.—Classroom, Lobby	Mynyddislwyn School Board	R. L. Roberts, Architect, Abercarn.
„ 23	Llwyncwtta, Rhayader—Dwelling House	—	J. H. Price, Llwyncwtta, Rhayader.
„ 25	Camborne—Residence	—	S. Hill, Architect, Green Lane, Redruth.
„ 26	London—Fire Brigade Station	County Council	Architect's Department, 3 Warwick Street, Charing Cross, S.W.
„ 26	London, W.C.—Working-class Dwellings	County Council	Architect's Department, 18 Pall Mall East, S.W.
„ 27	Bristol—Culvert	Corporation	T. H. Yabbicom, 63 Queen Square, Bristol.
„ 27	Minster—Laundry Buildings	Isle of Thanet Union Guardians	L. Grant, Architect, High Street, Sittingbourne.
„ 28	Sheffield—Infirmary Block	Sheffield Union	Union Offices, West Bar, Sheffield.
„ 28	Dublin—Lime, &c.	—	Barrack Master, Irish Constabulary Depôt, Phœnix Park, Dublin.
„ 28	Fir Vale, Sheffield—Workhouse Administrative Block	Sheffield Union Guardians	A. E. Booker, Clerk, Union Offices, West Bar, Sheffield
„ 28	Wrexham—School Buildings	County School Governors	J. H. Phillips, Clive Chambers, Windsor Place, Cardiff.
„ 28	Walthamstow—Four Shops and Business Premises	Parochial Charities	W. A. Longmore, Bridge Chambers, Hoe Street, Walthamstow.
„ 28	Bradford—Wesleyan Chapel	—	Walker and Collinson, Architects, Swan Arcade, Bradford.
Mar. 4	London, W.—Underground Convenience	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
„ 4	Felixstowe—Hotel	D. A. Tollemache	T. W. Cotman, Architect, Northgate Street, Ipswich.
„ 13	London, S.E.—Infimary	Camberwell Guardians	E. T. Hall, 57 Moorgate Street, E.C.
	ENGINEERING.		
Feb. 15	Stockholm—Telephone Cables	German Telephone Company	Commercial Department, Foreign Office, Whitehall.
„ 15	Eastbourne—Air Compressors, &c.	Highways and Drainage Committee	F. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
„ 15	Valetta, Malta—Arc Lamp Carbons	—	Superintendent of Public Works, Malta.
„ 15	Kirkcaldy—Boilers	Corporation	W. L. Mauudoc, Town Clerk, Kirkcaldy.
„ 15	Halesowen—Various	Hospital Committee	A. T. Butler, Architect, Cradley Heath.
„ 15	Stirling—Plant	Town Council	T. L. Galbraith, Town Clerk, Stirling.
„ 16	Brynamman, Wales—Heading, &c.	—	W. Evans, Gwauncaegurwen Collieries, Brynamman.
„ 16	Plymouth—Dredging, &c.	Cattewater Commissioners	H. V. Prigg, 6a Courtenay Street, Plymouth.
„ 16	Port St. Mary, Isle of Man—Iron and Steel Work	Gas Company	T. Newbigging and Son, 5 Norfolk Street, Manchester.
„ 16	Croydon—Boilers	Town Council	Borough Electrical Engineer, Factory Lane, Croydon.
„ 16	Walsall—Purifiers, &c.	Gas Committee	B. W. Smith, Pleck Gasworks, Walsall
„ 18	Long Eaton—Electricity Plant	Urban District Council	F. Worrall, Council Offices, Long Eaton.
„ 18	Brigstock, Northants—Well	Parish Council	B. Thompson, Northampton.
„ 18	Coventry—Heating, &c.	—	City Engineer, Town Hall, Coventry.
„ 18	Wimbledon—Boilers, &c.	Urban District Council	F. B. Spencer, Electrical Engineer, Durnford Road, Wimbledon
„ 13	Dawley, Shropshire—Borehole	Water Supply	T. S. Stooke, Port Hill Road, Shrewsbury.
„ 19	Swansea—Heating	School Board	A. W. Halden, Clerk, Dynevor Place, Swansea.
„ 19	London, S.W.—Water-tube Boilers	County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 19	Cellyhurst, Manchester—Connecting Lines	Lancashire and Yorkshire Railway Co.	Engineer's Office, Hunt's Bank, Manchester.
„ 19	Headington—Temporary and Stone Bridges	Rural District Council	L. Turner, Surveyor, Hartfield Cottage, New Headington, Oxon.
„ 20	Dundee—Hopper Barges	Harbour Trustees	G. C. Buchanan, Harbour Engineer, Harbour Chambers, Dundee.
„ 21	Bristol—Coal Conveyor, &c.	Electrical Committee	H. F. Proctor, City Electrical Engineer, Temple Back, Bristol.
„ 21	Huelva, Spain—Telephone System	—	Commercial Department of the Foreign Office, Whitehall, S.W.
„ 22	Glasgow—Car Equipments	Corporation	J. Young, 88 Renfield Street, Glasgow.
„ 23	Hitcham, Suffolk—Boring	Rural District Council	A. Newman, Clerk, Churchgate Street, Hadleigh.
„ 25	Beckenham—Electricity Plant	Urban District Council	R. P. Wilson, 66 Victoria Street, Westminster.
„ 27	Bristol—Culvert	Corporation	City Engineer, Municipal Buildings, Bristol.
„ 27	Christiania, Norway—Trucks	State Railways Administration	Director Machinery Department, 8 and 9 Jeinbanetervet, Christiania.
„ 27	York—Widening	North-Eastern Railway Company	W. J. Cudworth, Engineer, N.E.R. Station, York.
„ 27	York—Widening	North Eastern Railway Company	C. A. Harrison, Central Station, Newcastle-on-Tyne.
„ 28	Wanstead, N.E.—Concrete Tanks, Sewage Filters, &c.	Urban District Council	J. T. Bressey, Surveyor, Council Offices, Wanstead, N.E.
„ 28	Wellington, New Zealand—Engines	Corporation	J. Duthie and Co., Limited, 23 Lime Street, London, E.C.
Mar. 2	Bournemouth—Electric Cars	Town Council	F. W. Lacey, Borough Engineer, Municipal Buildings, Bournemouth.
„ 2	East Dereham—Purifiers	Urban District Council	H. Kitson, Gasworks, East Dereham.
„ 4	Luton—Wiring	Town Council	Borough Engineer, Luton.
„ 4	Lincoln—Boring	Waterworks Committee	P. Griffith, 54 Parliament Street, Westminster, S.W.
„ 11	Santandar, Spain—Floating Dredger	Committee of Works	Corporation Offices, Santander.
April 1	Amsterdam—Electrical Plant	Burgomaster en Werthouders	Director, Town Printing Works, Achterburgwal 213, Amsterdam.
„ 10	Rosario—Harbour Works	Argentine Government	Commercial Department, Foreign Office, S.W.
	IRON AND STEEL.		
Feb. 15	Valetta, Malta—Joists	—	Superintendent of Public Works, Malta.
„ 15	Plympton St. Mary, Devon—Tank, &c.	Rural District Council	F. E. T. Cleverton, 4 Buckland Terrace, Plymouth.
„ 16	Blackburn—Shovels, Picks, Chains, &c.	—	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
„ 16	Torquay—Ironmongery, &c.	Water Committee	W. Ingham, Water Engineer, Torquay.
„ 19	Egremont, Cheshire—Rails, &c.	Wallasey Urban District Council	W. H. Travers, Church Street, Egremont.
„ 19	London, N.—Sluice-valve Hydrants	Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
„ 20	Sheffield—Two Iron Staircases	Wadsley Asylum Committee	Clerk of Works, Wadsley Asylum, Sheffield.
„ 21	London, S.W.—Ironmongery, Lamps, &c.	—	Director of Navy Contracts, Admiralty, S.W.
„ 21	Plymouth—Hydrants, Stop-cocks, Cast-iron Valves	Corporation	Municipal Offices, Plymouth.
„ 22	Glasgow—Rails	Corporation	J. Young, 88 Renfield Street, Glasgow.
„ 25	Glasgow—Iron and Steel Work	Corporation	W. Foulis, 45 John Street, Glasgow.
Mar. 27	Amsterdam—Pipes	H.M. Ministry	M. Nijhoff, Bookseller, The Hague.
	PAINTING AND PLUMBING.		
Feb. 18	Darenth, near Dartford—Painting, Plumbing, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, S.W.
„ 21	Plymouth—Lead Pipe and Pig Lead	Corporation	Municipal Offices, Plymouth.
Mar. 1	Cairo—Paints, &c.	Barrage Administration	Barrage Administration, Cairo.
	ROADS AND CARTAGE.		
Feb. 16	Banbury—Carts	Town Council	N. H. Dawson, Borough Surveyor, Town Hall, Banbury.
„ 16	Blackburn—Setts, Flags, Ashlar, &c.	Corporation	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
„ 16	Morley, Yorks—Carts	Sanitary Committee	W. E. Putman, Borough Engineer, Town Hall, Morley.
„ 16	Accrington—Granite Setts, &c.	General Works Committee	W. J. Newton, Borough Engineer, Town Hall, Accrington.
„ 16	Bridgend—Material, &c.	Glamorgan County Council	T. L. Edwards, County Surveyor, Town Hall, Bridgend.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	Roads and Cartage.—*Continued.*		
Feb. 16	Spilsby, Lincs—Granite, Slag, &c.	Rural District Council	T. A. Busbridge, District Surveyor, Spilsby.
„ 16	Stretford—Street Works	Urban District Council	H. Royle, Surveyor, Council Offices, Old Trafford.
„ 16	Chelmsford—Tram Labour	County Council	P. J. Sheldon, Chief Surveyor, County Offices, Chelmsford.
„ 16	Plymouth—Granite, Kerb Setts, &c.	——	J. Paton, Borough Engineer, Plymouth.
„ 16	Boston, Lincs—Granite, &c.	County Council	H. C. Johnson, Sessions House, Boston.
„ 16	Headington, Oxford—Materials	Rural District Council	L. Turner, Hartfield Cottage, New Headington.
„ 18	Hertfordshire—Materials, &c.	County Council	U. A. Smith, 41 Parliament Street, Westminster.
„ 18	Hendon, N.W.—Materials, Sewering, &c. (two contracts)	Urban Borough Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
„ 18	Essex—Broken Granite	County Council	Chief Surveyor, County Offices, Chelmsford.
„ 18	Egremont, Cheshire—Street Works	West Lancashire Rural District Council	C. Law-Green, Union Offices, Ormskirk.
„ 19	Aldershot—Works	Urban District Council	Surveyor, Council Offices, Aldershot
„ 19	East Retford, Notts—Granite and Slag	Corporation	J. D. Kennedy, Borough Surveyor, East Retford.
„ 19	Salisbury—Stones and Gravel	Rural District Council	J. Hodding, Clerk, Market House Chambers, Salisbury.
„ 19	Woodbridge—Hauling	Rural District Council	G. Cook, Surveyor, Woodbridge.
„ 19	London, S.W.—Lamp Columns, Lanterns, &c.	Wandsworth Borough Council	Council House, East Hill, Wandsworth, S.W.
„ 19	London, S.W.—Materials	Wandsworth Borough Council	H. G. Hills, Town Clerk, Council House, Wandsworth, S.W.
„ 20	Hamilton, Scotland—Road Metal, &c.	——	A. Rankin, Road Surveyor, Airdrie.
„ 20	Uckfield, Sussex—Flints and Ragstone	Rural District Council	F. Holman, 86 High Street, Lewes.
„ 20	London, S.W.—Making-up Roads	Fulham Borough Council	C. Botterill, Surveyor, Town Hall, Walham Green, S.W.
„ 21	Horncastle, Lincs—Granite and Slag	Rural District Council	J. E. Chatterton, Clerk, Council Offices, Horncastle.
„ 22	Wood Green—Granite, Gravel, Horses, &c.	Rural District Council	C. J. Gunyon, Surveyor, Town Hall, Wood Green, N.
„ 22	Wood Green—Making-up Roads	Rural District Council	C. J. Gunyon, Surveyor, Town Hall, Wood Green, N.
„ 23	Lewes—Materials, &c.	County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
„ 25	Beckenham—Guernsey Granite, Flints and Gravel	Urban District Council	Council Offices, Beckenham.
„ 25	Sheffield—Labour and Materials	Highway and Sewerage Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
„ 25	Hastings—Ragstone	Corporation	P. H. Palmer, Town Hall, Hastings.
„ 25	Hastings—Guernsey Granite	Corporation	P. H. Palmer, Town Hall, Hastings.
„ 27	Hailsham—Materials, &c.	Rural District Council	E. Catt, Clerk, Church Street, Willingdon.
Mar. 4	London, N.—Works and Materials (14 contracts)	Hornsey Urban District Council	E. J. Lovegrove, Engineer to the Council, Southwood Lane, Highgate.
„ 6	South Shields—Materials	Corporation	S. E. Burgess, Borough Engineer, Chapter Row, South Shields.
	SANITARY.		
Feb. 15	Wolverhampton—Lime	Sewerage Committee	W. Clifford, Manager, Sewage Outfall Works, Wolverhampton.
„ 16	Evesham—Sewerage Works	Corporation	R. E. W. Bevington, Bank Buildings, Wolverhampton.
„ 18	Blackburn—Reconstruction of Privies	Health Committee	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
„ 18	London, N.—Sewers, &c.	Hornsey Urban District Council	E. J. Lovegrove, 99 Southwood Lane, Highgate, N.
„ 18	Wellingborough—Sewage Works	Rural District Council	E. W. Ives and J. Waugh, Sunbridge Chambers, Bradford.
„ 19	London, S.W.—Disinfectants	Wandsworth Borough Council	Council House, Wandsworth, S.W.
„ 25	Withington, Lancs.—Sewers	Urban District Council	A. H. Mountain, Engineer to the Council, Town Hall, Withington.
Mar. 4	London, N.—Works and Materials (14 contracts)	Urban District Council	E. J. Lovegrove, Engineer to the Council, Southwood Lane, Highgate.
„ 7	Cannock, Staffs—Sewage Works	Urban District Council	Council Offices, Cannock.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the Work.

ARBROATH.—Accepted for the plumber, slater and plasterer's work required in erection of a joint infectious diseases hospital for the burgh of Arbroath and the Arbroath district of the county of Forfar. Mr. Hugh Gavin, architect, Arbroath :—

Christie & Anderson, masons	£4,263 7 6
A. Scott, joiner	2,640 0 0
D. McKay, Carnoustie, plumber	1,385 0 0
J. Mitchell & Sons, slaters	382 19 0
Middleton & Donald, plasterers	389 0 0

[All of Arbroath.]

BELVEDERE, Kent.—For the erection of proposed Board offices, &c., and cookery centre at Picardy Schools, Belvedere, for the Erith School Board. Messrs. Ford, Son & Burrows, architects, Aldermanbury, E.C. :—

Board offices, pupil teachers', attendants' and waiting rooms, &c.

Woodward & Co.	£4,298	Miles	£3,860
Patman & Fotheringham	3,958	Foster Bros.	3,504
Martin, Wells & Co.	3,951	Proctor	3,493
Tonge	3,916	Thomas & Edge	3,464
Jerrard & Sons	3,874	Enness Bros.*	3,363

Cookery centre, &c.

Woodward & Co.	£2,301	Miles	£2,142
Patman & Fotheringham	2,181	Foster Bros.	2,013
Martin, Wells & Co.	2,179	Proctor	2,295
Tonge	2,088	Thomas & Edge	2,069
Jerrard & Sons	2,198	Enness Bros.*	1,997

Alterations and additions to drains and to caretaker's house, infants', boys' and girls' school, by Jennings.

Woodward & Co.	£625	Miles	£547
Patman & Fotheringham	574	Foster Bros.	540
Martin, Wells & Co.	601	Proctor	547
Tonge	558	Thomas & Edge	565
Jerrard & Sons	603	Enness Bros.*	547

* Accepted.

BRITON FERRY, Wales.—For the erection of a public library and Council offices and other work in connection therewith, for the Briton Ferry Urban District Council. Mr. H. Alex. Clarke, architect, Briton Ferry :—

J. S. Chubb & Co., Cardiff	£4,135 5 3
J. E. Evans, Cardiff	3,579 0 0
D. Jenkins, Swansea	3,500 0 0
Bennett Bros., Swansea	3,450 0 0
Bowers & Co., Hereford	3,420 0 0
A. J. Howell, Cardiff	3,416 13 10
L. Gower, Briton Ferry	3,315 17 6
M. Cox, Port Talbot	3,150 0 0
J. Goodridge & Son, Swansea	3,188 10 0
W. E. Willis, Ystrad	3,117 0 0
T. Watkins, Limited, Swansea	3,094 0 0
T. W. Waters, Swansea and Briton Ferry*	2,970 15 0
D. Thomas & Son, Cardiff	2,929 16 6

* Accepted. [Architect's estimate, £2,965.]

DEVONPORT.—For alterations to St. Aubyn Vicarage, for the Rev. Coulthard. Mr. Edgar M. Leest, architect, Public Hall Chambers, Devonport :—

W. J. Oliver	£138 5 5	A. Truscott	£102 0 0
T. Jenkin & Son	122 0 0	S. Perkins, Devonport*	99 15 6
J. Healy & Son	121 15 0		
D. Veale	110 16 8		

* Accepted.

GOUROCK, Scotland.—For the laying of whinstone or granite setts and tar macadam pavement, &c., on the principal thoroughfare of the burgh, for the Town Council. Mr. Alexander Duthie, C.E., burgh surveyor :—

J. Greenshields & Co., Glasgow	£8,551 2 6
W. Wilson, Croy	8,417 5 0
A. A. Lang, Gourock	8,048 18 4
D. & J. Stratton, Sandwich Place, Edinburgh	7,220 0 0
W. Shepherd, Milkstone, Rochdale*	5,047 15 0

Tar macadam only.

Wilson & Leitch, Glasgow	5,625 0 0
G. Halliday, Limited, Rothesay	3,562 10 0
W. G. Walker & Co., Ayr	3,562 10 0

* Accepted.

KINGSTON-ON-THAMES.—For the erection of additions to laundry and coal stores at the Kingston Workhouse. Mr. W. H. Hyde, architect, 87 Brayards Road, Peckham, S.E. Quantities supplied :—

J. W. Brooking	£3,000 0 0	E. Chamberlain	£2,608 5 9
Goddard & Sons	2,888 0 0	W. J. Renshaw	2,497 0 0
E. F. McCarthy	2,766 13 3	Veale & Carter	2,398 0 0
Windsor & Co.	2,711 8 0	W. J. Bowden	2,122 10 0
Foster Bros.	2,677 0 0		

LONDON, W.—For forming a new street from Kensington Square to Charles Street, for the Kensington Borough Council. Mr. Wm. Weaver, C.E., borough engineer :—

H. Boyer, Terminus Wharf, Paddington, W.	£1,392 0 0
Acme Wood Flooring Co., Victoria Park, N.E.	1,388 5 10
J. Mowlem & Co., Grosvenor Wharf, Westminster	1,362 0 0
E. Rogers & Co., 6 St. Lawrence Road, Notting Hill, W.	1,347 0 0
J. Mears, Crab Tree Wharf, Fulham	1,340 0 0
Improved Wood Paving Co., 46 Queen Victoria Street, E.C.	1,327 0 0
B. Nowell & Co.,* Warwick Road, W.	1,300 0 0

* Accepted.

LONDON, N.—For the erection of new branch library at Highgate, for the Hornsey Urban District Council. Mr. W. H. Hyde, architect, 87 Brayards Road, Peckham, S.E. Quantities supplied :—

Leslie & Co.	£5,258	Wilson Bros. & Lamplough	£4,516
Thompson & Beveridge	4,912	W. T. Batchelor	4,360
Kerry and Sons	4,800	Willmott & Sons	4,286
General Builders' Co.	4,797	Foster Bros.	4,174
H. L. Holloway	4,781	Lawrence & Sons	4,169
Spiers & Sons	4,676	Webking & Co.	4,161
Chessum & Sons	4,613	W. Wade	3,998
J. Appleby	4,600		

ROCHFORD, Essex.—For the erection of an isolation hospital near Sutton Ford Bridge, Rochford, Essex, for the Rochford Rural District Council. Messrs. C. & W. H. Pertwee, architects, Chelmsford :—

Foster Bros., Suffolk Road, Norwood Junction, S.E.	£5,169
Gibb & Co., 1a Birchfield Street, West India Road	4,800
Smith & Son, Chipping Hill, Witham	4,669
A. W. Robins, High Street, Wanstead	4,598
S. Parmenter, Braintree	4,500
Enness Bros., Erith Road, Erith	4,498
Snewin Bros., High Road, Upper Clapton	4,464
West Bros., Caxton Road, Strood, Kent	4,430
E. West, Chelmsford	4,242
J. Rayner, East Hanningfield	4,078
Davis & Leaney, Lancaster Gardens, Southend	4,028
Hammond & Son, Romford	3,989
F. Dupont & Co., Southchurch Road, Southend	3,987
T. H. Coleman, Foster Hill Road, Bedford	3,945
F. & E. Davey, Queen's Road, Southend	3,897
Coulson & Loft, East Road, Cambridge	3,888
W. E. Daney, Burdett Avenue, Southend	3,820
S. Norden, Rochford,*	3,810
Harris & Rowe, Shoeburyness	3,724

* Accepted.

ROMFORD.—For the laying-out and fencing of a cemetery at Upminster, and the erection of a chapel, &c., in connection therewith, for the Romford Rural District Council. Mr. E. M. Whitaker, architect, 1 Gresham Buildings, Basinghall Street, London, E.C. :—

S. Saunders, Earl's Court Square, W.	3,120
Sumpter Bros., Plaistow	2,649
D. Gibb & Co., West India Dock Road	2,565
Bowman & Sons, Stamford	2,348
Griffiths & Co., Limited, Bishopsgate Street, E.C.	2,214
T. Bruty, Hornchurch	2,127
W. Hook, Upminster	2,080
S. Parmenter, Braintree	2,016
Coulson & Loft, Cambridge	1,919
Hammond & Son, Romford	1,897
Dowsing & Davis, Romford	1,895

SOUTH SHIELDS.—Accepted for rebuilding "The Blue Bell" Inn, at Ryhope, Sunderland, for "Joseph Johnson." Mr. Henry Grieves, A.R.I.B.A., architect, Albany Chambers, South Shields :—

Taylor & Welford, Sunderland	£3,255

SURBITON.—For the erection of mortuary, Alpha Road, and road works, Tolworth and Surbiton Hill, for the Urban District Council. Mr. S. Mather, A.M.I.C.E., surveyor :—

Mortuary.

E. Tomkinson	£798 0 0
McDonald Bros.	733 0 0
Higby & Rawson, Thames Ditton	674 12 0
W. Hobern	609 0 0
J. Pavey, Wood Green	598 0 0
G. Merredew,* Kingston-on-Thames	598 0 0

[Surveyor's estimate, £617 2s.]

Making-up Roads.

R. M. Parkinson, Peterborough	£2,598 0 0
C. Ford, Harlesden	2,170 0 0
Fry Bros., Greenwich	2,168 16 8
Free & Sons, Maidenhead	2,088 15 2
T. Adams, Wood Green	2,057 9 8
S. Atkins, Kingston-on-Thames	1,841 0 0
J. Nicholas	1,751 16 0
S. Kavanagh*	1,650 4 9

[Surveyor's estimate, £1,699 2s.] [Rest of Surbiton.]

* Accepted.

WEST HAM.—For making up the following streets, for the West Ham Town Council :—Bethell Avenue, Florence Street (part), Shepherd Street (part), Chargeable Street (part), Pigwell Lane, Gipsy Lane (part), Chatsworth Passage, Passage Whitehall Place, Sutton Court Road (part), Upperton Road (part), Pond Road, Richardson Road, Wakelin Road. Mr. John G. Morley, borough engineer :—

T. Adams, Green Lanes Goods Station, Great Eastern Railway, Wood Green	£7,686 11 6
R. Ballard, Limited, Child's Hill, N.W.	7,591 3 11
J. Jackson, Broadway, Plaistow	7,362 5 7
D. T. Jackson, 104 Ripple Road, Barking	7,309 10 9
W. Griffiths & Co., Limited,* Hamilton House, Bishopsgate Street, E.C.	6,948 18 7

* Accepted.

WHITBY.—For extensions and alterations to the Fylingdales Waterworks, for the Whitby Rural District Council. Mr. John Rickinson, Robin Hood's Bay, engineer :—

A. Palfreman, Whitby	£2,655 0 0
F. W. Winterburn, Whitby	2,640 0 0
J. Stephenson, Whitby	2,495 0 0
E. Russell,* Robin Hood's Bay	2,888 10 0

* Accepted.

Godalming Old Market Hall.—The Town Council of Godalming had a debate recently on the subject of what should be done with this hall, when it was proposed to repair it and utilise it as a reading room. Amendments to take a vote of the burgesses, and to defer the matter, were both negatived. One member suggested selling the hall to those who had petitioned for its preservation, and asking them to take it away and preserve it, whilst another described the building as a hideous obstruction. The council decided by eleven votes to six to repair and maintain the hall.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

FEBRUARY 20, 1901.
No. CCCXV.

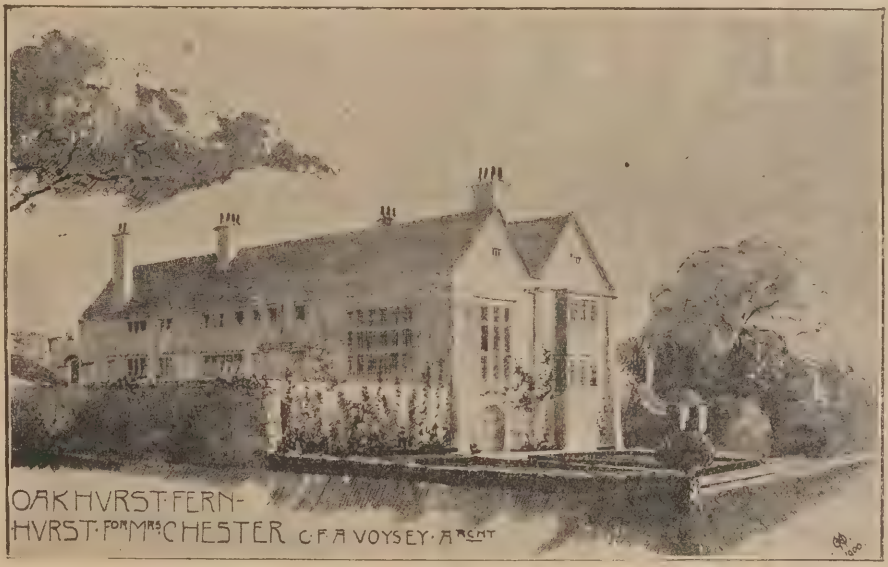
EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

An Architectural Causerie.

A Monument To Queen Victoria. MANY years ago the Prince Consort suggested that the public offices should be removed from Whitehall to South Kensington, and occupy the site now filled by the Imperial Institute the Natural History Museum and other buildings. In those days the Thames was not embanked; several of the older Government buildings were very insignificant, and the idea of a systematic laying-out of Whitehall, though entertained for a moment, had been given up. It was said that under the proposed scheme the buildings "would be out of the smoke," but the growth of London has long since dispelled that notion. The project was abandoned, but a land of museums has taken its place and close by is the Prince Consort's own monument. Where will the Queen's be placed? From the point of view of architectural effect and the embellishment of London the question is of the highest importance. The suggestion will possibly be made that it should stand near the Albert Memorial, yet what an opportunity would be lost if this were done, for another site seems infinitely better adapted for the purpose; this is the open space known as Parliament Square. Here are two little grass plots with statues of statesmen at their outer edge placed at long distances apart, "emphasising nothing by nothing emphasised," surrounded by vast empty spaces and wide roadways. On the whole the effect of these clearances is pleasant, but the total space is a little too wide for the finest architectural effect; the great buildings are well seen, but are also slightly dwarfed; the eye gets accustomed to them as they are so gradually approached, and we lose the sense of size; in short, to be effective, buildings and spaces must be proportioned to each other. St. Margaret's Church is the only object which gives scale to the Abbey. Something more however is required to obviate the sense of vacuity; something large and high, yet not so large as to encroach upon the public space or to narrow any thoroughfare. Surely a mighty monument to Queen Victoria might fitly be erected here, and the effigies of statesmen now so oddly scattered about re-arranged and grouped at its base. The details cannot be foreshadowed now, but in historic Westminster it would be in accordance with the fitness of things that the monument should be Gothic. Architecturally speaking, there is something wanting to break the vast void north of the Abbey without filling it; and the need will be greater when the old houses in Abingdon Street are pulled down, as they soon will be. There is some danger indeed of creating *un boulevard à vue infinie*—a huge vista apparently leading nowhere—and that is a thing much to be deprecated.

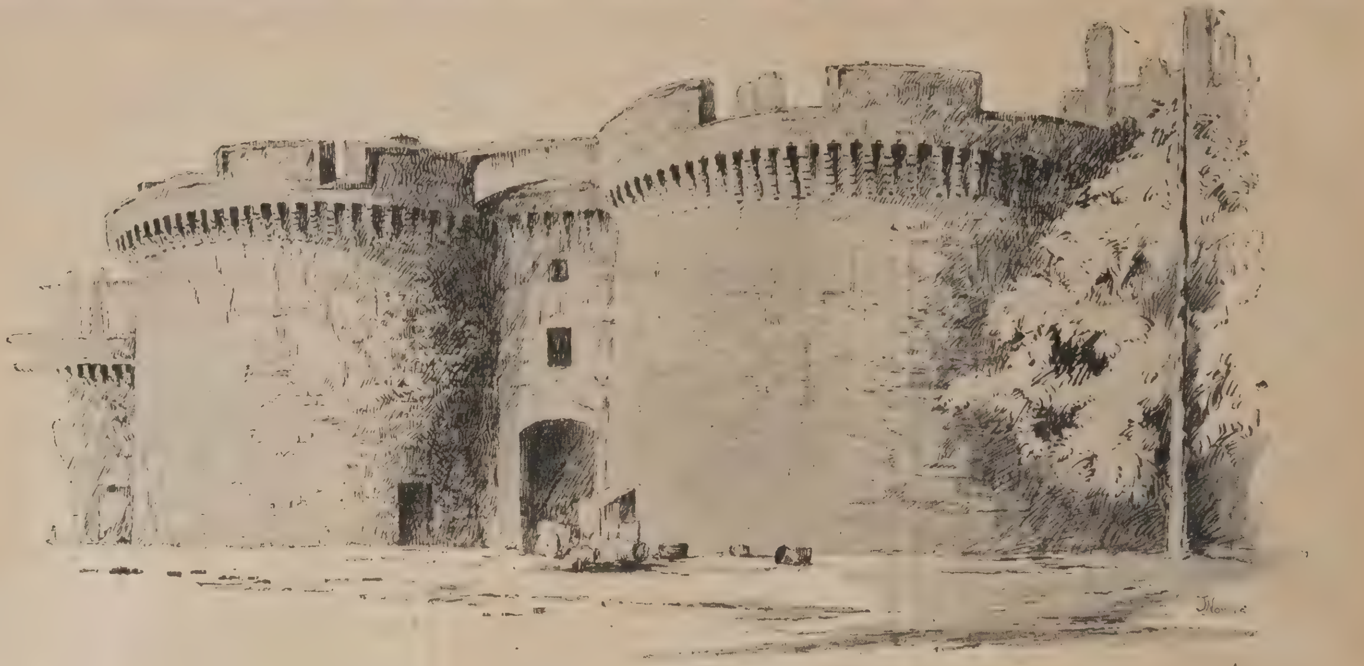
The Blind School, St. George's Circus. THE latest architectural victim to public improvement is the building known as the School for the Indigent Blind at St. George's Circus. This spot was originally called St. George's Fields, and attained a certain celebrity as the place where the followers of Lord George Gordon assembled in 1780, preparatory to marching upon Westminster. The present building dates from 1834, and was designed by the late John Newman. It is long and low, pleasantly proportioned, and broken by two excellent and picturesque towers. Standing at the junction of two thoroughfares, the site has been cleverly utilised; the low elevation consisting of two small storeys spread out to such a length speaks of 1834—when there was less pressure of population upon land; many a modern architect would be glad to have such freedom for his plan. The structure is noticeable only for its towers, which deserve a word of description. The salient angle is occupied by a vaulted gateway with a slightly flattened Tudor arch; a large oriel window is over it with a small ornamental parapet; the detail is everywhere good. Halfway down the long flank of the building is another gateway and tower, the latter broken by a high narrow oriel of pleasing design. The whole building is doomed to make way for the new electric railway from Baker Street to Waterloo, and the only question is whether the pretty Tudor tower and gateway at the angle of the building could still be preserved and utilised as an entrance. A station entered by a vaulted Gothic gateway under an oriel would be a pleasant novelty in South London.

The Pediment. IT is difficult to state exactly the derivation of the word "pediment," but it most probably comes from the Latin *pes, pedis*, a foot—as ancient pediments were often finished at the crown with a statue or ornament. But, whatever be its true derivation, it was always considered as an important part of the building it embellished. At the present time it often receives no such consideration. It is treated as a separate feature, and instead of forming part of the architectural scheme we see it stuck on the eaves in the most distressing manner. It is generally broken at the top to receive some kind of "pepper-pot," and, to aggravate its incongruity, sometimes needs to be supported by an iron stay fixed in the roof! Buildings are not meant to be looked at from the front only, though by the practice referred to one would suppose such to be the case. If the intention is to secure a pleasing skyline, it certainly fails—rather it gives the building a top-heavy appearance, and the pediment itself looks as if it could be pushed off with little trouble. Examples of this manner of building are plentiful in our streets. Seing how a pediment proper may be made to give such a finish to a front, what a pity that it should be replaced by these wretched make-shifts!


OAKHURST FERNHURST FOR MRS CHESTER
C F A VOYSEY ARCHT
1900

(*See page* 44.)

Colour in Streets. THE tendency of modern life is to banish colour, especially warm colour, from our midst. A modern crowd, that is a crowd of "men only," is mainly black, grey or neutral tinted; the appearance of a populous street at midday is the same, and very few articles for outdoor use are of any but the soberest hue. The interiors of our dwellings exhibit the same tendency, and although the black groundwork for carpets, black furniture in dining-rooms, and "sad colours" relieved only by sage green which were fashionable eighteen or twenty years ago have been superseded by something more cheerful, the rule of modern life is still to distrust colour, to introduce it only as a relief, and very sparingly. Gilding—that is, gold as a colour—plays but a very small part in systematic decoration: which of our new buildings has a Golden Gallery like Hatfield, or a Gilt Room like Cobham Hall? In the last century our streets were full of colour; the present age began with the introduction of low-toned colouring, if colouring it can be called. The red-brick revival, and the use of tiles and terra-cotta may be looked upon as a protest against dinginess and colourlessness, as an attempt to revive colour in our streets, but in the ages of warm colouring it was universally applied together with ornament to every object that admitted of it. A little warm colour has been used of late upon houses with stucco fronts, often very happily, but yet with a sparing hand; chocolate seems to be the favourite hue in these cases. A square with none but stucco fronts would seem to admit of a beautiful system of painted decoration *if treated collectively*—that is by arrangement and combination among the inhabitants—but where are such artistic and public-spirited inhabitants to be found? The revival of colour as a part at least of architectural effect is much hampered by public ignorance; as usual, popular "art" has rushed from one extreme to the other; where once stood a quiet old-fashioned house with a moderate area of shop-window on the street level, we have a staring pile which, not content with red brick and freestone dressings, must needs be decked out with polished marble, an enormous metal sign, great lamps, brightly-coloured tiles, and, at night, a vast transparency for a vulgar advertisement. The main thoroughfares of London exhibit much of this tinsel, and even in buildings where some knowledge of architecture is evident several materials of different colours are often found most unpleasantly combined; Peterhead granite polished like glass, bricks of a loud red, and lemon-coloured terra-cotta are not perhaps the only materials used in a single design; the whole picture is irritating; better the sober Palladian of a hundred years ago than such a crude mass of colour. One of the worst examples of the ignorant use of colour is to be seen just now in Waterloo Place. It is one of the few streets in London symmetrically designed and depending somewhat upon columns for its appearance. But the architectural effect of columns in all ages has been, and was always intended to be, that of vertical lines of light against shade; here this has been deliberately reversed, for whilst the background of wall is a light cream colour, the columns have been painted a particularly ugly chocolate-brown; the result is something extremely displeasing. It spoils one of the few fine streets which we possess.



ST. MALO : LA GRANDE PORTE.

ST. MALO.

BY F. H. CHEETHAM.

THE man with the sketch-book and the rod, whose time in northern France is limited, naturally devotes that time to the rich treasures of Normandy and the Ile de France. He may stray westward as far as Mont St. Michel, but he does not generally go into Brittany, unless he is seeking the picturesque as well as the architectural. The artist and the holiday-maker know St. Malo better than the architect. The novelist, too, has found it out, for the sea-girt city forms an admirable background for romance.

The place exercises upon you a strange fascination that is not at first easy to account for. After visiting St. Malo you feel that you have been looking upon a town such as you have not seen before. Wherein, you ask yourself, does it differ from other towns—towns perhaps that boast of older and more magnificent buildings, and more full of historic interest?

The secret, I think, we can discover in the fact, so well described by Mr. Douglas Sladen, that St. Malo, more perhaps than any other town in France, has preserved the appearance of a mediæval city—and this in spite of there being very few of its buildings, as we see them to-day, that date from mediæval times.

"Those who have seen St. Malo from the sea at early morning or sunset," says Mr. Sladen, "with its huge grey ramparts surmounted by huger grey houses, and the whole capped by St. Malo's one spire will never forget the sight; for looking upon it they see a city as men saw cities in the Middle Ages."

Compare Rouen with St. Malo. The architectural wealth of the one is in such violent contrast with the architectural poverty of the other as to well warrant the student-holiday-maker giving the City on the Rock the cold shoulder. Rouen bristles with mediæval buildings, yet in looking down from the heights of St. Catharine we do not see a city as men saw cities in the Middle Ages. Besides spires we see tall smoking chimneys, and when we go down into the streets we find Necessity and Progress have spread far beyond the walls of the old town. The walls have disappeared, making way for broad and handsome boulevards. The city is pierced from north to south by wide streets, which, however much the artist may regret them, are none the less necessary if the work of Rouen is to be done efficiently and well. Big steamers lie moored at her quays, and commerce reigns and makes of Rouen a modern city, despite her picturesque clinging to the past.

Walls may be built round a city, but as times change and more room to live in is needed, the city spreads outside the walls, whose protection it no longer needs. Where can we find a city contained to-day within the same limits as in the Middle Ages? St. Malo is almost one such city. As far as appearances go it is such a city, for if it has been enlarged from time to time, this was either before the present walls were finished, or else they have accommodated themselves to include the added area. St. Malo being built on a rock in the sea—joined only on the north-east corner to the mainland by a narrow isthmus—has never been able to grow much beyond her ancient limits. She stands to-day a sea-girt city, much as she must have stood for hundreds of years, and as she will probably stand for hundreds of years to come. All around her, at Paramé, at St. Servan, at Dinard, the world may advance, may be as intensely modern as ever you please (indeed, just outside her own walls, on the sands, St. Malo herself is very up to date, and has built herself a Casino under the shadow of the Castle), but within her walls the city preserves all the characteristics of the days of long ago. Everywhere we come across splashes of colour and picturesque fragments that bring joy to the heart of the man with the sketch-book who doesn't bother with the rod.

But it is from the sea that the impression of St. Malo as a mediæval city is strongest. It is a favourite excursion in the summer time to sail over from Jersey. You can return next day, or, if you like, you can have a three days' tour in France, going on from St. Malo to Mont St. Michel, or to Dinan, and work round by Avranches to Granville, and thence back to Jersey again.

As you approach the old sea-birds' nest—the city that gave birth to Jacques Cartier, Duguay-Trouin, Robert Surcouf and Labourdonnais—you can at first scarce distinguish it from the neighbouring towns on the mainland. Far away on the left as you near the mouth of the Rance you may distinguish the conical mass of Mont St. Michel showing blue on the horizon. As you draw nearer to the coast St. Malo begins to detach itself. You sail round three sides of it, and land on the quay that faces south. It is all very perplexing unless you have a map with you, or have been before and know the lie of the land.

From the sea St. Malo's solitary spire looks very mediæval. But it is not. The ramparts and gates remind us of the battle and defence of the age of chivalry. But we are again deceived. For Joanne tells us that the walls were designed by Vauban, and built at the beginning of the eighteenth century. And so our guide-book disillusions us. In this short article there can be no attempt at giving a description of St. Malo, or relating its history. For those who seek information there are always the guide-books to refer to, and as a supplement to these there is Mr. Sladen's very admirable little volume "Brittany for Britons," from which I have quoted. Mr. Sladen draws largely from Joanne and from other French sources, especially from M. Harvut's interesting St. Malo guide.

Still, despite the rude shock to our mediæval hopes, we find St. Malo, in all respects but in date and detail, a city as men saw cities in the Middle Ages. The castle, however, can boast a respectable antiquity. It stands at the head of the isthmus, and must be passed on entering the city from the mainland. Its most ancient part—the old keep, called the "grand donjon"—existed before 1378, but the greater part of the castle dates from the days of Anne of Brittany, being commenced about 1475. Before this time, it must be remembered, Brittany was a Duchy independent of the Crown of France. The Duchess Anne, by her marriage with Charles VIII., united the Duchy of Brittany with France, and "lost her sovereignty by becoming a queen." The Malouins did not like the building of this castle at their gates, holding the city as it were at its mercy, and their complaints reached the ears of Anne. She accordingly had inscribed on one of its towers the words: "Qui qu'en grogne, ainsi sera, c'est mon bon plaisir" (whoever growls at it, thus shall it be, it is my pleasure), and to this day the town is known as the Quiquengrogne.

The cathedral is a building of not very great interest. Since the Revolution there has been no bishop, and I sometimes wonder whether it has any right to be called a cathedral at all. On the plan of St. Malo in Black's Guide, it figures as the Parish Church. It is situated in the middle of the town and part of it dates from the twelfth century. The choir and chapels belong to the fourteenth and fifteenth centuries, but the greater part of the nave is Renaissance work of the sixteenth century. The façade was rebuilt in 1713. The tower belongs to the fifteenth century, and until 1859 was without a spire. We can hardly imagine St. Malo to-day without its stone flèche, but it was by a mere accident that it ever came to possess it. At least, so the story goes. Napoleon III., in one of his tours in this part of the country, visited Dinan and St. Malo. Both towns are in the Department of Ille-et-Vilaine. At Dinan is a church dedicated to St. Malo. It lacks a spire. Napoleon noticed this, and on his return to Paris sent a sum of money to the authorities of the Department with instructions to complete "the church of St. Malo." But he forgot to state that it was the church of St. Malo in Dinan which he meant, and so the spire was put on the wrong church. But it was a mistake that few will regret.

The ramparts are the great attraction of St.

Malo. They form the principal promenade of the town, and from them magnificent sea-views can be obtained. The scenery at the mouth of the Rance is strangely beautiful, and St. Malo in the flaming sunlight of a summer evening is a sight that does not soon fade from the memory.

Behind the ramparts rise the picturesque eighteenth-century houses erected by the East India merchants. They are built of granite, with high-pitched roofs and lofty chimneys. "Unlike most French houses," says Mr. Sladen, "they have no lattices; but they have double windows to shut out the draughts of Atlantic storms, and the outer windows folded back on the walls give a fine effect at sunset."

Inside, the city is full of old houses of the sixteenth, seventeenth and eighteenth centuries. In one of these was born Duguay-Trouin. It is a house much prized by the Malouins—an old wooden house of four storeys, the uppermost of which projects and has a continuous window across its entire breadth. There are plenty of these picturesque old timber houses in St. Malo, though the principal dwellings, those, for instance in the Grande Rue and facing the ramparts, are built of granite. Colour is given by the window flowers, the dresses and uniforms in the street, and the fruit and vegetables in the shops.

So we can make pictures at St. Malo even if we do not care to fill our sketch-books with measured details. And we can do more. We can take in something of the atmosphere of long ago; that is, if we are not too critical, and will allow full play to our imagination. We can pay literary pilgrimages to the birthplaces of Chateaubriand and Lamennais, and, if in a romantic mood, we can meditate over the island tomb of the author of "René." Then, shutting our eyes and ears to the gaiety of Dinard across the water and to the reminders of our own days closer to, we can put out to sea, and there, for a brief moment, can persuade ourselves that we are indeed "looking upon a city as men saw cities in the Middle Ages."

THE ARCHITECTURE OF THE TWENTIETH CENTURY.[*]

BY BANISTER F. FLETCHER.

TO transport oneself into the middle of the next century requires perhaps more imagination than an architect in everyday practice has at his command, but it is interesting and perhaps instructive to try and think out the problems which are likely to harass the architect of the coming century and to picture in our minds how he will solve them. The following remarks are therefore necessarily speculative, because I am breaking away somewhat from the hard facts of the present and dealing with what may come to pass, say, fifty years hence. Our subject is the architecture of the twentieth century.

General Considerations.

Perhaps it will not be unwise to put the question to ourselves, What is architecture? The answer to the question is really that which we shall give as the result of our imagination for the coming century.

Architecture is the result, the record of civilisation, the permanent expression of the people, the great recording angel who writes on indestructible granite the manners and customs, the very lives of the people in whose times such architecture is carried out.

Let there be no mistake in this, that architecture in this respect is as true now as it was in the times of the Egyptians, Assyrians, Greeks, Romans, or Mediævalists. Then as now it records our lives, our civilisation, our mental and social conditions as truly as does any mirror the man who stands before it. It is evident that since the Renaissance the record is more subtle, the pictures are less clear, but that is because our civilisation is more complex and our methods more obtuse. When architecture ate of the tree of knowledge in the fifteenth century, and seized upon the outspread manuscripts and splendid structures of old Rome, she was doing something which until then was an unknown quantity in the world of art. Architecture until that time had been the spontaneous growth, the natural unbidden fruit of a tree planted on various soils, and hence bore varied natural fruit, the result of such planting. In the fifteenth century, however, such a natural cause of growth was abandoned, and architecture, so far as outward form was concerned, went back like a bow unstrung to the ancient forms of classic times. In other words, the revival of the learning of the ancients tended to produce the revival of the forms extant during the period of the Greek and Roman ascendency. And so it must always be. Architecture is made by the people, and *nolens volens* it must bear the impress of the people's mind, although at the time this be difficult to discern.

Placing aside for a moment the new types of structures demanded by succeeding generations of men for their use, let us glance at the ever-recurring question of style in architecture and see if we can picture that style of architecture which will be paramount in the dim and distant future.

Of one thing we may be certain, I think, and that is, whatever style in architecture may be in vogue, Classic, Mediæval or Renaissance, it will be so adapted to the needs of the people that its form will be to all intents and purposes new. We shall be spared the absurd and pedantic Greek temples which were erected as dwelling-houses at the beginning of this century, or later the lath and plaster Gothic palaces which were to transport us back to the Middle Ages. The world is now too matter-of-fact and too much addicted to reviewing buildings from the practical and sanitary point of view to suffer such chicaneries.

Fashions in architecture we shall have, as we have fashions in ladies' attire, or, for that matter, in men's garments; but we can safely predict that convenience in planning will not be sacrificed to outward form, and that the sizes of our floors and windows will not be subordinated to anything but our requirements and convenience. Beyond that we may strain our eyes in vain along the architectural horizon in search of an advance copy of the style which will prevail. And this the more so because we must look unsuccessfully for new forms unless we have new materials which will evolve such forms. It must be remembered that we are using in our architecture the materials that the Romans used; and although the difference is great compared with Roman architecture, yet it is comparatively small when the distance between the one and the other is remembered. It is only by "ringing the changes" on the various architectural forms and features that we can see the future of architectural design. I think it was Lord Eldon who said that architects and lawyers were the most conservative people in the world. Perhaps his lordship did not remember that both Roman law and Roman architecture had reached a perfection of completeness beyond which it was difficult to go, and that therefore what appeared as conservatism was merely the inability to go further. Certain it is that architecture, like language, is a structure built up of certain well-known forms or letters. Now in language it is not necessary to alter the number or names of our letters to produce nineteenth-century literature. Tennyson and Shakespeare use certainly the same letters and also largely the same words, yet one is not a copy of the other. The same in architecture. Because once or twice in the history of architecture there have been revolutions in form, as from Classic to Gothic, and Gothic to Renaissance, people have come to expect what they call a new style in architecture every century or so; but such a thing is unlikely. It is in the putting together of various features that new phases in architectureal art are introduced, and not by wholesale destruction and invention of new ones. To tell the truth, such invention is well-nigh impossible, for if we take such homely instances as a door, a window, or a fireplace, it is impossible to alter much the form of either as long as the size and position of the same remain similar and appropriate.

Thus architectural style will probably not vary much from the Renaissance form at present in vogue for public buildings, or the Gothic for ecclesiastical buildings. But whatever form is current there is no doubt that freedom—almost license—will be paramount. Such is the spirit of the age; thence the architecture will reflect such spirit. We need, I think, expect no more revivals. Architects will be honest in this. The attempt to foist imitations of another century, as in the Greek and Gothic revivals, will probably not recur; but design will travel along the smooth line of careful inventiveness without any revolutionary tendencies. But in any case, as we shall see later on, difference in the needs of the people will produce buildings new in form and outline, if not of necessity largely so in architectural detail.

It is the age of the democracy, and the buildings of importance, such as the libraries, public halls, &c., will tend to show the turn of civilisation in these constructions.

If there is one thing more in evidence and

ST. MALO: THE CATHEDRAL.

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[*] A paper read before the Birmingham Architectural Association on February 8th, 1901.

likely to be so than another it is the complicated and intricate planning which many modern structures require. I shall refer to these later, but it must be apparent that these structures are quite modern in feeling and form, and that little of their character has been seen before. It is true that during the great Roman period of architecture emperors vied with each other in the erection of public baths for the people, but these are isolated instances erected as a bribe to the populace. From the plan of a building is developed its general form; from the junctions of its various parts are evolved its exterior; and as the various types of buildings alter so does the architectural elevation vary with them.

But before I pass on I must refer to the science and profession known as engineering, which, formerly in the architect's province, has now quite dissociated itself from its elder sister. There seems no doubt that to posterity the great engineering structures of the day will appeal as essentially of this century. Such works as the Forth Bridge, the Eiffel Tower, the Tower Bridge, the Brooklyn Bridge, and many others are essentially new in form, born of a new material, steel, which by necessity has evolved forms quite new in the world of design. The number of such works will no doubt be largely increased, and the twentieth century will probably be known as the "Steel Age." It is only to be hoped that the hideous structures perpetrated under the name of engineering will be improved in outward appearance as they could easily be by engineers being trained together with architects in their early studies. In France great engineering structures of this kind are often designed jointly in the manner indicated above, and this has been followed by very encouraging results, as at the Paris Exhibition of 1882. As far as civil architecture is concerned, there is little chance of the use of steel superseding that of other materials.

Steel is not suitable for forming the walls of our houses: it is a conductor of heat, it is used in thin lace-like shapes, and is quite unsuited to keep out heat, cold, or the elements. Hence, although it is sure to be used for large engineering structures or in isolated cases demanded by peculiar conditions, as at Chicago, it is not likely to be a factor in the evolution of architectural forms *per se*. Its increasing use however, to make house roofs of large span will tend to alter interior architecture considerably. Instead of the ponderous wooden roofs erected in the past, a light steel framework, covered with plaster in coffered parts, is likely to be largely used. The lace-work design and construction of the ribs prevents any necessity for tie-rods, and thus gives a new element in architectural design, which should produce a new treatment.

Architecture and Public Health.

It is admitted that architecture consists in the designing of beautiful buildings suitable for the special purpose to which they will be put, and having therefore the essential quality of fitness.

There can be no doubt that the healthy arrangement of buildings has much to do with architecture in its highest sense, and considerations relating to the health of the occupants of buildings affect the form and structure, and therefore the expression, of buildings. In the coming century this will be even more distinctly the case, because there can be no doubt that the principles of sanitary science will be more strenuously sought after and more rigidly applied.

It might be argued that beautiful buildings are not necessary to health, but I maintain that to live among beautiful buildings set in well-designed streets does help to a healthy condition of mind. Paris as a city is perhaps too stereotyed in its architecture, too stiffly set in the framework of her streets; but one never visits it without feeling mentally in a beautiful atmosphere, which is of course sometimes counteracted by the unmistakable signs which seem inseparable from Continental cities—that the system of drainage is not quite perfect.

Environment.

I am stating an admitted truth when I say that environment is a great power, a great factor, in the formation of character and in the general well-being of any community. How can we expect the gutter children of London to grow up as good citizens, as honest, sober and manly, when they pass their lives in the filthy atmosphere of a London slum, with a square of dirty pavement for a playing space, and with a gin palace for a background? We might as well try to get blood from a stone as citizens healthy in mind and body from such a nursery.

Slums are to a certain extent being exterminated; but, if I judge the future aright, we are only at the beginning, and by the middle of the coming century municipalities will have agreed that slums are as dangerous to the community as unhealthy drainage, and that light and air and plentiful sunshine shall find an entrance, as far as possible, into every quarter of our ideal city. What more can we look forward to than beautiful buildings filled with light and suitably built from a sanitary point of view, set on to broad streets so aligned that the sun's rays can penetrate during the greater part of the day?

So much then for the element of fine art in regard to the house proper and its frame, the city beautiful which I contend should be considered in relation to health arrangements.

Further, the architectural conception of life is what we want, the idea of one controlling spirit guiding all others for the common weal and producing works of beauty, forming part of a general progress, the same kind of co-operative labour which resulted in the erection of the Parthenon and the Mediæval cathedrals.

Sanitation.

We may spare a few moments to speculate on the construction of houses in the new century dealing with the subject—(*a*) from the point of view of plan; (*b*) from the point of view of construction; (*c*) materials; (*d*) ventilation; and we may well preface these remarks with a suggestion for the necessity for a Minister of Public Health (assisted by a committee of experts). Such an appointment is necessary in order to codify the enormous amount of literature on the subject and to place the carrying-out of the Acts (if neglected by local authorities) in the hands of those who will not be under local influence, and who will have power to enforce the law. I shall touch upon this later when I come to consider the smoke-abatement nuisance.

(*a*) Sanitation or public health will be the watchword of the new century. Pure air, pure water, pure food, pure soil, clean dwellings and clean bodies will constitute the well-being and strength of a nation.

The more efficient sanitary arrangement and construction of our dwellings has been advancing steadily during recent years, and lectures and treatises galore have been delivered and written on this most important subject—yet how much remains to be done to render our dwellings in a sanitary condition. By the more general teaching of hygiene people may be expected to see more clearly the necessity for a soundly constructed dwelling whereby doctors' bills may be avoided and a more efficient day's work performed by the occupants.

If we consider how often the ills to which flesh is heir are due to badly planned and constructed houses, it does seem startling that any one is entitled to call himself an architect and be responsible for that most important of sciences—the planning of buildings. But this will be referred to later.

The advance in the system of planning buildings has been considerable in recent years, and no longer are houses arranged with the sanitary apartments ventilated on to the staircase or passage. Yet this was a common practice in the past, and there are numerous houses in London on the great landlords' estates where such things exist even now.

(*b*) *Construction.*—In the twentieth century certain anomalies in the construction of houses, it is hoped, will disappear. Amongst the most notable of these are the spaces specially provided by architects for the collection of filth, for the storage and breeding of vermin and the dissemination of disease. I refer in particular to the time-honoured method of constructing the ordinary combustible timber floor. It is useless lecturing on sanitary science while such a harbour for dirt is erected in almost every house. Washing such a floor possibly only makes matters worse, for half of the dirt is washed through the open joists between the floor, and rests contentedly on the laths which support the plaster ceiling below. Our floors must be solid if we would have them healthy. Hollow spaces of all kinds will no doubt be condemned by law in the coming century. Hollow floors, hollow walls, hollow spaces behind skirtings and the like will be things of the past.

Materials.

Since architecture first began to raise herself to the level of fine art, there has been very little change in the materials used in the erection of buildings. Stone, brick, concrete, marble, terra-cotta and wood have been the materials at command, and, although the manner of working them has varied, this has been brought about largely by the social condition of the period. In the twentieth century we can dream of no fresh addition of any material which is likely to revolutionise form. Steel we have already at our disposal, but one can hardly imagine that in works of pure architecture it will ever oust the older materials, although it has almost completely done so in the domain of engineering.

The use of wood in buildings seems likely to be less and less adopted in interior fittings, and it is doubtful whether many good substitutes for it may not be found, especially in such parts of a building as *floors*. This is foreshadowed for us in the construction of modern hospitals, where the floors are in most instances made of some non-absorbent material of a concrete nature, which can be thoroughly cleansed. In some modern buildings which are not hospitals this method has been adopted. In the Great Central Hotel, London, there is no wood used except for doors and windows, and there is really no reason why any architectual features except doors should be in wood. In the hotel mentioned the floors are of steel joists and concrete, the upper surface covered with mosaic, and the skirtings, which in most houses are of wood, are of cement, instead of the objectionable wooden skirting behind which are the usual dirt-traps. It does not seem that expense stands much in the way of the adoption of solid concrete floors, and the latest decision of the London County Council permitting fireproof floors to be constructed of fir joists and concrete has much reduced the cost of such work. One element of inflammability is therefore done away with, besides placing the building in a much better sanitary condition.

For all buildings the tendency is to cultivate the use of fire-resisting construction, and there can be no doubt that this will be greatly extended in the future.

Ventilation.

Ventilation, in general, will no doubt proceed on lines of general advancement, but except in public buildings nothing that could be called mechanical ventilation will be attempted, the expense of such systems being too great. In theatres, music halls, public assembly halls, churches, &c., it may be confidently asserted that great improvements in the proper provision of pure air will be effected.

It certainly does seem a curious thing that although the science of ventilation has passed the preliminary stages, and may now be said to be an exact science, yet the amount of air necessary to be pumped into our meeting halls and churches is not regulated by any Act of Parliament.

It would therefore appear that the Legislature does not believe fresh air to be a necessity to existence, or even to good health, although it may be observed that the Houses of Parliament are probably the best ventilated buildings in the land. Our Building Acts and Public Health Acts regulate the construction of buildings and provide in special cases for a certain amount of cubic space per person, but as regards the ventilation of public meeting halls they are practically inoperative. The improvement which may be expected to accrue to the health of the community at large by breathing fresh air, properly warmed and admitted without draught, when crowded together in large numbers is not to be over-estimated.

It is certain that such provisions cannot be much longer omitted from the Public Health Acts, and the present disgraceful condition of our public meeting halls will then be altered for the better. We have been termed "a nation of shopkeepers"; but I think a more appropriate term, at least during a certain proportion of the day, would be a "nation of lookers on"; and I am bound to say that I think this national characteristic—which, be it said, we hold in common with other nations—will extend. The increase in the numbers of theatres, music halls and concert halls which will be erected to supply this demand will probably be very large, and even the small provincial towns may be expected to be provided with such buildings, properly ventilated according to the latest sanitary knowledge.

Garden Cities.

The city beautiful. Is there in the whole of Great Britain a city which might be called beautiful? Some approach beauty, but there are foul blots in most; slums, badly-constructed tenements and insanitary factories, which spoil the picture. What can we say of the heavy pall of thick black smoke which hangs over London, and to a much greater extent over the manufacturing towns of Northern Britain? Is that a subject of gratification to our municipalities or a matter affecting the public health which should not be remedied? I believe I am right in saying that laws do exist which prohibit these monster belching chimneys from fouling God's air and blackening the earth, but that these laws, from local influences, are often not put into force. The open fireplace it will always be difficult to dispense with, owing to associations connected with the domestic hearth; but important improvements in its construction are already shadowed relating to smoke consumption which will no doubt be enforced on all householders. Personally, however, I am inclined to think that gas will supersede coal for warming the ordinary buildings.

Let us glance at London—London the great, the picturesque and far from ugly capital of the Empire.

Roof Spaces.

In the first quarter of the new century when London, with the assistance of legislative action, may be expected to have shaken itself clear of its smoky curtain, and to have removed a large number of its most offensive factories to a convenient distance into the country, the idea of overhead promenades formed upon flat roofs will probably be brought to the front and found to be practicable. The roof promenade may, in fact, be a feature of the next century, and we shall perhaps return to the usage of the Egyptians and other Eastern peoples. These roof spaces, adequately protected, could be more generally utilised as playgrounds, flower gardens, for tennis and sports generally, or even, as in Chicago to-day, as a space where shops could be erected. If imagination does not desert us, we might conceive a football match on such spaces, with the attendant thousands of spectators. Such roof gardens would have this advantage, that in the summer when fires are not needed for heating purposes, and when cooking will be effected by electricity, the air would be quite free from smoke: they would be more conveniently used. "Afternoon tea" on the roof will probably be the invitation of the future, and with the above suggestion a substitute would be found for a terrestrial garden. Public health would be benefited thereby, for the cool breezes generally obtainable at the height of a five-storey house with a view from the Highgate heights to the Surrey hills would be a blessing to the jaded office worker. I only mention this as showing the possible effect of public health problems on architecture, because the advantages of level roofs are admitted, and it is possible that when the way is cleared by a better atmosphere the great cities, owing to value of land and increase of population, will wake to the advantages which they now miss, and a third London will appear on the house-tops, as there is already a second beneath the surface.

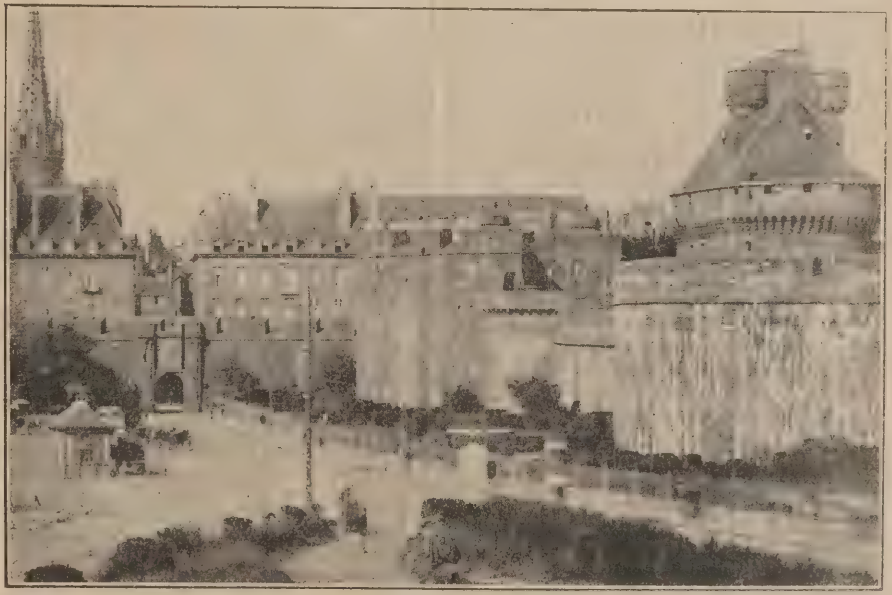
Time will not allow me to pursue further the fascinating subject of the future city; we must pass on.

Domestic Architecture.

In approaching domestic architecture one is met on all sides with so many "ifs" that the difficulty is to proceed at all. What is to be the civilisation of the next century? Is it to be socialistic—the levelling of the rich—or is it to proceed on the lines of the present day? Will the people rush from the towns to the country, or *vice versâ*? It is plain that the railway, the cycle, the electric tramway and the new "flying machines" will quite as much tend to throw the people out of, as into, the great cities. It would certainly seem that with improved methods of communication there will be a tendency to live out of towns and work in them—for those at least who are able.

It is considered now somewhat a feat to live at Brighton with one's business in London; but we may take it that such a thing will be quite common, and that by the middle of the century a man may possibly go much longer distances. Domestic architecture will be governed very much by the course which easy transit develops, and such being the case the health of the community will no doubt be improved by the placing of people over a wider area of ground.

But besides easy transit, telephonic communication and the new science of writing by wire known as the telautograph will have an important effect on the distribution of population, and hence on the health of the community, and it is not unlikely that the trend of events will enable us to carry on our practices "far from the madding crowd." As an instance I call to mind how some years ago in the United States I visited a village ten miles from Boston, where the most celebrated landscape gardener in the United States lived, and where he worked with his assistants on his designs.



ST. MALO: SQUARE AND PORTE ST. VINCENT.

Being in telephonic communication with Boston, and thence with other centres of population, he and his staff had the advantage of being in direct communication with his clients and at the same time of living in the country, with all the advantages of fresh air and congenial surroundings—an environment which we must admit is conducive to the production of the best work. Such is an ideal state for an architect, and it needs no great stretch of the imagination to conceive its possibility. But even if we must work in cities, it is certain that, with improved means of communication, the dwelling-house will be the better for being removed from the environs of the city.

If there is one class of building which has improved in design and construction during the last fifty years it is the smaller house of the suburbs and provinces. It is true that streets of houses are still erected in the suburbs by speculating builders, but it is possibly a hopeful sign of the times that whereas formerly such houses had no pretence to be designed in a sanitary manner, yet now in many instances they are so designed, and an endeavour is also made to give them a pleasing architectural exterior, which is, of course, very seldom successful—still the attempt is encouraging. The drainage and sanitary fittings are now boldly advertised and placarded, even to the great luxury of one bath, with hot and cold water. Other alluring enticements are held out to the future occupier. In one house on the outskirts of London which I recently had occasion to visit a plan of the drains, engraved in red lines on a brass plate, was prominently fixed to the wall by the kitchen dresser. It is needless to say that after such a display of careful sanitary forethought the house was immediately sold, and I give the suggestion to anybody with a house unlet on his hands as a prescription by means of which the desired result may be attained. It is, moreover, a hopeful sign of the times.

Although long unlovely streets of dwelling-houses are still erected, all cast in one mould, and people are obliged to live in them, there is a decided move towards a desire to live in a house with some character about it which shall differentiate it from its neighbours. Will this tendency increase and will such houses multiply, or will the desire die out?

I must be permitted a few words on this important subject, because I really think it is connected with the idea of public health in its widest sense. A house which is to be a home should be made to suit the occupant in the same way as his clothes are, or should be made to fit him. A man should not, if he can help it, stuff himself into any house haphazard. The growth of individualism in taste is certainly manifest, and the greater interest taken in ordinary art matters by the coming generations will possibly not be lessened. But although the country dwelling-house will possibly increase to a considerable extent, yet there must always be a considerable number of dwellers in cities, and their lot in the garden cities already foreshadowed should be of comfortable character.

Where will they live, and how?

The twentieth-century "flat" will be a creation of its own; something to make the lonely bachelor of to-day sigh for. Everything will be able to be "turned on." I do not know how long we have been able to turn on water in our houses, but it must have been considered an immense advance in sanitary science and must have done much towards the attainment of that personal cleanliness which has been considered by some experts as next to godliness. Besides turning on water for washing, gas for heating, electricity for lighting, the liver in the flat will press a button for breakfast, lunch, or dinner, and somebody will do the rest, *i.e.*, will supply it.

By the pressure of another button the "babbling machines," described in "When the Sleeper Wakes," will be turned on and will tell the worker while he eats his breakfast the morning news, supplied from headquarters. People will be too busy to read newspapers in the coming days.

The life in a flat will be socialistic, yet exclusive, for although the *ménage* will probably be undertaken by one person for the benefit of many, yet the result will be available privately. This life is already shadowed forth in the United States and in London, and there seems no reason to doubt that it will become very general among the class of people who will inhabit such buildings.

The great domestic-servant problem is going to account for a good many things in the coming century; amongst others we may expect the multiplication of fittings, such as lavatory basins with hot and cold water in each bedroom, the use of gas fires for heating, the more sanitary arrangement of servants' quarters.

In how many houses of even fairly good size are there servants' bathrooms? Yet surely our successors will look back upon such a state of things with wonder.

The Working Classes.

We often used to hear about "better days for the working people," and no doubt better days have come. The Rowton houses, the County Council lodging-houses, and the immense blocks of flats already erected in London are but the precursors of other big schemes which will certainly be pressed forward as population increases. This is, perhaps, one of the greatest public health problems we have to face. It is, moreover, so wrapped up in our commercial system that much will depend on the way that manufacturers regard it.

Will the factories be removed to the country, or will they to a large extent remain in the towns? Personally I am inclined to think that a large proportion will go to the country, and that only a few will from their nature probably remain in the towns.

Let us picture

The Country Factory.

The country factory with the cottages for the employés is an excellent idea, and one likely to give the best results to employer and employés.

The employer will construct his factory on land comparatively cheap, and by providing his workmen with house accommodation, also at a low rent, will have at his disposal a contented community, living largely in the fresh air who, being under healthy conditions, will give better results than the town worker, crowded into compartments necessarily small because of the value of city land. The growing families will also have the inestimable advantages of fresh air and country life. Some of the large manufacturers of the North have already tried this plan with good results, such as Messrs. Hartley, Lever and Cadbury, and new villages with the latest sanitary improvements both in the planning of the cottages and in the abundance of light and air and tasteful surroundings have sprung up.

If such schemes should prosper we may look forward in the new century to a return of the people to the country, whence of late years there has been such an exodus, and the improved means of rapid communication already foreshadowed will assuredly assist in such a return.

Peoples' Palaces.

On the other hand, if the study of economics should compel the abolition of the present wasteful system of living—the multiplication of fires for warmth and cooking, the waste of service, the extravagance of buying food in small quantities—then it is possible that the erection of country palaces for the people on socialistic principles will be promoted. Such palaces, with proper equipment, could supply all the needs of the community as to food, service, &c., at probably a quarter the cost of the individualistic cottage treatment.

Each palace would be contained in its own park, with lakes, playing grounds, &c.

Such a building—a real peoples' palace, a twentieth-century homestead—may be beautiful, although in the minds of many not so picturesque as the simple thatched cottages of our forefathers.

At any rate, the old dark and damp cottages of the present period, devoid of a proper water-supply, will soon sink on their rotten foundations; the educated working classes of the future, who will know the evil effects of damp, will refuse to live in them, and they will be replaced by structures, dry, well-planned and lighted, with proper water-supply and drainage and healthily constructed in all particulars.

The old picturesque "lichen covered" thatched cottages which we eagerly pounce on for our water-colour sketches are, we may rest assured, more pleasant to sketch from the outside than they are to live in.

Before returning to the town-dweller we must spare a moment to discuss the scarcity of rural cottages which at present exists. It is a feature of this period, and the reason is that it is almost impossible to erect cottages which will pay a fair percentage on the outlay. That being so it becomes a question whether some such scheme of communistic living, as hinted above, will not be the outcome of this state of things.

I believe such scarcity is partly due to the present building regulations, which for this class of buildings are unnecessarily stringent. There is no reason why country cottages with proper brick foundations and damp-courses should not be built of wood in the upper part and made perfectly sanitary constructions; it is the usual way of building even large country houses in the United States.

Workers in Town.

But a large proportion of workers must always live in towns; the needs of town life demand it. There is, however, a good deal to be said against these huge blocks of barrack-like buildings which have lately housed so many persons on a limited area, even if the sanitary arrangements are perfect.

The absence of sunshine and fresh air is bad not only for children but also for older people, to whom also a multitude of steps is specially objectionable. The absence of light and air in the lower floors of these huge blocks of flats is especially to be remarked.

Municipal Architecture.

Let us look at a few types of structure which concern themselves somewhat less with the public health and speculate in what way they are likely to be influenced by the progress of civilisation.

The development of municipal architecture will depend, of course, on the view the masses take of their citizenship, and whether they will regard the emulation of the architecture of rival towns as falling within the scope of citizenship. In the past ages such has been the case. From the Hellenic period of Greek civilisation, through that of Augustus, and the Middle Ages, and in the great Renaissance movement of Italy in the fifteenth century, the emulation between rival cities has been the means of producing buildings of the first importance. In our own day the town halls of Glasgow, Liverpool, Manchester, Oxford, Colchester, Sheffield and other large towns have risen in evidence of this feeling, and as if to point the way to the importance of architecture as an exponent of the cities' progress. The stately town, the emblem or visible sign of the harmonious life of the twentieth-century citizen, will be the product of the moral forces of which sanitary science is not the least important.

Municipal buildings are worthy records of a city's greatness, and as the country population appears to be steadily drifting towards the towns, thus increasing their numbers and wealth, the new century may possibly be productive of this result. But whereas in the Middle Ages in England the principal building rivalry often lay between cathedrals, in the twentieth century it will probably be more of a secular rivalry between cities.

As regards theatres, we may expect a great revival of building, which has moreover already commenced. The love of music and the drama is assuredly on the increase and will continue to grow. The late John Addington Symonds, the distinguished critic on the Italian Renaissance, said that music was the only true modern art, the only art which seemed to appeal to the senses in a modern way.

Certain it is that the public generally take a far greater interest in music than in architecture, painting and sculpture. As municipalities expand and increase in wealth, provincial theatres and concert halls will rapidly increase.

In this respect, the piecemeal decoration of the Royal Exchange in London is an example of how not to do it. Instead of the decoration of such an important building being competed for by the best fresco artists of the period, and the prize awarded to the finest conception as a whole, isolated pictures are selected from time to time by eminent artists, the result being a want of continuity of scheme and design, which is unfortunate in its results, instead of the whole series of frescoes forming a continuous picture of English or (say) London history in one general comprehensive scheme.

There is, or should be, an intimate relation between architecture and national life.

Picture Galleries, Museums, Public Libraries,

will become a *sine quâ non* in every provincial town, and in many cases will form part of a group around the town hall, the building symbolic of the executive who will direct the formation of and undertake the custody of such collections.

In London, the "city of cities," the division into separate municipalities will, it may be hoped, engender a broader municipal spirit, so lacking under the old vestry system, and so lead to the erection of appropriate municipal structures worthy of the importance of each, as representing a city in itself.

Public baths and washhouses will be considered as necessary to every town or district as a system of drainage, and our grandchildren will look back with horror at the insanitary nineteenth century in which, although lecturers were continually priding themselves on the advance in sanitary science, local authorities were not compelled to provide facilities for the furtherance of public health.

Properly constructed abattoirs, provided with the efficient sanitary precautions in the slaughter of animals for the purposes of food, will undoubtedly be entirely under municipal management, as in Paris and other large continental cities.

The most significant constructions of the new century will possibly be the monster towering hotels, of which in London we have but seen the commencement. Such will be the expression of the touring, travelling and luxurious twentieth century, the age of big cities, art pilgrimages and personally-conducted parties, the age of the sightseer and the "looker on," the age in which people will feast upon the glories of the past, live in the future, and exist by way of contrast in the present.

Asylums, police stations, fire stations, waterworks, electric works, tramway works, board schools, poor houses and hospitals, all of which are the outcome of our modern social condition, will increase a thousand-fold.

The greater the science of public health is studied and applied, the greater however the chance of the "weaklings" pulling through, and being a charge on the public purse.

The strain of living will increase the number of lunacy cases to an unparalleled extent, necessitating considerable additional hospital accommodation for neurotic diseases.

People will talk of the good old days of the nineteenth century and will fondly believe they would have been happier now than then, and perhaps they would be right.

Within the region of purely monumental architecture can we expect much? Possibly not! The monuments of the twentieth century will be ranked as works of utility.

The great railway stations, properly planned for ingress, egress and the health and comfort of the community, will take the place of the present cramped enclosures.

When in, say, 1925 the "flying machine" shall have been perfected, it may necessitate a reversion to the huge platforms about 50ft. in height and several thousand square yards in area in use in Babylonia 2,000 B.C., and on which the temples and palaces were placed.

Such raised platforms will be required as resting-places for the twentieth-century flying machine; these elevated platforms being reached by lifts continuously moving.

Such platforms will be constructed of steel; the best prototype I can give you being the half-finished Wembley Tower, near London.

In the great constructive science, the bridges of the future will probably be of astounding dimensions, and the new Brooklyn Bridge may be regarded as a forerunner of many which will far surpass it. To bridge from Calais to Dover, and even from London to New York is a far from unlikely occurrence. And yet the thought comes, shall we do without bridges, shall we, with the aid of flying machines, fly to New York, fly everywhere and anywhere? In such cases we may possibly require resting-places at stages in the Atlantic for the lubrication of the monster wings of the flying machine, such resting-places taking the form of the monster steel platforms of the Wembley Tower type, already mentioned.

Am I romancing without reason? It may be so, yet it is not possible for anyone to say these things will not happen. If we look at the strides in every science which have been made in the past century we must feel that if the present is to proceed in a like ratio, not only the things I have sketched for you, but much more also, will come to pass.

A Twentieth-Century Architect.

And if this is a correct view of the architecture of the coming century, what of the architects; of the creators of such work? If architecture in its outward forms has not advanced by any revolutionary stages along the highway of progress, yet in the manner of construction she has and will develop exceedingly. Old Philbert de L'Orme, an architect of the French Renaissance, once said that an architect should have four eyes, four ears and three hands; and if it was necessary then, what now?

An architect nowadays is necessarily skilled in mechanics, several sciences, and in various arts connected with architecture.

Now architecture differs from engineering in one essential quality, that while the latter is a matter of common sense, which everyone understands and therefore can appreciate, the former in its highest stages is based on an appreciation of æsthetic quality which the public can scarcely be expected to understand.

The new century will be a utilitarian and scientific age essentially, and architects will have to adapt themselves more to the requirements of the time and hold less to the antiquated ideals of the past centuries if they are to capture and retain the public interest.

We must be of the twentieth century if we would succeed in it. Therein lies our great difficulty, prevalent in no other profession, for architecture is an art, science and profession.

In architecture we have the artistic requirements sadly hampered by the material needs, and above, dominating those, the professional qualification requiring us as men of business above all things to protect our clients' interests.

The question of architectural education therefore is an important one. The foundation of the Royal Institute of British Architects and the Architectural Association in this century, and the institution of professional examinations, are merely the reflection of the spirit of the age, in which the public require to have some indication that the men they employ are capable, and, in fact, that they are qualified to practise their profession.

This will undoubtedly lead to a compulsory registration for architects, when no one will be allowed to practise without a diploma. To the public it is a never-ending theme of amazement that anybody can call himself an architect.

And truly it is quaint. We cause the men we direct on our buildings to be registered—we have our registered plumbers, our carpenters, bricklayers, joiners, plasterers and masons who have all served their apprenticeship, besides being technically educated, and yet anybody can call himself, and practise as, an architect.

Let us think for a moment of the power for good or evil in an architect's hands, due to his knowledge or ignorance in matters connected with building, and then who can doubt but that this compulsory registration is bound to come.

Opposition has always been forthcoming in these matters. In the law, in surgery, and in medicine, the same well-worn statements have been flung back to those who have advocated progress, and generally this opposition comes from the older men, the relics of a past age, who can see no good in change of any kind.

The only real difficulty is the question of the possibility of examining in art, and as far as the public goes it would not matter if art were left out of the question, for in nine cases out of ten the public employ us to protect their interests, and not to provide them with artistic work about which they know little and care less. The principal thing to remember is that the public expect us to be thoroughly qualified all round, to be directors and experts of all departments of building, and to possess the business qualifications for guarding their interests which are usually associated with the profession of the law.

If a profession or a calling which is employed by the public is to continue to exist there must be confidence by the public, and how are the public to know with certainty the qualified from the unqualified unless some official qualification is available?

Again, a great part of the architect's ordinary practice consists in utilitarian work which requires no artistic talent, but which does require great scientific and practical knowledge and business habits.

We have elsewhere hinted that the guiding star of the next century will be sanitation, matters of drainage, and everything connected with the hygiene of the house with which architects are concerned, and they will no doubt be properly registered to deal with such work.

If persisted in, the present fine-art theory of architecture, held by a few eminent architects who have clients enough to support their fancy, will tend to the gradual absorption of legitimate architectural work by builders or big firms of decorators, who probably will employ a "tame" designer to put a frontal to their stock plans.

In regard to the increasing complexity of our civilisation, the number, extent and intricacy of new types of constructions, it may also be expected that the tendency to specialise will develop itself, although the general practitioner will, of course, continue to hold his place as in the other learned professions.

Such are a few of the thoughts which I have been able to put together dealing with the future of architecture, and although they are far short of what I had hoped to produce, yet in the time at my disposal I have found it impossible to go more deeply into the subject, but hope that I may, at least, have made suggestions upon which a discussion may be profitable.

Builders' Notes.

The Edinburgh and Leith Master Builders' Association held its annual meeting last week, when Mr. Robert Lamb, Logie Green, was appointed president for the ensuing year in place of Mr. James Miller, who retires.

Mr. William Thomas Flavell, of Horsemarket, Northampton, died last week at the age of forty-six years. He was by trade a plasterer, and was for many years a well-known and respected tradesman of Kingsthorpe. Besides the plastering work he took up building.

The Portsmouth Master Builders' Association held its annual meeting recently, Mr. A. E. Porter, T.C., presiding. Mr. W. J. Light was elected chairman for the ensuing year. Mr. W. H. Evans was elected vice-chairman, Mr. H. Jones, treasurer, and the following committee was appointed: Mr. C. Dye, T.C., Mr. A. E. Porter, T.C., Mr James Crockerell, Mr. J. W. Perkins, Mr. H. E. Wilkins and Mr. G. R. Chamberlain. Messrs. S. Lillington and E. Bradshaw were elected auditors, and Mr. F. W. Simpson was re-elected secretary.

Building Operations at Sunderland.—According to a report that has been prepared by the Building Committee of the Sunderland Corporation, 352 plans for buildings of all descriptions were submitted during the past year. Of these 314 were approved and 38 disapproved. The plans that were approved included 143 for new houses, and these represented 658 houses. Cottages of one storey continue to be by far the most common style of dwellings erected at Sunderland, for it appears that the 658 houses were divided as follows:—334 one storey, 158 one storey and a half, and 166 two or more storeys.

Building Materials in Peru.—The system of building in vogue in Peru will be considerably modified shortly for sanitary reasons, and in view of the frequent earthquakes. Cement is of primary importance—a remark which also applies to iron shells for two-storied houses with double walls of sidero-cement, ordinary bricks, or compressed sand. Under these conditions this market will require prompt supplies of cement, iron girders for uprights and top-beams, iron for use instead of binding joints, &c. The employment of these will necessitate the use of screw-bolts, hand drills, shears, sledge hammers, &c.

Municipal Housing in Sheffield.—Ten of the cottages in Hands Lane are ready for occupation, and five more will be ready shortly. The cost of cottages, including land, erection, street works, and incidental expenses, will be approximately as follows:—

	Estimate.	Approximate total cost.
	£ s. d.	£ s. d.
Land		714 12 0
Contract work	1,856 15 4	2,020 14 6
Increased (through contractors having declined to carry out tenders) to	2,020 14 6	
Building work, &c., done by Highway Department	2,760 0 0	2,751 5 7
Printing, clerk of works' wages, street works, &c.		306 18 2
		£5,793 10 3

The rental of the cottages is to be fixed at 6s. 6d. per week each.

Cement Trade Difficulties.—In July last an agreement was made under which the principal London cement merchants agreed, upon certain arranged terms, to take their whole requirements of cement from the Associated Portland Cement Manufacturers, Limited. After the agreement had been in operation about six months, the latter gave the merchants notice that they were advised that the agreement was not enforceable. The merchants took counsel's opinion, which laid down that the agreement was enforceable, but the merchants, after considering the difficulties in their way, and the "critical and disorganised state" of the cement trade in London, decided not to enforce their contention. Consequently they have agreed, under protest, to the agreement being cancelled. There is considerable feeling in the trade on the subject; and Mr G. E. Wragge, chairman of the Associated Cement Merchants of London, 47 Belvedere Road, S.E., complains that "this agreement, which was drafted entirely by the manufacturers, and which at any rate was distinctly the understanding upon which the merchants were to be supplied with their cement should now be repudiated by the manufacturers."

London County Council.—At last week's meeting of the Council Mr. Samuel George Burgess, secretary and manager to the Middle Class Dwellings Company, Rowton Houses, Limited, and Wharncliffe Dwellings Company, Limited, was appointed manager of the Housing Department at a salary of £800. Mr. John Hall Rider, the chief consulting and resident engineer for electric tramways and electric lighting under the Plymouth Corporation, was appointed electrical engineer to the Council at a salary of £1,000 a year. Mr. Goulding, M.P., drew attention to a decision of the Housing Committee to hand over to contractors the work of constructing some dwellings for the working classes, instead of giving the works manager the option of erection. He remarked that already contractors had saved the Council £14 000 on dwellings as compared with the amount which the Works Department required for the work. Mr. Alderman Dew said the reason why the contractors could do work cheaper was that they had more freedom. In one case a contractor had his joinery done in Plymouth by boy labour, and a lot of it was condemned. It was patched up, however, and used. The maintenance cost of such work would be very heavy in the future.

Bricks and Mortar.

APHORISM FOR THE WEEK.

There is this difference between the products of the artist and of the craftsman: the artist produces what he himself finds good, the craftsman what is profitable. Phidias, for instance, finished his work with the greatest care, even though he did not sell it.—SENECA.

Our Plates. THE house by Mr. C. F. A. Voysey at Fernhurst, Sussex, is for a Mrs. Chester, and is now being built by Mr. F. Müntzer, of 16 Dover Street, Piccadilly, and Godalming. It is to be brick, cement rough-cast, with local stone terrace walls and steps, and local red-tile roofs. The hall and staircase will be entirely lined with oak, and the floor will be paved with slabs of Portland. Electric light will be provided by the engine that pumps the water. The windows will have Bath stone dressings and iron casements. The site is so steep that the bedroom floor is only 9in. above the upper terrace, the hall only 9in. above the entrance court, and the heating chamber and tool-room only 6in. above the lower terrace. The hall is open to the level of the ceiling of the bedrooms with an outlook from the landing and the parlour into it. The view from all the windows is most charming.

The Cloisters of Battle Abbey. THESE cloisters are among the most interesting parts now remaining of Battle Abbey. There is only one side left of the cloister garth, and the majority of the work is Perpendicular, of uninteresting character and much restored. The example published is, on the contrary, entirely untouched by the restorer, and is in almost perfect condition. It is executed in Caen stone, and dates about 1171, when Abbott Walter de Lucy rebuilt the cloisters. The small door shown is comparatively modern and gives entrance to part of the vaulted substructure of the dormitory known as "The Beggars' Hall." The window is, of course, also modern. All the mouldings are worked on the main wall of the building, being the inner side of the cloister aisle, and the springers of the stone vaulting are still in good condition. The carving of the caps and brackets is refined and quite Early English in feeling; unfortunately the concave stone of the circle has quite lost its enrichment, but the cuspings are good and well-preserved.

Winchelsea Church. WINCHELSEA Church is a fine "Decorated" building and was built between 1288-92, the choir, chancel and ruined transepts being all that now remain of what was once a very large church. The south aisle of the choir is the most interesting part of the church, and is called Alard's Charity, since it contains the elaborate canopied tombs of Gervase and Stephen Alard, and, in connection with them, the piscina and sedilia which we illustrate. These are in close proximity to the tombs and formed part of the same design. The carving has unfortunately lost much of its original sharpness, and the canopies have all had the tops (with one exception) broken off. These were not finished with finials as is most usual, but the sharp edge was left just running up. The Church contains altogether five monuments, two sedilia and piscinæ, and an aumbry; it has also a very beautiful choir arcade of lofty arches, supported on banded shafts of Caen stone and Sussex marble, besides some excellent windows. Our illustrations of the piscina and sedilia in this church, and also of the cloisters at Battle Abbey, are by Mr. Herbert Hall.

Ancient Ruins of Rhodesia. THE ancient ruins of Rhodesia form the subject of an article in the Christmas number of the "Buluwayo Chronicle." At the outset the authors refer to the romance of that deeply interesting land, and then go on to discuss the hundreds of ancient temple-forts scattered throughout its borders. All these temple-forts or Zimbabwes are in ruins. The altars are broken down, the orientated shrines once sacred to the votive worship of sun, moon and planets and the forces of Nature have become desecrated, and "the snake and owl inhabit there," while the very images of the gods have gone. No more the priestesses of Venus ascend to the summit of the sacred cones in these Rhodesian temples, which are all "open to the light of heaven," there 'mid pious orgies to acclaim the rising of the Queen of the Early Morning. These Phallic worshippers have gone, like the people of the ancient Aztec kingdom, the people who built the round towers of Ireland, the pagan temples in Scotland, reared the "cloven stones," and set up the "sacred circles" in England, as at Stonehenge, and scattered thousands of their monoliths and temples all over the world. The ruins, however, remain. One of the greatest of the circles, solidly built of well-cut granite sets, is of 280ft. diameter, the greatest height being 35ft. and the greatest base thickness 16ft. Around this vast structure lies a perfect labyrinth of ruins of a remarkable character. Experts derive from the orientation of the remains a date of about 1100 B.C. The authors of the article in question discuss the race who erected these wonderful remains, and give facts which incline them to the belief that they were of Sabæo-Arabian origin, and that Rhodesia was no other than the ancient Ophir associated with the glories of Hiram and of Solomon.

Bristol Infirmary Competition: Result. THE Special Committee of the Bristol Board of Guardians have issued their report in regard to the competition for a new infirmary. Fourteen architects were invited last May to compete, and seven sets of designs were received. Mr. Keith D. Young was the assessor, nominated by the president of the R.I.B.A. His fee was one hundred and fifty guineas. Mr. Young's award is as follows:—1st premium, £200 (design E), Mr. H. Percy Adams, of 28 Woburn Place, Russell Square, London, W.C.; 2nd premium, £150 (design A), Messrs. Giles, Gough and Trollope, of 28 Craven Street, Charing Cross, London, W.C.; 3rd premium, £100 (design B), Mr. Arthur Marshall, of King Street, Nottingham. The approximate estimate of Mr. Adams for the whole of the building, which will contain 852 patients' beds, accommodation for the medical and nursing staff and general administrative work, is £123,383, but the assessor intimates that in his opinion the cost will more nearly approach the sum of £153,796, although the price at which he has made his estimate is considered by the committee to be in excess of what the work can be done for at Bristol.

Victorian Art. "IN the whole history of British art," says the "Globe," "there is scarcely any period which can compare in importance with that covered by the reign of Queen Victoria. It must always be famous as a time of extraordinary progress and unprecedented development. From the Victorian era will, indeed, date the commencement of many great movements, the fruits of which will be enjoyed by generations as yet unborn. We are witnessing now the first stages of more than one undertaking that will affect in years to come the artistic activity of the world, and we are beginning to realise what is the significance of the events in which we are taking part. . . . It is only necessary to examine the condition of any branch of our art in the early Victorian days to appreciate what has been the progress that must be recorded during the Queen's reign. In painting and sculpture we have risen from a state of laughable incapacity to honourable rivalry with the best that any other country can show; and in the decorative arts we have become almost the arbiters of taste for the rest of Europe. British fashions in design provide the standards against which other nations measure their productions, and our designers receive the flattery of imitation all over the world. Yet we are far from having reached the limit to which we can hope to attain. Only the foundations of what is to come have been laid in Victorian art; but they have been laid soundly and securely, and the superstructure that will be raised upon them will be vast and monumental."

Architectural Registration in America. A CONVENTION of practising architects was recently held at the rooms of the Architectural League in New York, and the draft of a Bill to require persons practising as professional architects to pass an examination and be registered was discussed. A protest was read from the New York Chapter of the American Institute of Architects, and the Bill was finally referred to a committee of one hundred for further revision and presentation to the Legislature. The Bill provides that within sixty days after its passage the Governor shall appoint nine persons to constitute the New York State Board of Architects; the members of the board to serve without remuneration for their services, but to be reimbursed for their legitimate travelling and other expenses. The State Board may adopt, with the approval of the Governor, rules and regulations for the examination and registration of applicants for registration to practise architecture, the fee for which shall be at least $20 (£4 2s.). If the examination of any applicant is satisfactory to a majority of the board a certificate will be issued to him on the payment of an additional fee of $13 (£2 14s.), entitling him to practise. A person who, at the time of the passing of this Act, is engaged in practice shall be entitled to registration without fee or examination on the presentation of a satisfactory affidavit to that effect.

Forum Discoveries: Arch of Tiberius. ANOTHER important discovery has been made in the Roman Forum. In front of the Temple of Saturn, between the Rostra and the Basilica Giulia, Signor Boni has found a large platform of concrete with marks of a massive construction which formerly stood upon it. These marks have been recognised as those of the arch of Tiberius, which was of the same dimensions as the arch of Septimus Severus, and which stood in a line with the arch of Augustus. The position of the foundations corresponds exactly to the position assigned to the arch of Tiberius in the bas-relief on the arch of Constantine. Traces of these foundations were first discovered last November, but could not be with certainty identified until now. The arch of Tiberius was erected in the year 16 of the present era in order to celebrate the recuperation by Germanicus of the eagles lost by Varus when the three Roman Legions were destroyed by the Germans under Arminius.

Mediæval Castles of Wales. PROFESSOR LITTLE gave a lecture last week at Cardiff University College on the castles of Wales of the eleventh and fourteenth centuries. To illustrate his remarks, the lecturer dealt in detail with Cardiff and Caerphilly castles, showing what part each took in connection with the system of defence and government of the country. Until the end of the eleventh century, he said, there were comparatively few stone castles in the whole of Europe. Probably the first Cardiff Castle was a wooden structure erected upon an artificial mound, surrounded by palisades and a moat. This was within the mounds that had once protected the Roman camp. The probable site was the place on which the old "keep" now stood. The present "keep" was erected about the twelfth century, and it was probably in this "keep" that Robert of Normandy was confined, and not in the Black Tower as pointed out to visitors, which could hardly have been built at the time. He afterwards referred to the construction of the remainder of the castle, and to the raid of Ivor Bach, which resulted in a further modification of the defences. The dwelling-houses in the castle at that time probably occupied the site of the present buildings abutting on the west wall. After some reference to the customs and government of the period, he entered upon a lengthy description of Caerphilly Castle, which, he said, was one of the best examples of the concentric system of defence. The castle was built upon a mound of gravel, partly natural and partly artificial, which by artificial means was surrounded by water so as to form an island in a kind of lake. The eastern side was one of the most imposing pieces of military architecture known.

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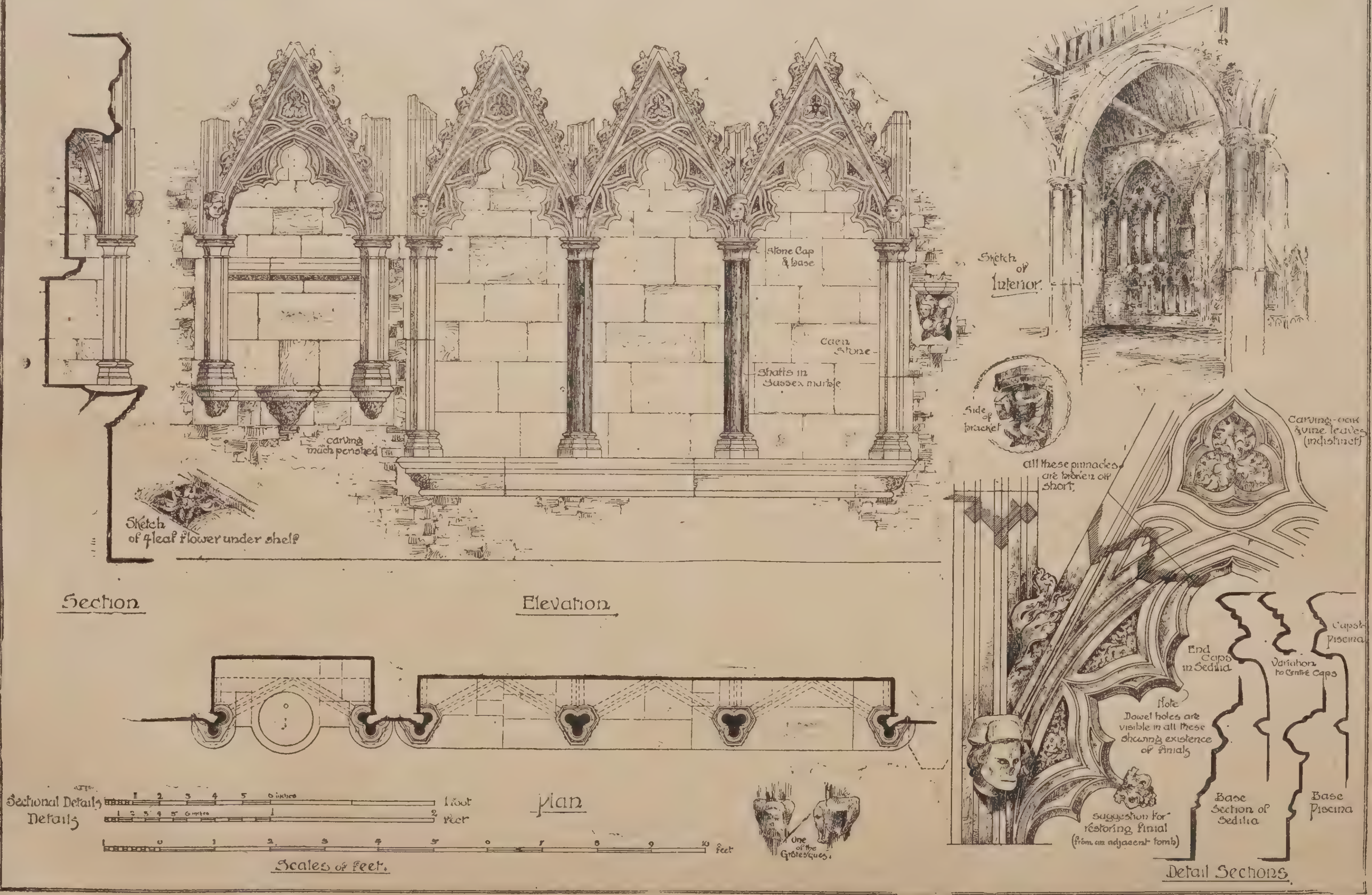
Winchelsea Church : Sussex

AD 1280–1292.

Piscina & Sedilia in South Aisle of Choir



Measured and Drawn by HERBERT HALL.

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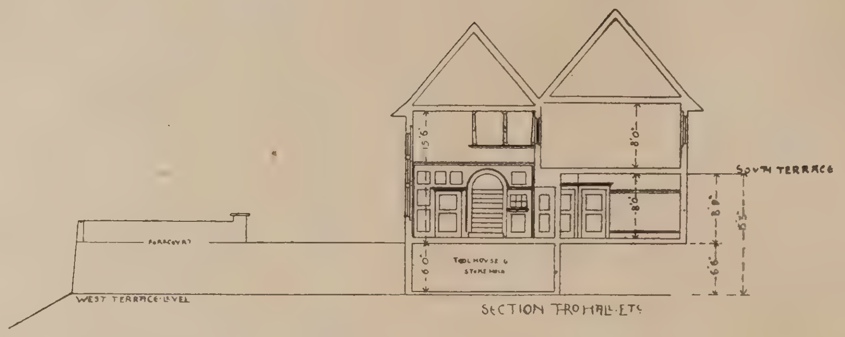

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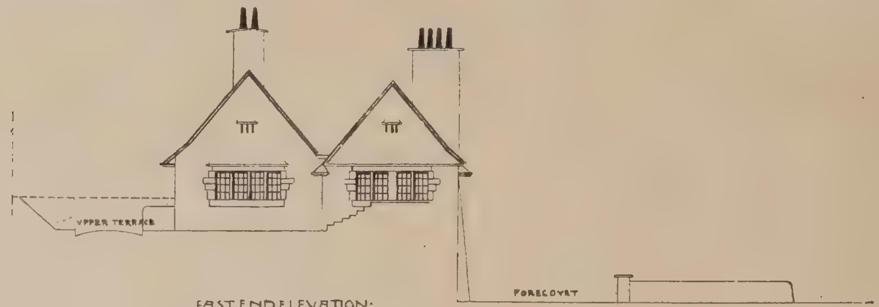
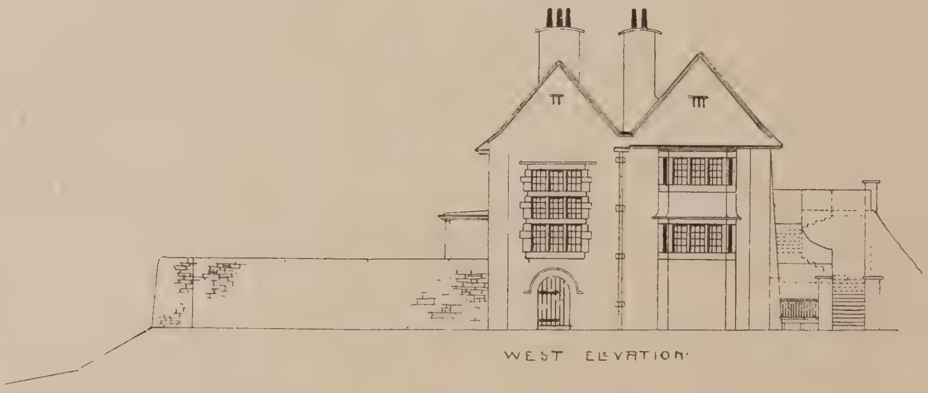


EAST END ELEVATION·



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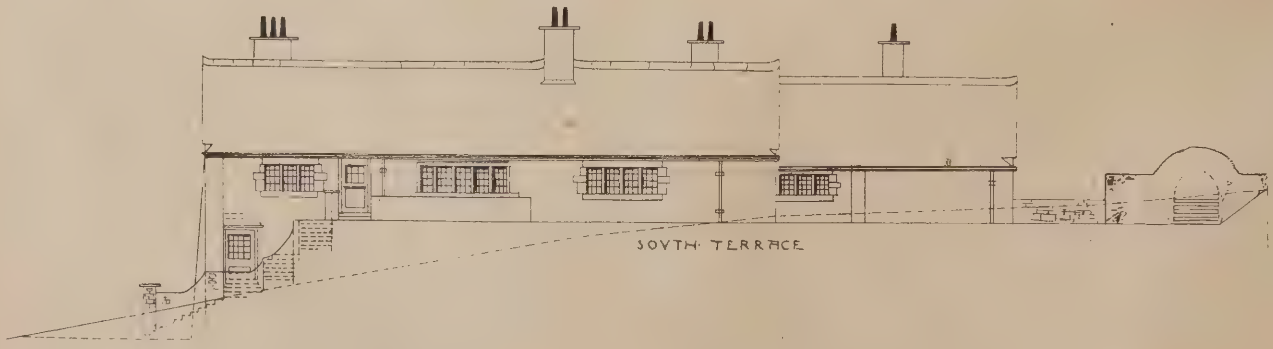

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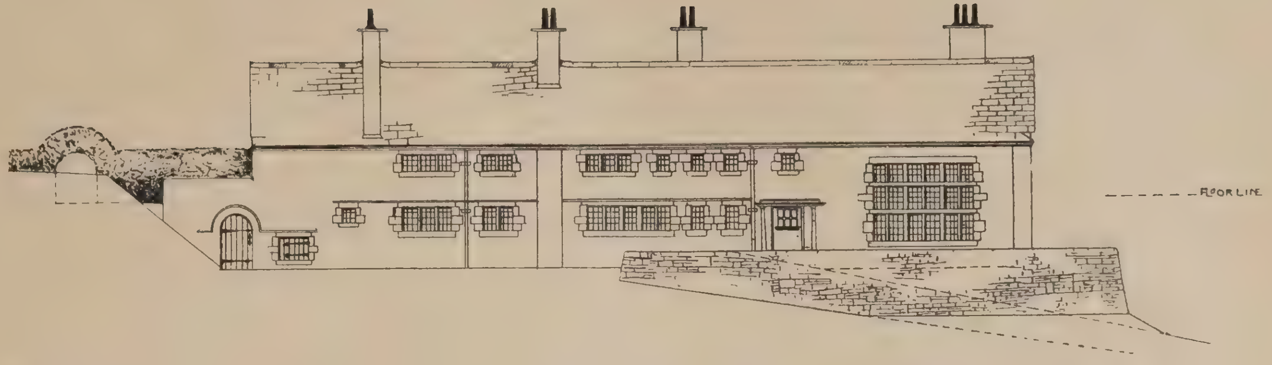
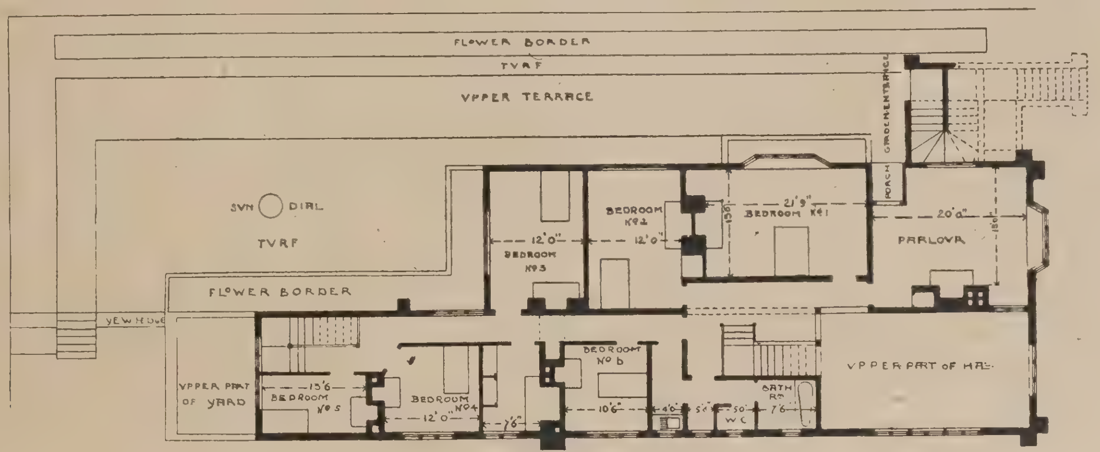
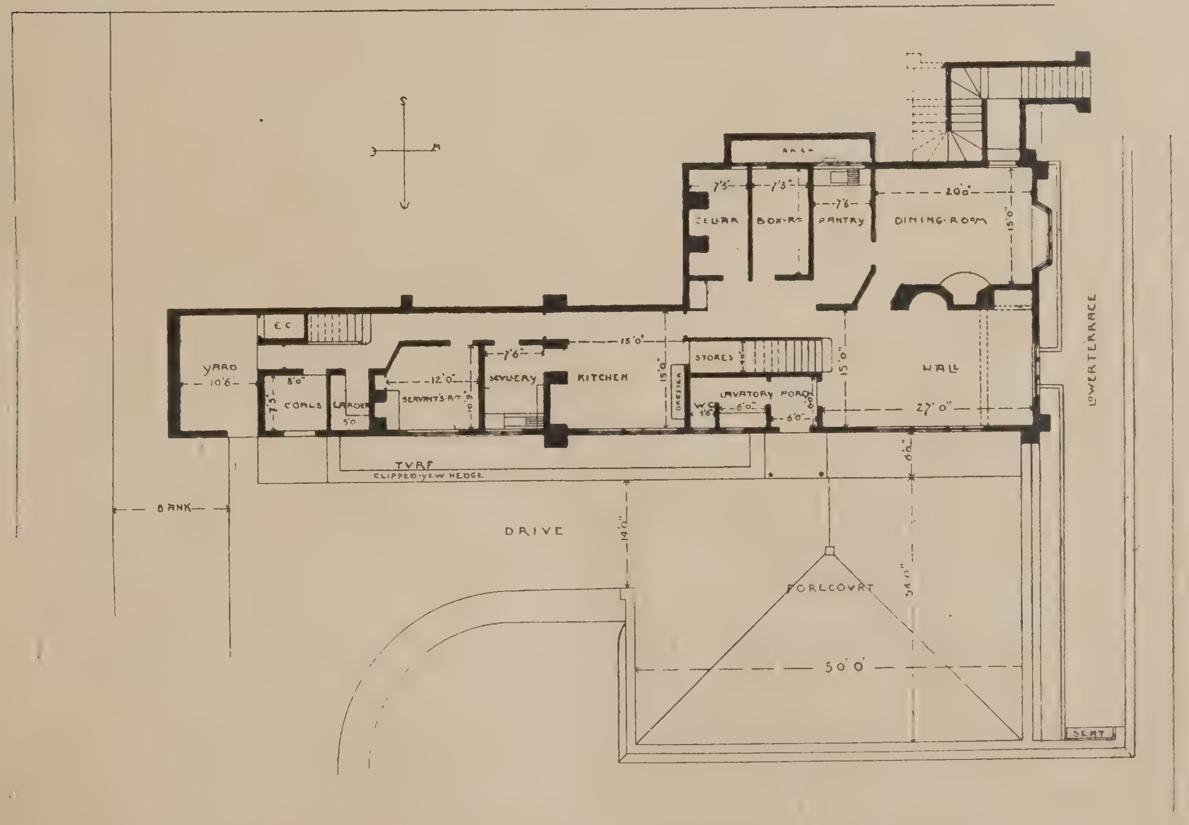




BED ROOM PLAN



X. C. F. A. Voysey, Architect.

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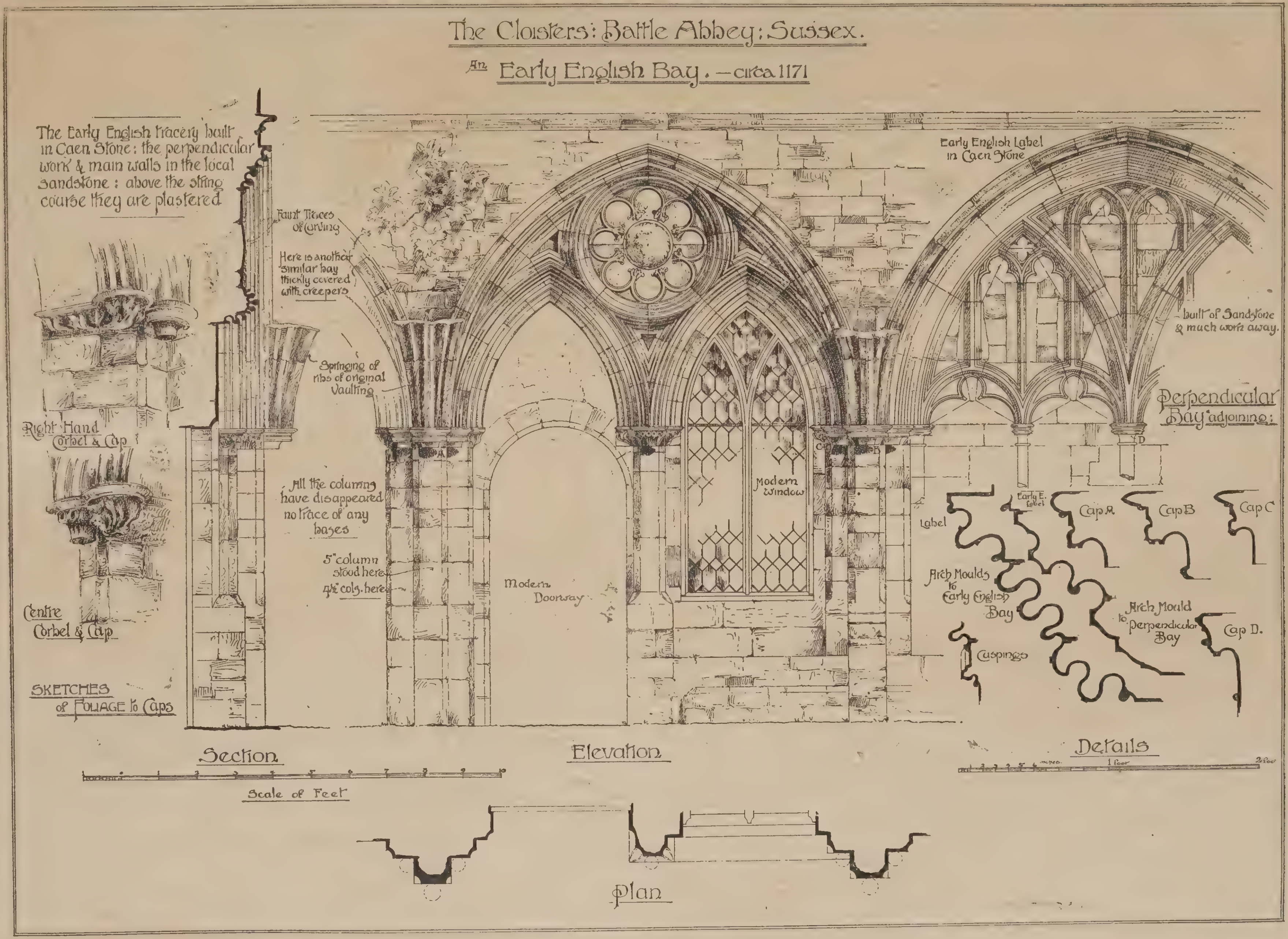
The Cloisters: Battle Abbey: Sussex.
An Early English Bay. —circa 1171
The Early English tracery built in Caen Stone: the perpendicular work & main walls in the local sandstone: above the string course they are plastered
Faint Traces of Carving
Here is another similar bay thickly covered with creepers
Springing of ribs of original Vaulting
Right Hand Corbel & Cap
Centre Corbel & Cap
SKETCHES of FOLIAGE to Caps
All the columns have disappeared no trace of any bases
5" column stood here
4½" cols. here
Modern Doorway
Modern Window
Early English Label in Caen Stone
built of Sandstone & much worn away.
Perpendicular Bay adjoining:
Label
Early E. Label
Cap A
Cap B
Cap C
Arch Moulds to Early English Bay
Arch Mould to Perpendicular Bay
Cap D.
Cuspings
Section
Elevation
Details
Scale of Feet
1 foot
2 feet
Plan

Measured and Drawn by HERBERT HALL.

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R. I. B. A.

ASYLUMS AND ASYLUM PLANNING.

A MEETING of the Royal Institute of British Architects was held at the rooms in Conduit Street on Monday evening last, when Mr. E. A. Gruning, vice-president, occupied the chair. After an address by the president to the members in relation to the death of the Queen, and one presented by the Council to His Majesty the King on behalf of the Institute, had been read by the secretary, it was announced that in the ordinary course of events on the evening in question the name of the Royal Gold Medallist would have been announced; but this medal was a personal gift of the late Queen, and it was at this time not deemed expedient to approach the King on the subject. The Council intend, however, to make application shortly to His Majesty in reference to the matter.

The following gentlemen were then elected:—As Fellows: Messrs. F. S. Baker (Toronto), A. C. Blomfield (London), C. J. Blomfield (London), G. F. Collinson (London), W. Flockhart (London), John Leeming (London) and Joseph Leeming (London). As Associates: T. B. Ball (Weston-super-Mare), E. W. Banfield (London), G. Brumell (Morpeth), H. M. Cautley (Ipswich), W. G. St. John Cogswell (London), W. E. B. F. Crook (London), H. A. Douglass (Crowborough Cross), T. W. Gordon (Nottingham), A. H. Goslett (Great Stanmore), Shirley Harrison (Leicester), C. E. Hutchinson (London), A. L. MacGibbon (Edinburgh), R. H. J. Mayhew (London), W. V. Morgan (Carmarthen), R. W. Owen (Liverpool), A. W. Papworth (London), J. Quail (Manchester), F. J. O. Smith (London), E. J. Trench (Cambridge), C. B. Thomas (London), H. A. Tinker (London), P. J. Turner (London) and W. J. Walford (London). As Hon. Fellow: Sir Lawrence Alma-Tadema, R.A., F.S.A.

A paper on "Asylums and Asylum Planning," by Mr. George T. Hine, F.R.I.B.A., was then read by Dr. Hayes Newington.

Mr. Hine said that asylum construction embraced the study of almost every description of building, from a church to a cow-shed, and the art of combining so many dissimilar structures into one harmonious whole, with the engineering skill necessary to provide for and supply heat, light and water to what is practically a little town, made asylum architecture an almost distinct profession in itself. After giving an historical sketch of the progress and development in the building of public asylums, referring to many epoch-marking buildings, the author described some of the most notable erections since the Act of 1845 (which made it compulsory on local authorities to provide asylums for the insane in boroughs and counties in England and Wales), indicating the various stages in the evolution of asylum planning, a study of which is essential to a proper appreciation of its latest developments. Existing types of plan are all more or less developments of the corridor and pavilion systems. In the early days the corridor system, consisting of a long gallery, with single rooms opening out of it, was the only recognised principle on which an asylum could be built. The form was usually quadrilateral. After the Act of 1845, while the internal arrangements savoured less of restraint, the principle of the corridor system still prevailed. The first development was an attempt at classification by the introduction of a ward for the sick and infirm on each side of the building; the number of cells was reduced and more patients were allowed to sleep in associated dormitories. In the seventies special provision began to be made for epileptics, and the Lunacy Commissioners in 1874 published a plan designed by Mr. Howell for an epileptic ward, which has been adopted with trifling variations in nearly every asylum designed within the last twenty years. In the decade 1871-80 the most notable departure in planning is met with in the Lancashire County Asylum, at Whittingham, designed in what Burdett describes as the corridor-pavilion style, and characterised as one of the finest specimens of asylum architecture in England. The Gloucestershire second county asylum, erected on the pavilion system, the blocks being arranged in échelon, was the first of this type erected in England, and may be said to have originated the oblique or broad-arrow form of corridor now so commonly adopted in asylum designs. The Surrey second county asylum at Cane Hill, one of Mr. Howell's chief works, and accommodating 2,000 patients, is on the pavilion type, the blocks radiating from a main corridor of horse-shoe form. Criticising the variation of floor levels in this building, which necessitated flights of steps in the corridor, the author was of opinion that this irregularity could have been avoided by a more careful consideration of the surface levels of the ground and a little more excavating. He urged architects designing asylums to give a first consideration to the site. In many of the plans coming under his official notice the buildings were generally left to adapt themselves to the site rather than the site being adapted to the buildings. Describing the Claybury Asylum, designed by himself, the problem to be solved was how to accommodate 2,000 patients within reasonable distance of the administrative centre without prejudice to the position and aspect of their wards. The plan he adopted was a modification of the échelon type, the wards being approached from obtusely oblique corridors, the pavilion system being almost a necessity from the conditions issued. The asylum is built on the top of a hill, falling all ways, and by removing the apex of the mound, representing nearly 100,000 yds. of soil (which was well disposed of in filling up a valley to the north of the asylum), a level plateau was obtained, sufficient to allow of about half the patients' blocks and the whole of the administrative department being erected at one uniform level, the remaining wards being slightly lower, but in no case more than 5ft. below the central buildings. At Bexley Asylum the author first introduced the villa system on a tentative scale of three villas holding 35 patients each, and a detached hospital for 50 phthisical cases or others requiring isolated treatment. In this asylum, which accommodates 2,000 patients, all the wards communicate with one another, and an officer may pass from one end of the male or female side to the other without retracing his footsteps or being obliged in return to the main corridor. Bexley has proved so satisfactory that the London Asylums Committee have arranged with Mr. Hine to use the same plans, with a few modifications and improvements, for a second edition of this asylum at Horton.

Numerous other asylums were referred to, the author indicating their distinctive features and in many cases exhibiting plans.

The London Asylums Committee have found it necessary to add temporary buildings to some of their asylums. These erections, chiefly of wood and iron, provide accommodation for 1,700 patients at a total cost of about £173,000, averaging £100 a bed—a costly expedient, considering the limited life of these structures.

In 1889 the London County Council appointed a committee to enquire into and report upon the advantages of the establishment, as a complement to the existing asylum system, of a hospital with a visiting medical staff for the study and curative treatment of insanity. Their report showed the evidence to be greatly in favour of the scheme, and they summed up strongly recommending the establishment of such a hospital. The County Council nevertheless ignored the recommendation, and have continued building asylums on the old lines. Other county authorities, however, have taken up the matter, and are providing hospitals for the reception and treatment of curable cases. The provision of acute hospitals the author considered to be one of the most important evolutions in modern asylum planning.

Dealing with asylums on the Continent, various plans were shown of German asylums, and interesting details given of the villa system as seen in the asylum at Alt Scherbitz, which may be said to have originated this type of planning, now adopted more or less in modern American asylums, and more recently, but to a less extent, in England. The villas are constructed very much like boarding-schools, with day and class-rooms on the ground floor and associated dormitories above. The doors and windows are open, and the patients come and go as they please, wander about or work in the grounds, enjoying comparative freedom, but always under the watchful eye of carefully-trained attendants. No wall encloses the estate, only a light and easily climbable fence. The gardens surrounding the houses in the central establishment are enclosed with palings, grown over with plants and creepers. The colony is bounded on the south by the river Elster, which flows at the foot of a steep hill in the grounds, and there is nothing to prevent a patient rushing down the hill and plunging into the river. Great value is attached to residence in the colony, and patients are given to understand that their stay there depends on their good behaviour, and are thus encouraged to exercise self-control.

Having given an account of asylums as they are, the author went on to deal with future possibilities of asylum designing, and then gave a detailed description of an asylum as it should be, instancing a building to accommodate, say, 800 patients, with provision for future extension to 1,200. As an illustration, the plans were referred to of the new East Sussex Asylum now being erected at Hellingly.

To understand the first principles of asylum construction, it is necessary to know something of the eccentricities of insanity and the habits and treatment of the insane. The author recommended the student in asylum planning to make friends at all opportunities with the medical experts, and to study the subject in the light of those whose duty it is to look after the insane.

In the ideal asylum the most important building must be the acute hospital. Here it is that every patient, unless hopelessly incurable, is admitted, and during his stay in this hospital his future life is probably determined, whether he shall recover and go back into the world, or whether he shall pass on to the main asylum for the remainder of his days, to eke out an unhappy existence at a cost of more than £30 a year to his country. On every ground we cannot afford to neglect anything—consideration, care, or money necessary to produce a building—which affords the doctors the best opportunities for treating and curing their patients. Any money thus spent will prove the truest economy in the end.

The various parts of his ideal asylum having been discussed in detail, together with the engineering works, internal fittings, laundry, systems of heating and ventilation, &c., the author concluded his paper by a reference to the cost. He was of opinion that a well-built asylum, designed on liberal principles and fitted with all modern appliances, cannot be erected for much less than £300 a bed. Twenty-five years ago Nottingham Borough Asylum cost £170 a bed. But that the increased cost is not out of proportion to that of other building works is shown by the report of the Metropolitan Commissioners, where the cost of fifteen asylums erected before the year 1845 is stated to have averaged £200 a bed, some even then approaching as much as £300 a bed.

A discussion followed. Dr. Murray Cook (one of the members of the Lunacy Board), speaking of the cottage type of asylum in Germany, said that in that country a great proportion of the cases were very mild, so mild that here they would be dealt with in workhouses. He favoured having in all asylums a separate detached hospital for the special treatment of all recent cases which presented a prospect of cure. In his opinion more attention needed to be given to single rooms, which were often too small. As to the heating, he preferred steam coils; flues were often the source of much trouble and should be abolished whenever practicable. Another matter requiring special attention was the airing court: it was often much too small and unpleasantly situated. Dr. Urquhart said the latest model in asylum planning was the East Sussex Asylum; in America the latest was the St. Lawrence State Asylum. Mr. Clifford Smith and Mr. Gordon Smith also spoke. Mr. Hine replied and the meeting then terminated.

Law Cases.

Electric Light Signs.—In the High Court of Justice on Saturday last (before Justices Bruce and Phillimore) judgment was given in the case of *Hull* v. *The London County Council.* It was an appeal by Mr. Hull, a shopkeeper carrying on business in the Seven Sisters Road, London, from a conviction for exhibiting over his shop an electric advertising sign. The conviction was for a breach of the London Buildings Act, which provides that no obstruction, lamp, bracket, or projection from a building beyond the general building line, &c., should be permitted without the consent of the London County Council. For the appellant it was contended that the sign in question was erected in a window over the shop, and was no projection within the meaning of the section, and, therefore, the conviction was bad. Mr. Justice Bruce, in delivering judgment, said it was contended by counsel for the respondent that the section was wide enough to extend to anything attachable to a building. Their lordships did not think the words were so wide as to do that, as it was clear the intention of the statute was to preserve the width of the street in order to maintain architectural uniformity. They felt strengthened in the conclusion at which they had arrived because no inconvenience was likely to arise. The London County Council had power to make by-laws for the regulation of lamps, signs, projections, and such like, and a penalty might be imposed for any breach of the by-laws. The action taken by the respondents was barred by lapse of time; and after giving the whole matter the best consideration they could they came to the conclusion that the conviction must be removed, and that the appellant was entitled to the costs of the appeal. Judgment accordingly for the appellant, with costs.

Sale of Building Plots: Jury's Verdict Reversed.—The case of *Keats* v. *Rendle* was heard last week before Mr. Justice Day at the Devon Assizes. This was an action brought by James Henry Keats, architect, of Plymouth, against Mr. E. M. Russel Rendle and Mr. C. B. Rendle for commission earned, and also claiming damages for wrongful dismissal, the total claim being £1,600. Defendants denied entirely the owing of any commission or that plaintiff had been wrongfully dismissed. Lord Coleridge (for the plaintiff) said that defendants and others had been the owners, or trustees, since 1876 of the Vinstone estate at Compton, Plymouth, and were desirous of having it laid out as building plots. Plaintiff was consulted, and after several interviews it was substantially arranged that he should act as architect to the estate, that he should be empowered to sell building plots at a price to be agreed upon, and that in addition to 5 per cent commission he should receive £4 4s. from the purchaser of each plot. Upon this arrangement general conditions were embodied, and Mr. Keats took over the duties of architect. Messrs. Woolcombe and Pridham, who were at that time solicitors to the trustees, wished the commission to be limited to lands comprised within the meaning of building land, but plaintiff replied that in connection with all land he must have a commission of 5 per cent., even though the land might not necessarily be sold for building purposes. If he found a purchaser for land, although it might not be built upon, he expected his usual commission. For a considerable time matters went on satisfactorily, but in 1896 a dispute arose in regard to certain land to be let to a Mr. W. Law. Plaintiff had had some correspondence with this gentleman, but in October, 1896, he was informed by Messrs. Rooker, Matthews & Co. (acting for defendants) that it was possible the owners might receive an offer for a considerable portion of the property in block, in which case they would not require the further advice of an architect; therefore, plaintiff was to kindly let them know his charges against them, as the co-owners were anxious to clear off the liabilities on the estate. At this time plaintiff had been working eleven years on the estate, having supervised the draining and other necessary work for its development. In consideration for all time and labour he naturally expected ultimate commission on the plots. He declined to agree to their arrangement, and stated that he should claim from the vendors 5 per cent. commission on the purchase-money of any land sold included in his building plans, together with the contract fees which the general conditions provided for. Plaintiff contended that he was engaged by the defendants to be their architect and adviser until the whole of the building plots were sold, but as soon as the defendants believed they had a purchaser for the whole of the land they desired to get rid of his services and dispute an arrangement previously made so as to evade the payment of commission. Mr. Duke (for the defendants) said that Lord Coleridge had put the case before the jury as if it had been a very hard one for plaintiff, and that he had been served badly by the vendors. The whole thing was ridiculous. What land plaintiff had sold he had been well paid for, and according to a settled price. Had the jury ever heard of a man being employed to sell land on commission for life, and that he and no other could be employed for the purpose? He protested against the suggestion that the vendors desired to deprive plaintiff of commission. The learned judge, in addressing the jury, said: This is a most extraordinary action. My career at the bar, both as counsel and judge, has been a long one, but I must at once say that I have never heard of any action like this before. I have never heard of an action brought by a person against another for commission and services unless there has been an agreement in writing, or of some form. Here you have nothing whatever in the form of an agreement, but merely something entered in an every-day diary of a conversation, or something of that kind. Plaintiff tells you that he was to receive 5 per cent. commission on building sites on this estate, no matter if the last is not sold until years to come; in fact, that his appointment is a life-long one, no matter how many years he has to live. Can you believe that plaintiff had the right to dispose of plots whenever he liked and to get his commission? There is no such specific evidence that such is the custom of architects. After a quarter of an hour's deliberation the jury found a verdict for plaintiff for £200. Mr. Duke: I ask for judgment to be entered for defendant. His Lordship: And I grant it. The learned judge therefore set aside the verdict of the jury.

Surveying and Sanitary Notes.

A Welsh Sewerage Scheme.—The sewerage scheme for Senghenydd, Abertridwr, and Caerphilly has now been constructed by Mr. T. Rossiter, builder, Caerphilly, at a cost of £13,000. The main extends from Senghenydd to Wainybarra Farm, a distance of about six miles.

Institute of Sanitary Engineers.—At a meeting of the election committee held on the 13th inst. the following were elected:—Members: H. J. S. Abrams, London; W. N. Cosgrave, Straits Settlements; T. A. Groghan, Buxton; J. E. Scott, Newcastle-on-Tyne. Associates: G. W. Bird, Ripley; A. E. W. Blissett, Clifton; W. T. Mansfield, London; and J. J. Pratt, Hillingdon.

Mr. William Williams, surveyor for the county of Brecon, died last week, at the age of 78 years. Mr. Williams held the county surveyorship for thirty-six years, having succeeded his father, the late Mr. William Williams, of the firm of Messrs. Williams and Sons, builders and contractors, in the appointment. He was also one of the diocesan surveyors for the diocese of St. David's, and for a number of years filled the position of agent of the Penpont Estate.

"The State of London Streets," was the subject of a paper read by Mr. Thomas Blashill, F.R.I.B.A., at the Sanitary Institute, Margaret Street, W., last week. Mr. Blashill said that if he asked them to agree with him that their streets were dirty and ought to be cleansed, it was because he could see the dirt and knew that the means of cleansing were well within their reach. He would not say, as some had said, that London streets were the dirtiest of any to be found in the cities of Europe, but amongst the great Continental towns that he had seen, whether capitals or not, there was nothing similar to them. In all such towns the streets, however they might be paved, were kept clean. Thirty years ago the condition of the roadways in London, both as to paving and cleansing, was a matter of serious consideration. He had taken some interest in the matter, and sketched the design from which was made the "street orderly bin" that was now used on nearly all their asphalt roadways and might be seen in the chief Continental cities. In Glasgow they had hundreds of receptacles sunk in the pavement. Sometimes trucks or barrows were used, as in Holland, where the town streets were admirably kept. He was convinced that for town thoroughfares that was the only satisfactory principle. The work of a scavenger should no longer be considered of a low class, or even "unskilled"; it should be well paid and made to attract respectable, able-bodied men. The horse-broom, where needed, should be used with discretion, and kept in good order. He offered suggestions as to the material for roadways, and said that "Macadam" was never carried out as the inventor intended. A scheme which seemed feasible was carried out at Hamilton, in Ontario, where, after long experiment, a macadam of limestone saturated with boiling tar had been adopted. He thought that if granite stones which would pass through an inch and a half ring were mixed dry with boiling pitch, as was done with large gravel, and laid on a firm bed, then sprinkled with fine chippings and lightly rolled, a good hard roadway would be obtained. He had a strong and unhesitating opinion that the dirt in our streets, apart from odious comparisons, had increased, was increasing, and ought to be diminished.

Quarry Notes.

A Large Block of Compact Grey Granite has been quarried recently by one blast at the De Lank granite quarries, Bodmin. The block was of the finest grey granite, measuring 68ft. long by 20ft. wide, by 14ft. deep, and weighed about 1,400 tons. It is to be used principally in the construction of the Beachy Head lighthouse. This is believed to be the largest and finest block of grey granite ever produced in the United Kingdom. It was from this quarry that the granite for the Eddystone Lighthouse and the Tower Bridge, London, was obtained.

Tunnelling Through Solid Granite.—A tunnel through two and a half miles of solid granite has been successfully accomplished in the United States, where it has been necessary to cut through the Cascade range of mountains. This work is considered one of the most notable engineering feats of the century. Boring was started at each end towards the centre, and so accurate were the engineers' calculations that at the meeting point the difference of alignment was scarcely 1in. This cutting through refractory material was accomplished in 45 months by 800 men, operating 32 compressed air drills.

Solid Stone has been made to flow under pressure in some experiments made by Messrs. F. D. Adams and J. T. Nicholson upon pure Carrara marble. Polished columns 1in. in diameter and $1\frac{1}{2}$in. in length were placed in a wrought-iron tube, the ends of which were left free, and pressures up to 13,000 atmospheres were exerted by means of accurately fitting steel plugs. Under these conditions the marble was permanently deformed, its flow being like that of metals, and in some respects like that of glaciers. The colour was changed to dead white, the strength being weakened more or less according to the time required for the change. At ordinary temperatures the deformation was due in part to granulation, and in part to twining and gliding of the single crystals comprising the rock; but at elevated temperatures only the twining and gliding took place.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Stresses in Arched Lattice Girder.

KENSINGTON.—C. H. G. B. writes: "Kindly give a simple formula for working out the strains on an arched lattice girder, as I am thinking of using one as a roof principal."

There is no simple formula for calculating the stresses in such a roof truss as this. It is one of the indeterminate cases, and assumptions have to be made that may or may not be justified by the construction. It is usual to consider that the radial bars, like the vertical members of a lattice girder, transmit half the load that reaches one end through the bar to the other end. The accompanying diagrams show an attempt to work out the case by a reciprocal diagram, but owing to the smallness of the scale the closing points 15–16, which ought to be in the same horizontal line, are separated by a considerable interval.

HENRY ADAMS.

A Building-line Question.

FOLKESTONE.—QUERIST writes: "Supposing a person purchases a plot of land for building purposes, and on the agreement it states that the building line must be 30ft. from the boundary of the property. Is not the 'building line' legally considered to be the main wall of the house and not the bay-window projection, as shown on sketch (not reproduced). The former owner of the land states that the building line is that of the bays, which project 2ft. 6in., and he says he can make the present owners pull them down?"

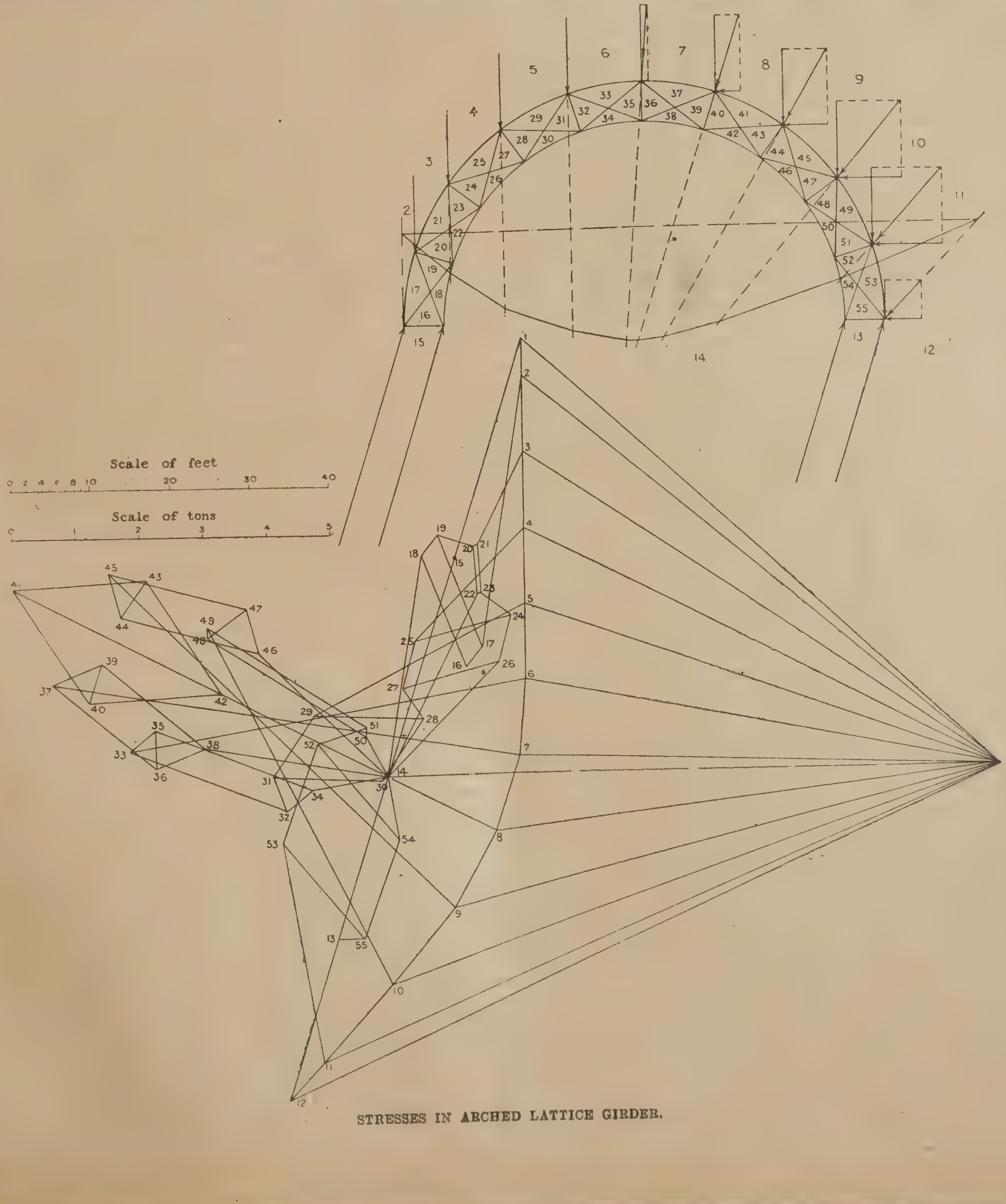
Undoubtedly the generally accepted definition of "building line" is that laid down in the "Model By-laws." "Width, applied to a new street, means the whole extent of space intended to be used . . . as a public way, exclusive of any steps or projections therein, and measured at right angles to the course . . . of such street." We do not know how far this affects your case, as your agreement is evidently a private one. Nor do we know how long your premises have been built; for if your houses were erected and the bays completed for a considerable period of time before the former owner raised his objection, we think it would be held in a court of law that by not giving you notice of objection at an earlier date the former owner gave his tacit consent to your interpretation of the term "building line."

R. W. C.

Building Construction.

BRIXTON, S.W.—DERRICK writes: "Would it be beneficial to a person who has not much knowledge of mathematics, but who has a good knowledge of the construction of buildings in general, to undergo a course of instruction in stresses and strains in structures? Also, would it be advisable, without having any knowledge of trigonometry or advanced mensuration, to take up a course in land surveying? I wish to acquire sufficient knowledge to enable me to deal with the small surveys generally needed in the routine of an architect's office, and for the intermediate examination of the R I B.A."

We think it would benefit you in the highest degree to undergo the course of training in stresses, etc., which you suggest. Presumably you have the ordinary school knowledge of mathematics and the subject should give you no trouble, though we should advise personal



STRESSES IN ARCHED LATTICE GIRDER.

tuition, as in that case every difficulty that arises is more quickly explained. A practical knowledge of land surveying may be acquired without the assistance of trigonometry. Here again we should recommend personal tuition in out-door classes. R. W. C.

Making Wood Floors Sound-Proof.

MARGATE.—C. F. H. writes: "Kindly describe an economical method of making a wood floor sound-proof."

The article on this page will supply our correspondent with the information he needs.

Whitening a Ceiling.

MALTON.—R. N. F. writes: "I should be glad to know how to whiten the ceiling of a farmhouse kitchen. All local men have failed. The fire has for some time smoked badly, and it may be that inferior oil lamps have been used which have also blackened the ceiling. Cleaning, sizing and whitening is no use as the ceiling is yellow at once, the colour striking through. Now that the causes of the discolouration are removed I should like to remove the effects."

Obviously smoke is the cause of the discolouration. Various methods have been used to remove or hide the effects of smoke, such as coating the ceiling with newly-slaked lime, applied while hot; after allowing the limewash to remain for three or four days to enable the lime to kill the smoke effects the ceiling is washed, and when dry whitewashed in the usual way. A solution of chloride of lime applied and the ceiling treated in the same way as above has also been used with more or less success. Another method generally successful but more costly than the above methods is effected by thoroughly washing the ceiling, and after it is dry painting with a good oil paint; when the ceiling becomes dirty in time through use it can be whitewashed in the usual way. Ripolin is a good paint for this and many other purposes, as it is easily applied, resists discolouration, and can be readily washed when soiled. An effectual and permanent remedy can be obtained by covering the ceiling with plain-face fibrous plaster slabs or with "Ornato" slabs. These slabs are easily fixed over the existing ceiling, thus covering all its defects and strengthening the old plasterwork. The slabs being dry when fixed and having a finished surface can be painted or whitewashed as soon as fixed. W. MILLAR.

Imitation Stone.

LONDON, N.W.—J. H. W. writes: "I wish to make some imitation stone. Can you tell me the best materials to use with the Portland cement when gauging. I particularly want a yellow and light-coloured stone."

Artificial stone is made with a combination of Portland cement and a suitable aggregate, such as granite chippings, crushed slag, broken stone, bricks or pottery, gravel, breeze, or sand. The proportions of the aggregate vary from three to seven parts to one of cement, according to the purpose for which the stone is required. A yellow colour can be obtained by the admixture of a yellow oxide, and a light colour by the admixture of powdered chalk to the cement. A durable yellow colour is also obtained by the use of yellow sand, and a durable white colour can be obtained by the use of silver sand. These sands are used in combination with the cement used for the "slip," *i.e.* the first gauge used for covering or facing the moulds when casting artificial stone. Good yellow sand, also silver sand, fine but sharp and well adapted for these purposes, can be obtained from J. Arnold, 32 St. Paul's Road, Camden Town, N. W. MILLAR.

A new School at Preston.—The T. C. Hincksman Memorial School, Croft Street, was opened recently. The plans for the new premises were prepared by Mr. Robt. Curwen, of London, and the tender of Mr. George Lucas, for £3,850, was accepted for the work.

Masters and Men.

The International Union of Building Labourers held its annual convention last week at Paterson, New Jersey. It was decided, on the suggestion of representatives from England, to amalgamate with the National body in England.

Blackpool Joiners' Strike.—As an outcome of this strike, the members of the Blackpool and St. Anne's branch of the Amalgamated Society of Carpenters and Joiners are taking definite action with a view to the establishment of a united joiners' works in the town. During the protracted struggle the men have executed several jobs on their own account.

The Teesside and Hartlepool Joiners have sent a demand to the Master Builders' Association for an advance of wages to date from May 13th next of one penny, or from ninepence to tenpence per hour. Alterations of rules with regard to permitting men unable to commence work at half-past six to start at seven, and seeking an allowance for lodgings when working outside of the town are also included in the demand.

The Northern Bricklayers on strike have agreed with the master builders for arrangements to be made for the Board of Trade to appoint an official to act as umpire at the forthcoming arbitration proceedings. Each party has their own representatives to lay their claims before the umpire, and he will give his decision shortly as to whether the bricklayers are entitled to an advance of one penny per hour. At the termination of the arbitration court the men will resume work.

The Dundee Masons' Dispute has been settled. Some time ago the Employers' Association issued a notice to the men that wages would be reduced by a penny per hour on February 16th. The men opposed the proposed reduction and threatened to strike. It has now been agreed, however, that wages should be reduced by one halfpenny per hour taking effect on 16th instant, and no further change made in the wages till May, when the matter will be further considered.

The Glasgow Joiners' Lock-out.—After a five weeks' dispute the Master Wrights' Association of Glasgow have given in to the operative joiners. The struggle arose over a proposal by the masters to reduce wages from 10d. to 9d. per hour. The men insisted on the maintenance of the bargain which bound the masters to pay 10d. per hour until the end of April, when a new agreement would fall to be arranged. A notice tantamount to a lock-out was then posted by the masters. The men at once came out, but, as many of the large employers failed to fall into line, there never were more than 800 of the men idle at any time during the fight.

Cardiff Plasterers.—A deputation from the Cardiff Branch of Operative Plasterers waited last week on the Cardiff Public Works Committee to protest against the employment of labourers as plasterers on the new corporation tramways now being laid. The spokesmen said that plastering tools were now placed in the hands of men who had never learned the trade, and it was a trespass on their occupation. If the work were done with shovels there would not be the same complaint. The deputation claimed that the "floating" in preparation for the laying of wood blocks was plasterers' work, but the matter was referred to the borough engineer to report on the practice of other towns.

The Fleetwood Parish Church Spire is stated to be in a dangerous condition. It has been examined by Mr. R. B. Preston, architect, of Manchester, who has sent in a report to the vicar and churchwardens, intimating that the spire must either be repaired or removed. The architect proposed to erect in its place a dwarf spiro with a flagstaff in the centre, surmounted by a weather-vane and cock as an emblem of St. Peter, also to renovate and improve the pinnacles of the tower.

PROTECTION OF HOUSES FROM DAMP, COLD, HEAT AND NOISE.

BY R. W. CARDEN, A.R.I.B.A.

Exclusion of Damp.—Damp-proof courses may be made of lead, asphalt, stoneware and slate, in addition to which there are many patent courses on the market. The usual slate course of two courses in cement is not to be recommended, as a settlement would crack the slates and render them useless as a protection against damp. Lead, in a heavy building, is liable to squeeze out at the sides, and does not form a firm bed for the course next above it: this means the possible chipping of stones or bricks in that course. Stoneware makes an excellent and impervious damp-course, but is not very suitable for use where a vertical course is also required, as this must be of different material. Asphalt is best for both vertical and horizontal work, as it can easily be plastered round at any curve or angle, making the whole system of proofing continuous. The writer's experience with patent bituminous courses has been that they are so unequal in thickness that the joint into which they are built has to be about 1in. wide in order to give the course next above a level bed. Dry areas have been so fully discussed in the technical works on building construction that there is no need to deal with them here. Moreover, an article on "Hollow Walls" was published in the issue of THE BUILDERS' JOURNAL for January 16th last, to which readers can refer.

Fig. 1 of the accompanying illustrations shows the ordinary precaution to be taken for cellars partially (or even wholly) underground. The damp-course in all these figures is of Val de Travers asphalt. For inhabited basements the same precaution might be adopted, though while the wall would be dry it would always feel cold to the touch. A better expedient would be to use a hollow wall, or, better still, a hollow wall protected externally by a vertical damp-course (see Fig. 2). Ventilation to the underside of the floor is obtained by means of air-bricks, the air passing down the 2in. cavity. As in many London houses, it is probable that the ground would be below the floor level at the other extremity of the building, so that the ventilating bricks could be placed as shown by dotted lines.

Fig. 3 is for use where the soil is very moist, where there may be considerable upward pressure against the underside of the concrete. This is a less troublesome method than forming an inverted arch in the concrete, as it saves curving the under-concrete to take the arch and also the difficulties of forming the arch in this position. The damp-course is built *in* the concrete just below the joists: this will effectually keep the damp away from them and prevent rust, the joists being coated with Dr. Angus-Smith's solution before the concrete is put in.

Exclusion of Sound, Heat and Cold.—The principle which underlies all work of this nature is the simple fact that air is a very bad conductor of sound, heat and cold. Therefore form an air layer in everything about the building. Boots that are a little too large are warmer in winter and cooler in summer than boots that fit exactly, because there is room for a layer of non-conducting air in the former, while the latter allows no such protective layer. Figs. 4 and 5 illustrate this principle as applied to floors, Fig. 6 as applied to doors, and Fig. 7 as applied to windows. Patent expanded metal lathing could be substituted for the asbestos slabs in the concrete floor, but the method shown is cheaper, as the slabs are fairly thick and quite capable of being secured to the ceiling joists without the addition of boarding. In Fig. 7 the outer window is an ordinary double-hung sash, while the inner one is a casement made to open inwards. It should be mentioned that there is also another system of double windows in which the panes only are doubled. It is a simple contrivance, but not very efficacious, as in view of the fact that the space has to be contrived in considerably less than half the thickness of an ordinary sash, the layer of protective air cannot be more than $\frac{3}{8}$in. thick.

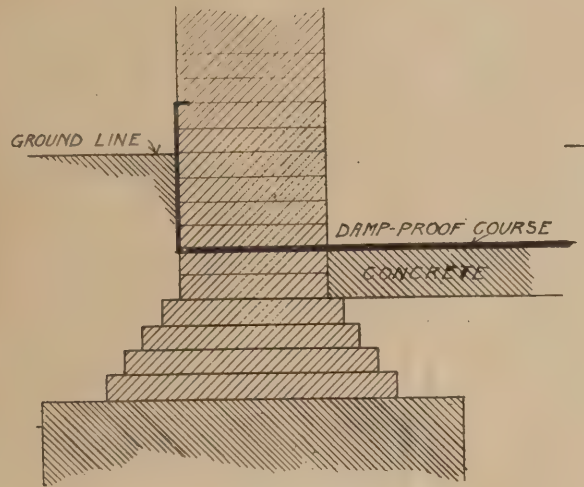


FIG. 1, FOR UNDERGROUND CELLARS

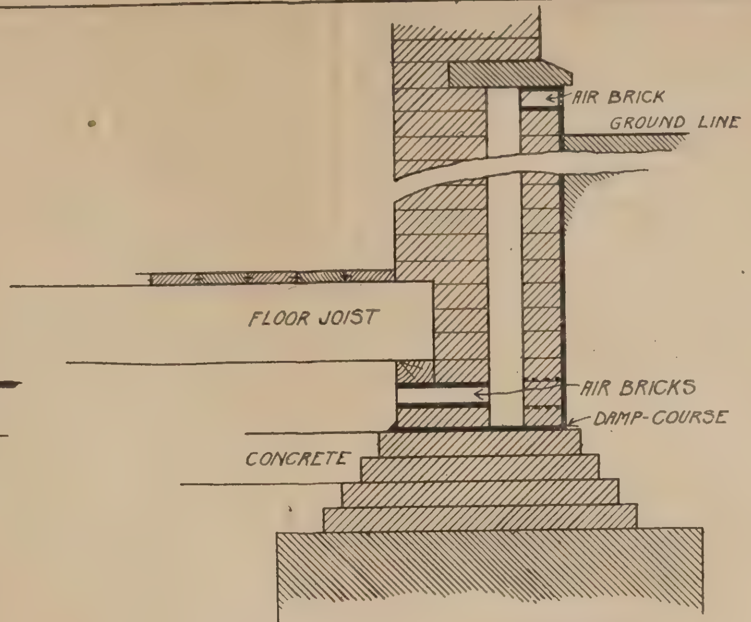


FIG. 2, FOR PARTIALLY UNDERGROUND LIVING-ROOMS.

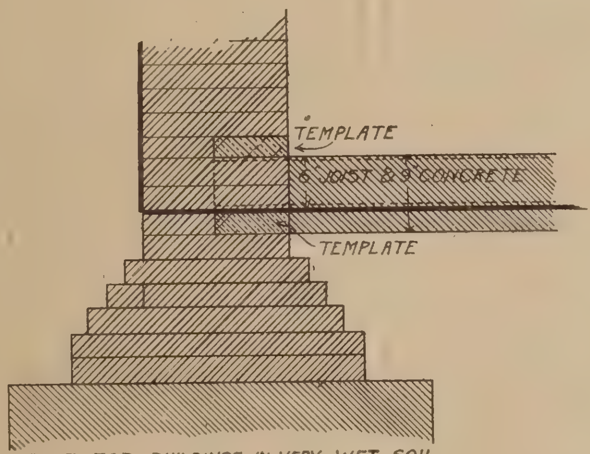


FIG. 3, FOR BUILDINGS IN VERY WET SOIL

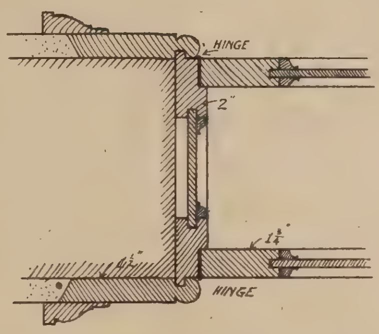


FIG. 6, DOUBLE DOORS.

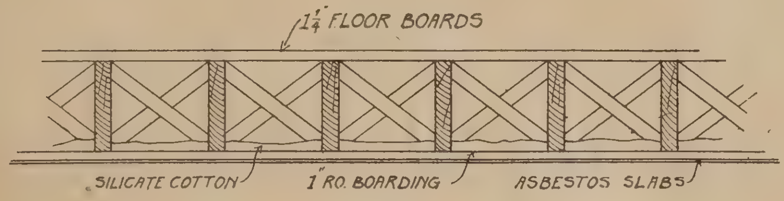


FIG. 4, WOOD FLOOR

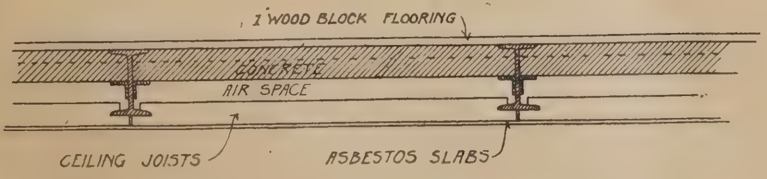


FIG. 5, CONCRETE & IRON FLOOR.

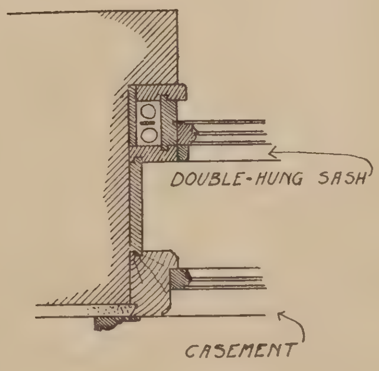


FIG. 7, DOUBLE WINDOWS.

SCALE OF FEET.

12 6 0 1 2 3 4 5

SCALE OF FEET FOR FIGS. 6 & 7.

12 9 6 3 0 1 2

THE PROTECTION OF HOUSES AGAINST DAMP, COLD, HEAT AND NOISE. BY R. W. CARDEN, A.R.I.B.A.

GOTHIC ART AND THE BASIS OF ITS BEAUTY.

A MEETING of the Architectural Association was held on Friday evening last at 9 Conduit Street, W., when the chair was occupied by Mr. W. H. Seth-Smith, the president. After it had been announced that a special general meeting would be held on Friday, March 8th, at 7.30 p.m., when the scheme for the establishment of day classes at the Architectural Association would be submitted to the members, and after Mr. M N. Castello (of London) had been elected a member, Mr. E. S. Prior read a paper on "Gothic Art and the Basis of its Beauty." He asked whether there was such a thing as beauty in art, and cited Tolstoi's deduction that such beauty was a phantom and an impossible endeavour. But whatever might be thought on this point, there certainly was a love of beauty.

He referred to some of the suppositions as to who were the creators of the Gothic art. These might be summed up into three theories—the ecclesiastical theory, the freemason theory, and the architect theory. The ecclesiastical theory would derive the origin of beauty in Gothic art from the faith and character of the religious orders and the members of the several religious houses. In defending this theory the supporters gave to words mentioned in old documents a meaning which was exaggerated or inaccurate, and ascribed to many holy men to whom churches were dedicated the actual design of the building. This could not be maintained. The clearest records from the seventh to the sixteenth centuries proved that the common practice was for the church authorities to hire builders and masons to do their work, and it was these latter who really were responsible for it. Certainly as regards the plan—the accommodation—the abbots and monks did dictate and direct the workers, but there the authority ended. It did not follow that the design of the building lay with him who ordered it. Moreover, the ground plan was very much a matter of tradition, and the construction which followed was done by the masons according to well known lines. It should, however, be mentioned that there was some supervision by clerics. The venerable Bede says that in the seventh century workmen were instructed in building by clerics, and without a doubt stone buildings came as the result of missionary effort. But this must not be carried so far as to affirm that there was a class of clerics who *designed*, and so produced the Gothic art. If records were searched and the correct meaning given to words it would be found that the freemason theory was similarly defective. Macaulay asserted that the English cathedrals were built by travelling masons, and the word "comacine" had been interpreted and extended in a like manner After the eighth century we lose trace of the comacine masons (so called from an island in the lake of Como, where they worked); yet in much later times buildings—even crosses so far away as in Ireland—were asserted to have been erected by them. Anybody in Lombardy was a comacine! Wyatt Papworth had thoroughly investigated this matter and sifted the evidence, and his opinion was that "all the documents lead me to believe that there was no masonic guild in England." It was like all the other guilds, to which the various workmen belonged. There was no brotherhood of masons other than the recognised craft of masonry. But there certainly were master-masons. Mr. Prior then dealt with the architect theory, referring in particular to Street's book on Gothic architecture in Spain, and his conclusion was that in the olden days there was no such person as an architect as we know him to-day—such a person originated in Elizabeth's reign. In fact, everything went to prove that Gothic art was cosmic, not individual; that though, as indicated, certain points of the building were dictated beforehand, the fabric grew up under the combined hands of the several workmen.

A discussion followed. Mr. G. B. Carvill could not conceive how a building like Lincoln Cathedral could be erected without some person in the position of an architect. Mr. G. H. Fellowes Prynne held a similar view. He felt that what Coleridge said was true—the architecture of our churches was the petrifaction of our religion—and it was the religious lives of the men of Gothic times that constituted the beauty in their buildings. Salisbury Cathedral was surely the result of one mind—it showed this too strongly to be otherwise. Mr. H. H. Statham said we should look more at the buildings themselves than at the documents referring to them, and he could not see how some buildings could have been erected other than under the direction of one mind. The remarkable similarity between Ely and Peterborough Cathedrals was cited. Even if there were no such name as architect in olden days, there was a man—perhaps a master-mason—who practically represented him. Mr. Hooper referred to the statement that bands of workmen travelled from town to town, and cited the fact of the same workmen having been employed over and over again by Sedding in the restoration of Cornish churches. Mr. Prior, in replying, said that Lincoln Cathedral, now isolated, was formerly surrounded by other buildings possessing the same characteristics; he then dealt at some length with the other questions raised. The meeting then terminated.

New Patents.

These patents are open to opposition until March 23rd.

1900.—Lifts—1,310, W. B. SAYERS, 189 St. Vincent Street, Glasgow. The cage is fitted at the top with wheels or rollers having resilient tyres (pneumatic or cushion). These wheels run in grooves formed in the vertical guides. The object of the invention is of course to enable the lift to work smoothly.

Measuring Rules.—4,722. R. WEBSTER, 42 Milner Square, Islington, London, and A. G. THORNTON, St. Mary's Street, Manchester. This invention relates to the combination of a wire and metal gauge with an ordinary folding rule. The gauge is arranged on the almost circular hinge, which is perforated at the edge for the purpose mentioned.

Secret-Nailing Wood Floors. — 4,812. T. POTTER, 5 Outram Road, Croydon. The floor boards are rebated or grooved for the purpose of hiding the nails, the rebate or groove being filled (after the board is fixed) by a slip of wood glued in place.

Ventilating Fans.—22,821. H. SIDEBOTTOM, Brazennose Street, Manchester. The fan consists of a flat disc of metal having vanes fixed on it around a central cone. Air is sucked in at the apex of the cone, drawn along its sides, and finally discharged by the vanes at the edge of the fan, the formation of a central vacuum being entirely prevented.

The following specifications were published on Saturday last, and are open to opposition until March 30th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—1,443, ADAMS AND WHITGREAVE, means for spraying liquids, disinfectants, &c. 1,450, HOLME (*Silfverberg*), push for electric bells. 1.776, NÖLTHER, roofing tiles. 2,888, 2,888B, 2 888C, 2.888D, 2.888E and 2,888F, NAEF, method and apparatus for producing gas and by-products. 3,126, LACHMAN, pulleys and wheels. 4,001, ORME, vehicle hoists. 4,389, APPERT, apparatus for rolling glass. 4,686, PERFETT, smoke-consuming stoves. 4,786, MORELLE, apparatus for generating acetylene gas. 4,924, BRADBURY, BRADBURY, BRADBURY AND BRADBURY, guards for circular saws. 6,015, JAMES, drawing pins. 6,131, VON GELDERN-EGMOND AND VON LIPOWSKA (*née* VON GELDERN-EGMOND), sheet-metal bearing plates for buildings. 7,210, VON WELSBACH, osmium illuminating filaments. 12.525, PETRÉANO AND LA COMPAGNIE GÉNÉRALE D'INCANDESCENCE PAR LE PETROLE ET L'ALCOOL, hydrocarbon burner constructed without the use of solder for lighting or heating purposes. 12,990, FRANKLIN, syphon-discharge cisterns for waste-water preventers. 16,345, RICHARDS, metal-cutting machine for planing and shaping. 17,700, JACKSON, kilns. 17,966, KELSEY, process of making glue. 18,211, CHANDLER AND CHANDLER, revolving gas scrubbers and washers. 19.214, BAKER AND DARBY, window blinds. 19,733, WONNACOTT, hinges and fittings for casement windows, &c. 29,045, LOGAN AND PORT, timber-sawing machines. 20,726, REGNARD, apparatus for mechanically washing sand. 21,948, MCKELVEY, concrete mixers. 22,189, JACKSON AND MCDONOUGH, combination wrench, screw-thread cutter and vice. 22,206, BOULT (*Grasset*), carburettors for air and gas. 22 227, VOGT, sinking or boring mechanism. 23 311, RENO, inclined elevators. 23,486, SCHUBIG AND STEIN, cisterns for water-closets.

Correspondence.

Load on Girders.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In Professor Adams' reply to "Student" on page 495 of your issue for January 30th he states that "the minimum load is that portion of the wall contained within an equilateral triangle, having the full length of the girder for a base." I understand the theory is, that the wall over would form a natural arch and throw the weight (over same) on to the piers, so that in the event of the girder being removed, only the shaded part shown in the sketch would fall. But the triangle should have the span for its base, as the span (not the length of girder) is the basis for calculating the load on girders. In the other example the principle of the arch does not apply. Would it not be advisable in this case to take the weight on the beam—span multiplied by the height of wall, openings deducted? Part of this load would be concentrated and part distributed. It is also stated "the allowance beyond weight of material for live load on floors is $1\frac{1}{4}$cwts. per sq. foot for living rooms." In a text-book this is given at $1\frac{1}{4}$cwts. per sq. foot, including weight of floor, for distributed load.—Yours truly, J. D.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—With reference to the above letter, which you kindly forwarded me for perusal, your correspondent is quite correct as regards the natural arch theory, but he is wrong as to the clear span being the basis for calculating the load on the girder. For instance, in the pressure on bearing surfaces it is the load on the whole length of the girder that is acting without any doubt being possible. In the second case the natural arch principle is perhaps not quite so apparent; it might be called the natural corbel principle, and after all it is only an approximate means of arriving at that which does not admit of exact calculation Where there is no object in keeping the load as small as possible it is simpler to take the whole weight vertically over the girder as acting, and this would err on the side of safety. I find that in "Notes on Building Construction," Vol. IV., the second case is given with triangle of 45°, having its base from centre to centre of bearing surfaces. As regards load on floors, a dense crowd averages 120lbs. per sq. ft., and "Molesworth" says: "For flooring $1\frac{1}{2}$ to 2cwt. per square foot, exclusive of the weight of the flooring is generally allowed. In store-houses from 2cwt. to 4cwt. per square foot," so that the text-book which says $1\frac{1}{4}$cwt. per sq. ft., including weight of floor, is not reliable. It might, however, be a sufficient allowance for bedrooms.—Yours truly,

HENRY ADAMS.

Old Lancashire Churches.

To the Editor of THE BUILDERS' JOURNAL.

SOUTHPORT.

SIR,—"Anxious," of Southport (see page 33 of last week's issue) will find in the reference room in the Southport Free Library "Notes on the Churches of Lancashire," by the late Sir Stephen Glynne, edited by Canon Atkinson, of Bolton. The book is Vol. XXVII. of the Chesham Society's publications (1893).—Yours truly, F. H. CHEETHAM.

Professional Practice.

Halifax.—The new Victoria Concert Hall was opened recently. It is situated at the junction of Fountain Street with Commercial Street and Wards End. Mr. W. Clement Williams was entrusted with the work of preparing plans. He was asked to design a hall thoroughly suited for the particular purpose in view, and at the same time to enable the frontage to be used to the best advantage for increasing the revenue by shop rents. The structure, as now completed, comprises a large hall, eight lock-up shops, a restaurant in the basement, and a lecture theatre for smaller meetings. The large hall is 72ft. wide and 120ft. long. The auditorium has sitting accommodation for 836 people on the floor, and is provided with two galleries. The first is set apart as the grand circle, and will seat 500, whilst the upper tier, or balcony, will seat 750. Adding to these figures the orchestra accommodation of over 300, the total seating capacity of the hall is 2,422. It should be noted, however, that, acting upon instructions from the committee of management, the architect has allotted 21in. to each sitter, whereas the average space allowed in public halls throughout the country is from 16in. to 18in. The estimate of 2,500 is therefore a reasonable one. The stage measures 55ft. by 40ft., and is so constructed that it can be used as a platform for dramatic and operatic performances, but is also provided with a removable orchestra for choral-concerts. At the back of the stage will be permanently located an organ at a cost of several thousand pounds by Messrs. Hill and Son, of London. The instrument has been planned with a view to it forming little or no obstruction on the stage, and is divided into two portions, which fit into opposite angles, a screen connecting with the manual in the centre. It will only encroach upon the stage two yards. The area, or lower level, of the hall is fitted with a spring dancing floor that can be blocked and made into a solid floor in three minutes, and is capable of bearing some 800 or 900 persons with safety. This arrangement is a novelty, the invention of the architect. The ceiling and proscenium are of a very ornate character. Various panels are fitted in with figure paintings emblematical of the arts. The galleries are supported on the cantilever principle. The slope of the galleries as arranged, affords every person in the building a clear view of the stage. Under the orchestra are dressing rooms for the artistes. Separate cloak-rooms are provided on each level for both ladies and gentlemen. The large hall is approached by a vestibule 12ft., opening into a hall 35ft. long by 30ft. wide forming an irregular octagon. From the centre of this entrance hall rises the grand staircase 9ft. in width, branching out on the first landing into a double staircase by which the grand circle is reached. On either side of the staircase are entrances to the area each 11ft. wide The balcony is approached by a separate entrance from the higher ground at the junction of Powell Street with Fountain Street. To secure means of exit separate staircases have been constructed at the four corners of each level in addition to the entrances described. All the staircases, corridors and floors are fire-proof, being constructed of concrete and steel. A lounge and a refreshment room are provided on the grand circle level measuring 34ft. by 28ft., and on the balcony level there is a crush-room 44ft. by 21ft. Another addition to the means of entrance and exit is a corridor 7ft. wide, running round the hall on three sides of each level. From this seven separate entrances lead to seats blocked and lettered in both area and grand circle. There are five separate entrances to the balcony. Externally the portion opposite the stage is circular. The shape of the site is irregular, the sides being parallel for a portion of the length. finishing in a long wedge at one end. Around this wedge the ground rises from Commercial Street to Fountain Street 12ft. in the width of the building. Advantage has been taken of the outine to arrange a semi-circular principal entrance, on either side of which there is a lock-up shop 27ft. by 20ft., with access from the entrance vestibule. There are six shops, with work-rooms above and cellaring underneath, each being 22ft. by 17ft. and fronting to Commercial Street. The circular corner has afforded an opportunity to provide a lecture theatre on the first level. This room is approached by two entrances from the approach to the grand circle. It is 56ft. in diameter and has accommodation for 360 persons. Immediately below, in the basement, is a restaurant, 17ft. by 17ft., with a cooking kitchen. The entrance to the restaurant will be from Commercial Street. Provision is also made for the officials. The decorations, both in the principal entrance, the vestibule, the lecture theatre, and the large hall, are in varying shades of rich cream pale blue and gold. No stencilling whatever has been done. The effect has been produced by the ornamentation in the fibrous plaster and by the harmony of colour. The cost has been not quite £30,000, including the cost of the site. The work has been carried out by the following firms:—Painting and decorating, Messrs. Jonas Binns and Son, Halifax; the mosaic flooring in the grand hall, Messrs. Maw and Sons, Jackfield, Salop; the glass dome over the grand staircase, Mr. W. Pape, Leeds; the wood-block flooring, Mr. J. Nightingale, Grimsby; terrazzo and concrete, Messrs. G. Greenwood and Son, Halifax; masonry and joiner work, Messrs. J. Charnock and Sons, Halifax; plumbing and heating, plastering, and slating, Messrs. J. Bancroft and Son; fibrous plastering and modelling, Messrs. J. Binns and Son; seating in the grand circle, Mr. W. Lazarus, London; area seating, Messrs. T. Simpson and Sons, Limited, Halifax; steel-work for flooring, Mr. John Berry, Halifax; steel cantilevers and roof, Messrs. Handyside and Co., Limited, Derby. The whole premises are lighted by electricity, the consulting engineers for this part of the work being Messrs. Shepherd and Whatney, London, and the contractor, Mr. Harry Wright, of Halifax.

Seaforth.—The new Catholic church dedicated to Our Lady Star of the Sea was recently opened. The new church, which has accommodation for 600, is situated on a corner site on the north side of Church Road and the west side of Crescent Road, Seaforth, the main gable facing south towards Church Road. It consists of naves and aisles, apsidal chancel, and two side chapels, baptistery, antechapel, and three porches, together 125ft. long and 55ft. wide, with three confessionals, priests' and boys sacristies, and passage behind the chancel for convenient access from the sacristies. Above the antechapel and porches are a choir gallery and organ chamber, separated from the nave by a stone screen with traceried balustrade. The nave arcade is supported by granite columns, with carved capitals. Above these, springing from carved corbels, granite shafts are carried up to the roof. The nave is lighted by large traceried windows. The roof is carried up by hammer-beam principals with traceried spandrels, &c. The chancel floor, of oak parquetry, is raised six steps above that of the nave. A lofty arch divides the chancel from the nave, and beyond it, the chancel shows five large traceried and gabled windows, three of which are filled with stained glass by Messrs. Hardman, of Birmingham. The church is lighted by electricity, and warmed by low-pressure hot water pipes. Externally, the church is built of Parbold stone, with Runcorn stone dressings. The south gable is divided into two bays for the greater part of its height, with statue niche in centre between two traceried windows, and rose window above. At the south-east corner of the church a tower and spire are intended, but these are at present completed only as high as the nave. Messrs. Sinnott, Sinnott and Powell, of Liverpool, are the architects; Mr. Williams, Seaforth, clerk of works; and Mr. W. Winnard, Wigan, the contractor. The contract amount is between £10,000 and £11,000. The greater part of the carving has been executed by Mr. P. Honan, of Liverpool.

Springvale, Ardrossan.—A new Infectious Joint Hospital for Ardrossan and Saltcoats was opened recently for the reception of patients at Springvale. The site lies about equidistant from the centres of the burghs, is well situated on the higher ground behind Saltcoats, and has a pleasant southern exposure. The buildings are four in number and are designed to accommodate nominally fourteen patients with the necessary staff; in the event of an epidemic, however, this number may be doubled without unduly crowding the wards. The administrative block provides accommodation for a matron, four nurses and two servants, and has kitchen offices of sufficient size to do the culinary work for the whole establishment. The ward block is divided into three sections, thus allowing for the treatment of three distinct infectious diseases. Each set of wards has its own nurses' duty room, bath room, &c., and is entirely disconnected. The wards are well ventilated and heated by hot-water radiators in addition to the fireplaces. All the sanitary fittings are of the most modern description. The laundry and discharge block contains a well-lighted wash-house and laundry with drying-room attached, boiler-house, mortuary and visitors' room, ambulance house and disinfecting rooms. Connected to this building are the rooms where the patients are discharged, being bathed and supplied with clean clothing before leaving the premises, thus guarding against the carrying away of infection. The porter's lodge, which is situated at the gates, is a compact little cottage and controls the access to the grounds. The drainage is carried out on the most approved principle, with inspection eyes at every change in direction so that any portion of the system may be easily examined. The sewage is treated before leaving the site by the septic tank system, the apparatus being designed and supplied by the patentees, Messrs. Cameron, Commins and Martin, of Exeter. The roads and paths leading to the various blocks have been formed, and the avenue leading to the site has been re-made, lamps have been erected and hydrants provided to cope with any outbreak of fire. The whole work has been carried out from the designs and under the direction of Messrs. Fryers and Penman, architects, of Largs. The contractors for the various works were:—Brickwork, Messrs. Greig Bros., Kilwinning; joiner work, Mr. Thos. Miller, Saltcoats; slater work, Messrs. Hogarth and Co., Ardrossan; plumber work, Mr. T. B Stevenson, Ardrossan; plaster-work, Messrs. Murray and McCallum, Saltcoats; painter work, Messrs. John Gilfillan and Son, Ardrossan; heating, Messrs. Boyd and Sons, Paisley; disinfecting apparatus, The Reck Heating Co., Copenhagen; railings, gates and lamps, Messrs. Frazer Bros., Largs. The clerk of works was Mr. James Potter, Largs. The furnishing, which was arranged by the matron and Mr. Adams, the Clerk to the Joint Committee, has been supplied by Mr. John Fullerton, Saltcoats; the medical appliances being supplied by Mr. Wallace, Ardrossan, under the direction of the medical officer, Dr. Fulton, Stevenson.

LONDON DRAINAGE.

THE PURIFICATION OF THE THAMES.

IN the second of a series of articles in the "Daily Chronicle" on the work of the London County Council, Sir Arthur Arnold gives an interesting account of the improvements effected by the Main Drainage Committee. When the sewerage works were commenced in 1855 the Thames at Westminster was nearly as foul as it was at Barking in 1889—at that time one man earned from two to three pounds a week by skimming the noisome fat from the surface of the river and melting it into a commercial commodity. The London County Council inherited three great sewers on the north side; the high level, commencing at the foot of Hampstead Hill; the middle level, beginning in the Harrow Road; and the low level, following the north bank of the river. Day and night, with no rest or intermission, the sewage of a great part of Western London is pumped at Pimlico into the head of this low-level sewer, whence it runs, a sluggish, loathsome, dreadful stream, confined in an egg-shaped barrel of about 8ft. diameter, to Abbey Mills in West Ham; thence the sewage of all London north of the Thames passes in three barrel sewers of 9ft. each to Barking, the contents of the low-level sewer being lifted by pumps at Abbey Mills. Of main sewers at the present time there are about 180 miles on the north side of the river, and 110 miles on the south side.

In 1855, the sewage of London was largely held in cesspits, and for the rest it flowed into the river in its passage through the City. In that year the main sewers were completed, and the sewage was poured out at Barking and Crossness, with terrible fouling of that part of the stream. In 1886, the Board of Works, alarmed at the condition of the river, spent £80,000 in chemicals, and in vain renewed the attempt in the following year with £42,000 worth of chemicals. The Council now expend about half the latter amount annually for lime and iron, by which the precipitation of the crude sewage is promoted.

During the last five years, the chemists of the Council, first Mr. Dibdin and now his successor, Dr. Frank Clowes, have been making experiments as to filtration through coke-breeze, or other material, of this effluent, and the Main Drainage Committee will soon have to consider whether the experimental stage should now be closed, and filtration recommended as expedient for further purifying the sewage effluent. It has been found that a coke filter of one acre in extent, with a depth of about 3ft., will purify a million gallons of sewage per day. For filter beds about 300 acres of land divided between the north and south sides of the river would be required, and this purchase, together with the construction of the filter beds, would perhaps cost little less than £2,000,000. It may be that some other method of improving the effluent will be preferred. But there seems to be no room for doubt that if this work were efficiently carried out the Thames would throughout become conducive to fish life, that Hampton may at some not distant date be famous for its salmon, and that anglers may with every prospect of good sport ply their gentle craft from any part of the Thames Embankment.

Engineering Notes.

Bristol Tramways.—The conversion of the old horse lines and the working by electricity and construction of new lines have cost £650,000.

Heaton Park Liberal Club, Manchester.—This building has just been fitted with the latest improved hot-water heating apparatus by Messrs. John King, Ltd., engineers, of Liverpool.

The Wath and District Joint Infectious Hospital is being warmed and ventilated by means of Shorland's patent Manchester stoves, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Ipswich Dock Improvement.—The Ipswich Dock Commission have decided to complete the tramway round the dock in pursuance of the powers obtained by an Act of 1898. The estimated cost of the work is £50,000.

A new Carmarthenshire Bridge.—The stone bridge erected over the river Bran near Glansevin Mansion by the Llandovery District Council was formally opened last week. It displaces a small wooden footbridge, and has been erected at a cost of £900 by Messrs. Morgan and Sons, of Gwynfe, the architect being Mr. David Isaac, of Brecon.

A French Project.—A project now receiving much attention in France is that for constructing a new railway to enable the existing lines to open up a direct communication with the new route to Italy *viâ* the Simplon Tunnel, now being bored under the Leopontian Alps. France recognises that the opening of the Simplon Tunnel may change the present condition of things in a manner that will be greatly to her advantage, and may restore to her the trade that the St. Gothard took away. Work on the Simplon has been in progress for two years, and has been greatly expedited by the "Brandt drill." Mr. Brandt was a well-known engineer who had had much experience with the St. Gothard tunnel, and he invented a rotary drill of 3in. diameter, driven by hydraulic pressure. The probable cost of the tunnel will be about £2,000,000.

A Model Electric Tramcar.—Last week a model car and the short line laid down in the London County Council's Tramways Depôt in Camberwell New Road were inspected by the members of the Metropolitan Borough Councils. This was to afford them an opportunity of appreciating the details of the conduit system of electrical traction devised by Dr. A. B. W. Kennedy, and provisionally adopted by the Council. The model car is divided into two saloons, capable of accommodating twenty-eight passengers, the seats are comfortable, the gangways wide, the windows exceedingly large; and, further, electric bells have been fixed on both sides of the car, so that passengers can with ease inform the driver when they wish to get out. Outside lights are provided to enable passengers on top to read in the evening, while seats with ingenious covers to protect them from damp in case of rain are a possibility still under consideration. In about eighteen months from the present time it is hoped that at least a part of South London will be provided with electric tramways.

Keystones.

Municipal Buildings at Stockport formed the subject of a Local Government Board enquiry as to an application for sanction to borrow £14,000 for the purchase of a site.

A Memorial to the late Chief Bard Ceulanydd, the Rev. John Williams, has just been erected at the Maesteg-Birthdir Cemetery. It is of polished red Aberdeen granite, about 9ft. high, and massive stone bases bear a square pedestal surmounted by a broken column. The monument has been designed and executed by Mr. T. S. Morris, of Rock Monument Works, Maesteg.

Mr. Walter Crane's Exhibition at Vienna has turned out exceedingly successful. The comments of the Austrian and Hungarian Press (the exhibition has also been held at Budapest) are full of praise. The Austrian Minister of Public Instruction has bought from the collection a number of pictures for the Vienna Modern Gallery and a number of other works of art for the Austrian Museum. The collection now goes to Germany, where several towns are making arrangements to exhibit it.

Lockwood's Price Book for 1901 has been carefully revised and brought up to date. Special attention is given to all new materials and appliances, thus adding to the value and utility of the book. The present issue includes the amended electric lighting rules adopted by the Phœnix Fire Office and the extensive section dealing with electric lighting has also been added to. The book is too well known to need comment. Its price is 4s. and it is published by Messrs. Crosby, Lockwood and Son, of 7 Stationers' Hall Court, Ludgate Hill, E.C.

The Excavations in Pompeii have been carried on steadily during the past year on the northern side of the town, but nothing remarkable has been found except mural paintings, some of which are of great beauty. These have been left *in situ*, as there is no more room for them in the Naples Museum. They are protected as well as they can be, and they are naturally more interesting in their original places than they are when transferred to the Museum; at the same time, they certainly perish and fade more at Pompeii than they do when removed to a drier situation in the Naples Museum.

New Public Offices for Calverley are proposed to be erected, and plans have been prepared. On the ground floor are shown an office for the clerk and collector, and one for the surveyor. On the first floor is shown a council chamber, measuring 26½ft. by 16½ft. and 13ft. high. On this floor are also a store-room for books and documents of the Council, a cloak-room, and the necessary sanitary conveniences. A house is also provided for one of the officials. Application will be made to the Local Government Board for sanction to borrow the sum of £3,500 for this and other improvement works.

The Bristol Society of Architects held its ordinary monthly meeting last week, Mr. F. W. Wills being in the chair. Before the business of the meeting, the president alluded to the death of Queen Victoria, who, as patron of the Royal Institute of Architects and the donor of an annual gold medal for the promotion of architecture, was directly connected with the profession. Mr. C. H. Samson, F.R.I.B.A., of Taunton, read a paper on "Church Restoration" which dealt with the practical work of church restoration as applied to the fine old village churches to be found in West Somerset. The lecturer strongly advocated the preservation of all old work, and insisted that any necessary new work should be simple in character and of the very best materials.

The Sheffield Society of Architects and Surveyors held a meeting last week, the President, Mr. Joseph Smith, being in the chair. The winners of prizes in the competition promoted by the Society for measured drawings of old buildings in the neighbourhood of Sheffield were announced. Mr. H. W. Inott won the society's prize of three guineas, and the president's prize of five guineas; Mr. J. Miller the second prize of two guineas, and Mr. E. R. Bower's drawing was highly commended. The drawings will be displayed in the Montgomery Hall at an early date. It was unanimously decided to forward an address to his Majesty, expressing their heartfelt sorrow at the lamented death of her Most Gracious Majesty Queen Victoria. Mr. H. H. Statham gave a lecture on "Our Cathedral Fronts: a Comparative Criticism."

Ayr new Town Hall Competition.—The Town Council at its last meeting received the report by Mr. John J. Burnet, A.R.S.A., Glasgow, on the designs submitted in competition for the restoration of Ayr Town Hall. Mr. Burnet reported that the arrangements, both of the Court-house and police department and of the hall in No. 1 design, appeared to him so good that he had no hesitation in placing it first. The Council unanimously adopted the recommendation of the assessor, and resolved to proceed with the erection of the hall. The successful design is that of Mr. J. Kennedy Hunter, architect, Ayr, and the cost of carrying it out will, according to the estimate of the measurers, Messrs. Douglas, Hunter and Whitson, Glasgow, amount to £9,515. The hall, with its principal accessories, will be comprised within the four walls of the original building, and its total seating accommodation will be 1,078. In connection with the police office, a new Court-room is to be provided, and there are also to be matron's room, production room, chief-constable's room, superintendent's room, and muster room.

Cardiff's New Asylum, the result of the competition for the plans of which was announced in last week's issue, is designed to receive 800 patients, and to be erected at a cost of £194,000. The architects are Messrs. Oatley and Skinner, of Edinburgh Chambers, Bristol, who designed Winwick Asylum in Lancashire at a cost of over £300,000, and the Croydon Asylum at a cost of £150,000. The structure will be rigidly plain. It will have overhanging eaves and will be constructed with red bricks, relieved with white or yellow bricks. Provision is made for an extension of the building and its accommodation to the extent of 1,250 patients; while the administrative block will be suitable to receive the whole of the staff for the larger building. The competing architects were required to send an estimate of costs for the first scheme and the extension, and these were arranged as follows:—

	For 800 patients. £	For 1,250 patients. £
Wells and Anderson	238,000	295,000
Greenaway and Newbury ..	226,000	300,000
Hooley and Sander	215,000	263,000
Law and Allen	208,000	251,000
Oatley and Skinner	194,000	235,000

Messrs. Oatley and Skinner estimate that the plans will not be ready for tenders before 18 months, of which time something like nine months will be taken up in corresponding with and the passing of the plans by the Lunacy Commissioners and the Local Government Board.

The Restoration of Macclesfield Parish Church is practically complete. The work has been carried out upon plans by the late Sir Arthur Blomfield, A.R.A., and has cost over £20,000. A Burne-Jones window for the Salvage Chapel has been given by Sir Thomas Wardle.

All Saints' Mission Church, Bradeley, near Smallthorne, was dedicated recently. The new church is a brick building to seat 190, from plans by Messrs. Wood and Hutchings, architects, of Burslem and Tunstall, the work being carried out by Mr. J. Longden, of Dale Hall, Burslem.

Swinton Public Baths Competition.—The Baths and Electricity Committee of the Swinton and Pendlebury Urban District Council have considered three competitive designs submitted for the proposed baths in Pendlebury Road, Swinton, and have decided to recommend the Council to adopt the design submitted by Mr. T. J. Bushell, architect, of Manchester, at a cost of £4,725. It is expected that application will shortly be made to the Local Government Board for sanction to a loan to purchase the site and erect the baths.

Local Government Annual, 1901.—The tenth issue of this handbook has just been published. The directory portion of the book has been amplified, and now provides ready means of reference to all branches of local government. The directory portion gives the names and addresses of the chief officials of all corporations, County Councils, &c., throughout the kingdom, and the abstract of the Local Government legislation of 1900 cannot fail to be of service. This year the book is sold at 1s. 6d. It is published at 2 Dorset Street, Fleet Street, E.C.

Metallic Decorations.—Messrs. B. Dellagana and Company, Limited, of 11 Shoe Lane, Fleet Street, E.C., are introducing a new form of metallic decoration. It consists of a electro-deposit of copper on a modelled surface of plaster, ware, wood or similar materials, and in conjunction with Messrs. George Roselieb and Son, of Kennington, a provisional patent has been obtained for a new process of producing high-relief undercut metal work. The electrical deposition of metals is of course no novelty, but Messrs. Dellagana feel satisfied that there is a market for their invention, which embodies the action referred to.

Three new Panels.—Mr. John Baker has introduced at Sledmere Church, Yorks, three panel designs commemorating current events. The first has for her late Majesty a mediæval crown (surmounted by the orb), interlaced by the V. monogram and a sceptre. Passing from behind is a scythe cutting through the V. and the sceptre. Inscribed on scrolls is—

AN. REG. LXIV. JAN. XXII. OBIIT.

The second panel bears the inscription—

A.D. MCMI.
VICTORIA OBIIT.
EDWARD VII. REX.

The third panel has crown and orb, like the first, two sceptres crossing behind, and the inscription—

EDWARDUS VII.
REX FACTUS EST.

Twelve Artizans' Dwellings at New Beckton have been erected by the East Ham District Council. These dwellings have been erected as an experiment, and if they can be made to pay, the Council have decided to proceed with the erection of 87 double-tenemented dwellings. Land has been purchased and propositions have been made for the erection of 255 houses in all. The houses now ready for occupation have cost about £450 each, and the scheme at first provided for each house to be let at a weekly rental of 11s. 3d. But at the last meeting of the committee the surveyor submitted particulars showing that there was a necessity for raising the rents, and the chairman of the committee explained that the state of the money market had necessitated the borrowing of money at 3¾ per cent., instead of 3 per cent., as had been estimated, which made a difference of 10d. a week in the rents. The poor, general district and water rates, and property tax were also responsible for a difference of 1s. 7d.

A new Board School at Lampeter is to be erected.

The Bristol Police Courts are to be extended. A site is being purchased at a cost of £5,025.

Buckingham Palace stands upon the site of the famous Mulberry Gardens, planted by James I. for the cultivation of silkworms. Later on these gardens became a fashionable resort, in fact the Cremorne of the seventeenth century. Buckingham House was built upon the site of Arlington House by the Duke of Buckingham.

Artisans' Dwellings at Stafford.—A Local Government Board enquiry was held recently into an application by the Stafford Town Council for the approval of the appropriation of land in Crooked Bridge Road as a site for the erection of thirty-one artisans' dwellings, and for sanction to borrow £6,500 for the erection of the dwellings.

Mr. William Johnson, of Howden, died last week, at the age of 71 years. In his earlier life he was assistant overseer and assessor of the township, but for many years past he was engaged in his profession of architect, surveyor, land agent and valuer. He was agent for Mr. Walter Freeman's Howden estate and held several other appointments.

A Bronze Statue of Queen Victoria standing in her royal robes, with crown and sceptre, has been unveiled at Hove. It was intended to commemorate the sixtieth anniversary of the accession of Queen Victoria, and is from a design by Mr. Thomas Brock, R.A. The pedestal is of Aberdeen granite, the sides of which contain bronze panels emblematical of Empire, Education, Art and Science, and Commerce.

In Holy Trinity Church, Windsor, a baptistery has been constructed as a memorial of the Rev. Arthur Robins, formerly rector of the parish. The chamber, which is in the Gothic style and is situated at the south-west end of the church, has open carved oak windows on its east side. The font stands in the middle of the tesselated pavement, and around the upper part of the walls is an inscription.

Public Baths at Bradford.—Mr. A. H. Tiltman, the consulting engineer to the Bradford Corporation, has arranged to supply the Local Government Board with plans of the proposed new central baths at the corner of Morley Street and Chester Street, which are to be so constructed as to be available in the winter months as a hall of assembly. In order to ascertain the nature of the foundations, borings have been commenced.

The Embroidering for the Queen's Chair of State for the opening of Parliament was done at the Royal School of Art Needle-work. The work is an exact reproduction of that on the throne occupied by her late Majesty at high Parliamentary functions during the last forty years. The back shows the quarterings of the Royal arms in gold and coloured silk on a ground of deep crimson velvet; and the Irish harp in gold silk with silver strings on a ground of deep sapphire blue velvet. The seat is richly embroidered, the Tudor rose in the centre worked in gold silk, and surrounded by a wealth of ornament in leafage, wild rose, and shamrock. For the other two Royal chairs, smaller than those of the King and Queen, a ducal crown was worked in gold silk.

Mr. Henry Willis who died on the 11th inst. was familiarly known as "Father Willis," on the analogy of "Father Smith," of whom he was a worthy successor in the art of organ-building. He was born April 27, 1821. Mr. Willis's first important step in the career of an organ-builder was the reconstruction of the organ of Gloucester Cathedral in 1847. The instrument shown at the Great Exhibition of 1851 brought Willis's work into prominent notice, and he was chosen to build the famous organ for St. George's Hall, Liverpool. Another organ, exhibited in 1862, was destroyed by fire at the Alexandra Palace in 1873; but the instrument by which Londoners know Willis best is the huge organ at the Albert Hall, opened 1871. Among the cathedrals of which the organs have been restored by Willis are Winchester, Carlisle, Wells, St. Paul's, Durham, Salisbury, Hereford, Oxford, St. David's and Canterbury.

Archæology in Greece.—The divers at Cerigo have discovered further statues, which cannot, however, be brought to the surface without improved apparatus. M. Caradias, Inspector-General of Antiquities, speaking before the Archæological Association at Athens on the recently discovered bronze statue of a youth expressed the opinion that it dates from the period of Phidias. It was the most perfect and beautiful relic of antiquity yet brought to light. The Minister of Public Instruction is going to Cerigo to superintend the researches.

New Companies.

H. Wheatley Limited.

Registered February 4th to carry on the business of carmen, builders, contractors, &c. Capital £100 in £1 shares. Registered office: 10-22 Windmill Road, Chiswick, Middlesex.

Howley Park and Great Tinsdale Quarry (Morley) Company, Limited.

Registered February 4th to acquire the business of the Howley Park Co-operative Quarry and Building Society, Limited. Capital £20,000 in 25s. shares. Registered office: Britannia Road, Morley, Yorkshire.

Armstrong's Brick Company, Limited.

Registered January 19th, to take over the business of a brickmaker, coal merchant, &c., now carried on by T. Armstrong, at Kingsthorpe, Northampton. Capital £6,000 in £1 shares. Registered office: 4 Hope's Place, Kingsthorpe Road, Northampton.

W. W. Jacques and Co., Limited.

Registered January 18th, 1900, to acquire the business carried on at 10 Parson's Green, Fulham, as W. W. Jacques and Co., and to carry on the business of stonemasons, builders, contractors, carmen, brick, timber and hardware merchants, &c. Capital £1,000 in £1 shares.

Cobridge Hall Fire-Clay and Marl Co., Ltd.

Registered February 4th to carry on the business of miners, quarry owners, brick makers, &c. Capital, £8,000 in £1 shares (4,750 preference). The first directors are Walter de Wolf and Thomas E. Storey. Registered office: Cobridge Hall, Sneyd Street, Cobridge, Staffordshire.

New Llandudno Junction Brick Syndicate, Ltd.

Registered February 8th to carry on the business of brick, tile, pipe, pottery, earthenware paviors, artificial stone makers, manufacturing chemists, &c. Capital £4,000 in £10 shares. Registered office: Wynnstay Chambers, Conway Road, Colwyn Bay, Denbigh.

Musson Pencil Company, Limited.

Registered February 6th to acquire from F. W. Musson, of 21 Great College Street, Westminster, certain existing inventions relating to improvements in pencils. Capital £6,000 in £1 shares. The first directors (to number not less than three nor more than five) are A. E. Hitchcock, J. K. George, and F. W. Musson. Qualification, 200 shares. Remuneration as fixed by the company.

Non-flammable Wood and Fabrics Co., Limited.

Registered January 12th, to acquire all or part of the business of the British Non-flammable Wood Company, Limited, and the London Non-flammable Wood Company, Limited, or either of them, to treat wood, fabrics and substances so as to render them incapable of supporting or spreading flame, and to carry on the business of timber merchants, saw-mill proprietors, wood-workers, carpenters, joiners, builders, shipowners, chemical manufacturers, and merchants, &c. Capital £195,000 in £1 shares. Registered office: 2 Army and Navy Mansions, Victoria Street, S.W.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
	BUILDING.		
Feb. 22	Clayton, near Bradford—Malting Premises	—	S. Spencer, 344 Great Horton Road, Bradford.
,, 22	Elland, Yorks.—Houses	Halifax Industrial Society	R. Horsfall and Son, 22A Commercial Street, Halifax.
,, 22	Workington—Additions, &c.	J. Jessop	W. G. Scott & Co., Victoria Buildings, Workington.
,, 22	Coventry—Bricks	Corporation (Gas Department)	G. Winstanley, Engineer, Gasworks, Coventry.
,, 22	Sheffield—Clinker Crusher House	Health Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
,, 22	Armagh—Premises	—	H. C. Parkinson, 11 College Street, Armagh.
,, 22	Walthamstow—Underground Convenience	Urban District Council	G. W. Holmes, Engineer, Town Hall, Walthamstow.
,, 22	New Wortley—Classrooms, &c.	Zion Sunday School Trustees	H. Banister, Hawthorne Terrace, Hull Lane, New Wortley.
,, 22	Abercarn, Mon.—Classroom, Lobby	Mynyddislwyn School Board	R. L. Roberts, Architect, Abercarn.
,, 23	Llwyncwtta, Rhayader—Dwelling House	—	J. H. Price, Llwyncwtta, Rhayader.
,, 23	Aberdeen—Chimney Stalk	Town Council	A. Smith, Engineer, Corporation Gasworks, Aberdeen.
,, 23	Broadstairs—Two Villas	R. Howell	J. Jarman, Elim, Crescent Road, Ramsgate.
,, 23	Wakefield—Boiler House	Council	City Surveyor, Town Hall, Wakefield.
,, 23	Walker, Northumberland—Pavilion	Urban District Council	T. W. Laycock, Council Offices, Church Street, Walker.
,, 23	Oswestry—Fire Station, Stables, Mortuary, &c.	Town Council	G. W. Lacey, Borough Engineer, Guildhall, Oswestry.
,, 23	Whitley, Northumberland—Bathing Place	Urban District Council	Council Offices, Whitley.
,, 23	Buxton—Retorts, Fireclay, Goods, &c.	Urban District Council	H. Barker, Gas Engineer, Town Hall, Buxton.
,, 23	Darwen, Lancs.—Fireclay, Retorts, Bricks, &c.	—	A. H. Smith, Gas Engineer, Darwen.
,, 25	Bradford—Chapel	—	Walker and Collinson, Architects, Swan Arcade, Bradford.
,, 25	Bristol—Centre	School Board	W. P. Saunders, Rupert Chambers, Quay Street, Bristol.
,, 25	Hove, Sussex—Alterations	—	H. H. Scott, Borough Surveyor, Town Hall, Hove.
,, 25	Omagh—Business Premises	B. M'Elhinny	M. Sellars, Architect and Surveyor, Omagh.
,, 25	Rawtenstall, Lancs—Church	—	Baptist Sunday School, Kay Street, Rawtenstall.
,, 25	Camborne—Residence	—	S. Hill, Architect, Green Lane, Redruth.
,, 25	Penyvai, near Bridgend—Church	—	R. W. Llewellyn, Baglan Cottage, Briton Ferry.
,, 25	Cheltenham—Shedding	Corporation	Borough Surveyor, Municipal Offices, Cheltenham.
,, 26	London—Fire Brigade Station	County Council	Architect's Department, 3 Warwick Street, Charing Cross, S.W.
,, 26	London, W.C.—Working-class Dwellings	County Council	Architect's Department, 18 Pall Mall East, S.W.
,, 26	Merthyr Tydfil—Rebuilding Inn	—	112 High Street, Myrthyr.
,, 26	Weston-super-Mare—Conveniences, &c.	Urban District Council	H. Nettleton, Surveyor, Town Hall, Nettleton.
,, 27	Bamford, Sheffield—Offices	Derwent Valley Water Board	E. Sandeman, Engineer, Bamford, Sheffield.
,, 27	Ramsgate—Walls	Corporation	T. G. Taylor, Borough Surveyor, Albion House, Ramsgate
,, 27	Bristol—Culvert	Corporation	T. H. Yabbicom, 63 Queen Square, Bristol.
,, 27	Minster—Laundry Buildings	Isle of Thanet Union Guardians	L. Grant, Architect, High Street, Sittingbourne.
,, 28	Sheffield—Infirmary Block	Sheffield Union	Union Offices, West Bar, Sheffield.
,, 28	Dublin—Lime, &c.	—	Barrack Master, Irish Constabulary Depôt, Phœnix Park, Dublin.
,, 28	Fir Vale, Sheffield—Workhouse Administrative Block	Sheffield Union Guardians	A. E. Booker, Clerk, Union Offices, West Bar, Sheffield.
,, 28	Wrexham—School Buildings	County School Governors	J. H. Phillips, Clive Chambers, Windsor Place, Cardiff.
,, 28	Walthamstow—Four Shops and Business Premises	Parochial Charities	W. A. Longmore, Bridge Chambers, Hoe Street, Walthamstow.
,, 28	Bradford—Wesleyan Chapel	—	Walker and Collinson, Architects, Swan Arcade, Bradford.
,, 28	Leeds—Extension of Wall	Corporation Property Committee	City Engineer, Municipal Offices, Leeds.
,, 28	Middlesbrough—Banking Premises	Yorkshire Banking Company	Bedford and Kitson, Greek Street Chambers, Leeds.
Mar. 1	London, S.W.—Portland Cement	County Council	Manager, L.C.C. Works Dept., Belvedere Road, Lambeth.
	ENGINEERING.		
Feb. 22	Glasgow—Car Equipments	Corporation	J. Young, 88 Renfield Street, Glasgow.
,, 23	Hitcham, Suffolk—Boring	Rural District Council	A. Newman, Clerk, Churchgate Street, Hadleigh.
,, 23	Great Houghton, Northants—Sinking Well	Rural District Council	J. Haviland, 2 St, Giles's Square, Northampton.
,, 25	Brighton—Arc Lamps, &c.	Town Council	F. J. Tillstone, Town Clerk, Town Hall, Brighton.
,, 25	Darwen, Lancs—Tramway Materials	Corporation	R. W. Smith-Saville, Borough Engineer, Darwen.
,, 25	London, S.E.—Switchboard, &c.	Bermondsey Borough Council	Town Hall, Spa Road, Bermondsey.
,, 25	Taunton—Tramway Plant	Corporation	Municipal Buildings, Taunton.
,, 25	Beckenham—Electricity Plant	Urban District Council	R. P. Wilson, 66 Victoria Street, Westminster.
,, 26	Ipswich—Extending Water Main	Burial Board	Burial Board Office, Ipswich.
,, 27	Bristol—Culvert	Corporation	City Engineer, Municipal Buildings, Bristol.
,, 27	Christiania, Norway—Trucks	State Railways Administration	Director, Machinery Department, 8 and 9 Jeinbanetervet, Christiania.
,, 27	York—Widening	North-Eastern Railway Company	W. J. Cudworth, Engineer, N.E.R. Station, York.
,, 27	York—Widening	North-Eastern Railway Company	C. A. Harrison, Central Station, Newcastle-on-Tyne.
,, 28	Wanstead, N.E.—Concrete Tanks, Sewage Filters, &c.	Urban District Council	J. T. Bressey, Surveyor, Council Offices, Wanstead, N.E.
,, 28	Wellington, New Zealand—Engines	Corporation	J. Duthie and Co., Limited, 23 Lime Street, London, E.C.
,, 28	Tipton, Staffs—Coke-conveying Plant	Gas Committee	H. O. Timmins, Engineer, Gas Works, Tipton.
28	Yeovil—Septic Tanks	Corporation	W. K. L. Armitage, Borough Surveyor, Municipal Offices, Yeovil.
Mar. 1	Swansea—Heating, &c.	Corporation	G. Bell, 13 Somerset Place, Swansea.
	IRON AND STEEL.		
Feb. 22	Coventry—Fencing	Gas Department	G. Winstanley, Engineer, Gas Works, Coventry.
,, 22	Glasgow—Rails	Corporation	J. Young, 88 Renfield Street, Glasgow.
,, 23	Bury, Lancs—Pipes, &c.	Bury and District Water Board	J. Cartwright, Peel Chambers, Market Place, Bury.
,, 25	Glasgow—Iron and Steel Work	Corporation	W. Foulis, 45 John Street, Glasgow.
,, 26	Barrow-in-Furness—Cast-iron Pipes, &c.	Corporation	Manager, Gas and Water Works, Barrow-in-Furness.
,, 28	London, N.E.—Gully Gates, Manhole Covers, &c.	Hackney Borough Council	Borough Engineer, Town Hall, Hackney.
,, 28	Leeds—Railings	Property Committee	City Engineer, Municipal Buildings, Leeds.
	PAINTING AND PLUMBING.		
Feb. 25	London, E.C.—Paints, Varnishes, &c.	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.
,, 25	Wombwell, Yorks.—Paint, White Lead, &c.	Urban District Council	J. Robinson, Urban District Council Offices, Wombwell.
,, 25	Notting Hill—Painting, &c. Works at Infirmary	St. Marylebone Guardians	Steward, Infirmary, Rackham Street, Notting Hill.
Feb. 26	London, E.C.—Red and White Lead, Paints, &c.	Southern Mahratta Railway Company	Company's Office, 46 Queen Anne's Gate, Westminster.
,, 26	London, S.W.—Painters' Materials	Westminster City Council	Town Hall, Charing Cross Road, W.C.
,, 28	London, N.E.—Oils, Paints, &c.	Hackney Borough Council	Borough Engineer, Town Hall, Hackney.
Mar. 1	Cairo—Paints, &c.	Barrage Administration	Barrage Administration, Cairo.
,, 8	Thirlmere Aqueduct, Manchester—Painting Bridges	Corporation	Secretary, Waterworks Offices, Town Hall, Manchester.
	ROADS AND CARTAGE.		
Feb. 22	Walthamstow—Granite Kerbs and Setts	Urban District Council	Surveyor's Office, Town Hall, Walthamstow.
,, 22	Hardingstone, Northants—Materials	Rural District Council	The Clerk, Council Offices, Hardingstone.
,, 22	Surbiton—Materials, &c.	Urban District Council	Council Offices, Ewell Road, Surbiton.
,, 22	Rhyl—Asphalting	Urban District Council	A. A. Goodall, Town Surveyor, Council Offices, Rhyl.
,, 22	Rawtenstall, Lancs—Materials	Corporation	Borough Surveyor, Municipal Offices, Rawtenstall.
,, 22	Wood Green—Granite, Gravel, Horses, &c.	Rural District Council	C. J. Gunyon, Surveyor, Town Hall, Wood Green, N.
,, 22	Wood Green—Making-up Roads	Rural District Council	C. J. Gunyon, Surveyor, Town Hall, Wood Green, N.
,, 23	Lewes—Materials, &c.	County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
,, 23	Hunslet, Leeds—Materials	Rural District Council	W. B. Pindar, Clerk, Glasshouse Street, Hunslet, Leeds.
,, 25	Beckenham—Guernsey Granite	Urban District Council	Council Offices, Beckenham.
,, 25	London, S.W.—Dust Vans	Wandsworth Borough Council	Council House, East Hill, Wandsworth.
,, 25	Llandaff—Materials, &c.	Rural District Council	J. Holden, 35 St. Mary Street, Cardiff.
,, 25	Sisley, Lincs—Granite and Slag	Rural District Council	J. M. Simpson, Clerk, Boston.
,, 25	London—Materials and Works	Camberwell Borough Council	W. Oxtoby, Engineer, Town Hall, Peckham Road, Camberwell.
,, 25	Beckenham—Guernsey Granite, Flints and Gravel	Urban District Council	Council Offices, Beckenham.
,, 25	Sheffield—Labour and Materials	Highway and Sewerage Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
,, 25	Hastings—Ragstone	Corporation	P. H. Palmer, Town Hall, Hastings.
,, 25	Hastings—Guernsey Granite	Corporation	P. H. Palmer, Town Hall, Hastings.
,, 26	Exmouth—Road Metal	Urban District Council	W. D. Harding, Town Surveyor, Council Offices, Exmouth.
,, 26	London, S.W.—Granite, Kerb, &c.	Westminster City Council	Town Hall, Charing Cross Road, W.C.
,, 26	Willesden—Road Widening	District Council	O. C. Robson, Engineer, Public Offices, Dyne Road, Kilburn, N.W.
,, 26	Barking Town—Flints and Broken Granite	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking.
,, 27	London, N.W.—Kentish Ragstone, &c.	Hampstead Borough Council	Borough Surveyor, Hampstead, N.W.
,, 27	Twickenham—Guernsey Granite, &c.	Urban District Council	T. W. Pearce, Surveyor, Town Hall, Twickenham.
,, 27	Hailsham—Materials, &c.	Rural District Council	E. Catt, Clerk, Church Street, Willingdon.
,, 28	London, N.E.—Broken Granite	Hackney Borough Council	Borough Engineer, Town Hall, Hackney.
,, 28	Thame, Oxon—Broken Granite	Rural District Council	J. Goodenough, District Surveyor, Thame, Oxon.
Mar. 1	Hampton Wick, Middlesex—Horsing Vans, &c.	Urban District Council	Council Offices, Hampton Wick.
,, 1	Withington, Lancs—Streets, &c.	Urban District Council	A. B. Mountain, Surveyor, Town Hall, Withington.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	SANITARY.		
Feb. 22	Nuneaton—Stoneware Pipes	——	J. S. Pickering, Council Offices, Nuneaton.
„ 23	Rugby—Sewer	Urban District Council	D. G. Macdonald, Surveyor, Rugby.
„ 25	Dartford—Disinfectants	Rural District Council	J. O. Hayward, Clerk, Sessions House, Dartford.
„ 25	Withington, Lancs—Sewers	Urban District Council	A. H. Mountain, Engineer to the Council, Town Hall, Withington.
„ 26	Llandaff—Scavenging	Rural District Council	J. Holden, 35 St. Mary Street, Cardiff.
„ 26	Steyning, Sussex—Scavenging	Rural District Council	E. Cripps, Clerk, Union Offices, New Shoreham.
„ 28	Shepton Mallet, Somerset—Drainage Works	Guardians	Master of the Workhouse, Shepton Mallet.
	TIMBER.		
Jan. 25	Romford—Firewood	——	W. Smith, Clerk, North Street, Romford.
„ 27	London, N.W.—Timber and Wheelwrights' Work	Hampstead Borough Council	Borough Surveyor, Town Hall, Hampstead,
„ 28	London, N.E.—Timber	Hackney Borough Council	Borough Engineer, Town Hall, Hackney.

COMING EVENTS.

Wednesday, February 20.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Ordinary meeting at 8 p.m.

INSTITUTION OF JUNIOR ENGINEERS.—Mr. A. H. Barker on "Works Management—II.", 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

SOCIETY OF ARTS.—Mr. Frederick McDermott on "Some Features of Railway Travelling, Past and Present," 8 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. J. Priestley, B.A., M.D., M.R.C.S., on "Duties of a Sanitary Inspector: General, (B)—Indoor,' 7 p.m. Inspection and demonstration in the district of St. George's, Hanover Square, 2 p.m. Conducted by Mr. Albert Taylor.

RUSKIN SOCIETY OF BIRMINGHAM.—Miss May Morris on "Patient Grizzel: some phases of women's life in mediæval times," 8 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Mr. W. Ferguson Irvine on "Some Old Halls in Wirral," 8 p.m.

Thursday, February 21.

CARPENTERS' HALL, London Wall.—Mr. H. Heathcote Statham on "Architecture at the Paris Exhibition," 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Mr. W. L. Magden on "The Electrical Power Bill of 1900: Before and After," 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

SOCIETY OF ARCHITECTS.—Mr. G. A. T. Middleton on "The Architecture of the Nineteenth Century," 8 p.m.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

NATIONAL SOCIETY FOR CHECKING THE ABUSES OF PUBLIC ADVERTISING.—General Meeting at the Society of Arts' premises, 5 p.m.

Friday, February 22.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. John G. Dunn on "The Practice of Chimney Building and Boiler Setting," 8 p.m.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. J. Osborne Smith on "Domestic Heating, Ventilation and Lighting," 7 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. J. Priestley, B.A., M.D., M.R.C.S., on "Duties of a Sanitary Inspector (C)—Offensive Trades and Trade Nuisances," &c., 7 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Professor Beresford Pite on "Stonework," 6.45 p.m.

ROYAL INSTITUTION.—Sir W. Roberts-Austen on "Metals as Fuel," 9 p.m.

INSTITUTION OF CIVIL ENGINEERS (Students' meeting).—Mr. J. L. Cridlan on "Automatic Couplings," 8 p.m.

Saturday, February 23

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration at Friern Barnet Sewage Works at 3 p.m., conducted by Mr. E. J. Reynolds, A.M.I.C.E

DUNDEE INSTITUTE OF ARCHITECTURE.—Visit to General Accident Assurance Buildings, &c., Perth, at 12.45 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Bruntsfield House and St. Oswald's Church.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Annual Dinner, King's Hall, Holborn Restaurant, 6 p.m.

Monday, February 25.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Announce Royal Gold Medallist. Address to Students by Mr. William Emerson, President. Criticism of the Designs and Drawings submitted for Prizes and Studentships, by Mr. J. Alfred Gotch. Presentation of Prizes, 8 p.m.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 8 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. Henry R. Kenwood, M.B., D.P.H., on "Infectious Diseases," 7 p.m.

ROYAL INSTITUTION.—Professor J. A. Ewing on "Practical Mechanics," VI., 3 p.m.

PHILOSOPHICAL SOCIETY OF GLASGOW: ARCHITECTURAL ASSOCIATION.—Professor Henderson, B.Sc., M.A., on "Chemical Notes on Building Materials," 8 p.m.

Wednesday, February 27.

EDINBURGH ARCHITECTURAL SOCIETY.—Mr. Percy E. Nobbs, M.A., on "Why we go to Italy,' 8 p.m.

SOCIETY OF ARTS.—Dr. W. Schlich, C.I.E., on "The Outlook for the World's Timber Supply," 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. Algernon Barker, B.A., on "Legal Topics of Interest to Architects and Surveyors," 7.30 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. Henry R. Kenwood M.B., D.P.H., on "Methods of Disinfection," 7 p.m. Inspection and Demonstration at Common Lodging House, at 3 p.m.

CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Hay, best	per load	4	0	0	4	7	6
Sainfoin mixture	do.	3	10	0	4	10	0
Clover, best	do.	4	5	0	5	0	0
Beans	per qr.	1	10	0	—		
Straw	per load	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	12	8	—		
Colza Oil, English	do.	1	7	0	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	0	6	—		
Lead, white, ground, carbonate	do.	1	4	10	—		
Do. red	do.	1	0	4½	—		
Linseed Oil, barrels	do.	1	6	0	—		
Petroleum, American	per gal.	0	0	6⅝	0	0	6¾
Do. Russian	do.	0	0	6¼	0	0	6⅜
Pitch	per barrel	0	7	6	—		
Shellac, orange	per cwt.	3	0	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	5	0	1	5	6
Tar, Stockholm	per barrel	1	8	0	—		
Turpentine	per cwt.	1	8	3	1	8	6

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	86	0	0	—		
Iron, Staffs., bar	do.	7	0	0	9	10	0
Do. Galvanised Corrugated sheet	do.	11	10	0	12	0	0
Lead, pig, Spanish	do.	14	17	6	15	0	0
Do. do. English common brands	do.	15	7	6	15	10	0
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	21	0	0	22	0	0
Do. pipe	do.	23	0	0	—		
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do., floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	7	0	0	7	10	0
Do. Mild Bars	do.	7	10	0	8	0	0
Tin, Foreign	do.	122	15	0	122	3	5
Do. English ingots	do.	127	0	0	—		
Zinc, sheets, Silesian	do.	21	0	0	—		
Do. do. Vieille Montaigne	do.	21	12	6	—		
Do. Spelter	do.	17	10	0	18	2	6

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Do. Pitch	do.	2	10	0	3	15	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P. Std.	10	10	0	17	5	0
Do. do. 4th & 3rd	do.	9	5	0	13	15	0
Do. do. unsorted	do.	—			—		
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	15	0	15	5	0
Do. do. 2nd „	do.	8	15	0	14	15	0
Do. do. Unsorted „	do.	5	5	0	13	0	0
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	8	10	0	16	15	0
Do. White Sea	do.	10	0	0	11	15	0
Do. Quebec Pine, 1st	do.	23	10	0	28	5	0
Do. do. 2nd	per P. Std.	19	15	0	—		
Do. do. 3rd &c.	do.	11	15	0	—		
Do. Canadian Spruce, 1st	do.	12	5	0	12	15	0
Do. do. 3rd & 2nd	do.	9	10	0	10	5	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	8	0	0	12	0	0
Flooring Boards, 1in. prepared, 1st	per square	0	11	6	—		
Do. 2nd	do.	0	9	3	—		
Do. 3rd &c.	do.	0	8	9	0	9	0

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the Work

ALDERSHOT.—For erection at their sanatorium of a ward block, discharging ward, and additions to the administrative building, for the Aldershot Urban District Council. Mr. Nelson F. Dennis, surveyor:—

G. Kemp, Aldershot	£2,559	M. Bateman, Ash, Surrey*	£2,825
W. Garland, Aldershot	2,875		
J. Hughes, Aldershot	2,850		

* Accepted.

[Surveyor's estimate, £2,420.

GRIMSBY.—For the erection of four shops, Pasture Street, for Messrs. Hewitt Bros., Lim. Mr. Herbert C. Scaping, architect, Court Chambers, Grimsby. Quantities by Mr. I. Watson, Hull:—

G. & I. Smith	£2,800 0 0	H. Marrows	£2,561 15 6
Thompson & Sons	2,800 0 0	Wm. Ion	2,527 10 0
Hewins & Goodhand	2,763 12 0	Gilbert & Kirton *	2,478 4 1

* Accepted.

HIGH WYCOMBE.—For the erection of new billiard room and additions, Hill Side. Mr. Arthur Vernon, 29 Cockspur Street, London, S.W., and High Wycombe, architect:—

Hunt & Son	£1,365	G. H. Gibson *	£1,265

* Accepted.

LEYTON, Essex.—For constructing about 480 yds. of 3ft. 6in. diameter circular surface water culvert, 1,080 yds. of 2ft. 6in. diameter circular sewer culvert in 9in. brickwork, and 640 yds. of 18in. diameter, and 620 yds. of 12in. diameter stoneware pipe surface-water drain, for the Leyton Urban District Council. Mr. William Dawson, M.I.C.E., surveyor:—

Pedrette & Co., Finsbury Park	£7,860 10 0
G. Bell, Tottenham	7,773 15 0
Wilkinson Bros., Thomas Road, Finsbury Park	7,720 4 0
Killingback & Co., Camden Town	7,123 15 0
T. Adams, Green Lanes Station, Wood Green	7,008 0 0
G. Wilson, Walthamstow	6,988 16 8
W. Griffiths & Co., Bishopsgate Street, E.C.	6,987 11 0
G. J. Anderson, 26 North Street, Poplar	6,393 6 6
W. Manders, Leyton	6,348 19 2
R. Ballard, Lim., Child's Hill, N.W.	6,295 10 0
J. Jackson, Broadway, Plaistow	6,260 17 8
F. J. Coxhead,* 45 Bulwer Road, Leytonstone	5,986 15 6

* Accepted.

LONDON.—For drainage and sanitary work at Ponton Road School, for the London School Board. Mr. T. J. Bailey, architect:—

Rice & Son	£2,390 0 0	W. Hammond	£2,219 4 5
Lathey Bros.	2,362 0 0	J. & C. Bowyer	2,151 0 0
W. Johnson & Co., Lim.	2,343 0 0	H. & G. Mallett	1,944 9 3
Maxwell Bros.	2,321 16 8	W. V. Goad	1,850 0 0
Martin, Wells & Co.	2,224 0 0	E. Triggs *	1,840 0 0

* Recommended for acceptance.

LONDON.—For the erection of manual training centre for 40 boys at Fossdene Road School, for the London School Board. Mr. T. J. Bailey, architect:—

J. Garrett & Son	£1,450	Kirk & Randall	£1,378
W. King & Son	1,448	W. Johnson & Co., Lim.	1,355
F. & H. F. Higgs	1,419	E. Triggs	1,297
E. P. Bulled & Co.	1,385	J. & C. Bowyer *	1,293

* Recommended for acceptance.

LONDON.—For the erection of new school for infants, George Street, for the London School Board. Mr. T. J. Bailey, architect:—

		A.
H. Wall & Co.	£8,001	£129
E. P. Bulled & Co.	7,979	90
Johnson & Co.	7,840	120
F. & H. F. Higgs	7,492	88
G. E. Wallis & Sons	7,182	67
J. Appleby	7,174	95
W. Downs	7,069	125
Holliday & Greenwood	7,039	79
J. & C. Bowyer	6,393	72
W. Smith	6,381	76
J. Marsland & Sons *	6,133	60

A.—Add if walls of classrooms are plastered.
* Recommended for acceptance.

LONDON.—For the erection of laundry centre on arches at Buckingham Terrace School, for the London School Board. Mr. T. J. Bailey, architect:—

Leslie & Co., Lim.	£1,810	W. King & Son	£1,571
Holloway Bros.	1,794	E. Triggs	1,543
W. H. Lorden & Son	1,750	Lathey Bros.*	1,495
C. Wall	1,700		

* Recommended for accceptance.

LONDON.—For the erection of a special school for 60 children, &c., Trafalgar Square, for the London School Board. Mr. T. J. Bailey, architect:—

Leslie & Co.	£5,583	G. Munday & Sons	5,476
Treasure & Son	5,572	E. Lawrance & Sons	5,228
Perry & Co.	5,530	H. Wall & Co.	5,199
L. H. & R. Roberts	5,516	Staines & Son	5,181
J. Grover & Son	5,502	W. Gregar & Son	5,157
F. & F. J. Wood	5,491	J. Chessum & Sons *	4,998

* Recommended for acceptance.

LONDON.—For removing one building from Ambler Road, one from Clifton Road, one from Eltringham Street, and three blocks of offices from Rosendale Road, and re-erecting them on the Macmurdo Road site, for the London School Board. Mr. T. J. Bailey, architect:—

T. Cruwys	£1,665	J. Mitson & Co.	£1,280
J. & W. T. Hunter	1,365	T. J. Hawkins & Co.	1,185
Croggon & Co., Lim.	1,310	W. Harbrow *	1,173

* Recommended for acceptance.

NEWPORT, Mon.—For the erection of new Council Chambers and offices, Newport, Mon., for the Monmouthshire County Council. Mr. W. Tanner, county surveyor:—

Jones Bros., Cardiff	£10,335	J. Moore	8,830
A. E. Parfitt	9,900	C. H. Reed	8,800
Bowers & Co., Hereford	9,570	W. A. Linton	8,780
T. G. Diamond	9,500	C. Jordan	8,697
A. S. Morgan	9,161	D. W. Richards & Co.,* Newport, Mon.	8,470
J. Linton	9,140		
W. M. Blackburn	8,995		

* Accepted.

OKEHAMPTON, Devon.—For supplying and laying about 4,880yds. of 4in. cast-iron water-main; also the construction of a dam, filter-beds and other work in connection therewith, for the Okehampton Town Council. Mr. J. Archibald Lucas, F.S.I., Exeter and Okehampton, engineer:—

T. Shaddock, Byntirion, Plymouth	£3,225
Hawking & Best, Teignmouth	2,925
W. Shaddock, Byntirion, Plymouth	2,786
Berry, Crediton	2,668
Neal, Princess Square, Plymouth	2,640
Ball, East Street, Okehampton	2,528
Fisher, North Tawton	2,494
Bickle, Lydford	2,300
Harris, Sheephill, Okehampton	2,190
C. Brealey,* 58 Cowich Street, St. Thomas, Exeter	2,121

* Accepted.

PORTSMOUTH.—For alterations and additions to the Highland Road Board School, Southsea, for the Portsmouth School Board. Mr. A. H. Bone, Cambridge Junction, Portsmouth, architect:—

H Coles, Rugby Road, Southsea	£6,550	0	0
M. Coltherup, Lombard Street, Portsmouth	6,490	0	0
W. Carline, Somers Road, Southsea	6,293	4	10
S. Salter, King's Road, Southsea	6,270	0	0
W. W. Learmouth, Emsworth Road, Portsmouth	5,700	0	0
Clark & Son, Claxton Street, Landport	5,530	0	0
T. W. Quick, Junction Road, Southsea	5,250	0	0
J. Harding, Victoria Road, North Southsea	5,210	0	0
H. Jones, Broad Street, Southsea	5,190	0	0
J. Crockerell,* Victoria Road, North Southsea	4,868	0	0

* Recommended for acceptance.

SHEFFIELD.—For alterations and additions to the Howard Hotel, Howard Street, Sheffield, for Messrs. the Directors of Thomas Rawson & Co., Limited. Messrs. Hall & Fenton, 14 St. James Row, Sheffield, architects and surveyors. Quantities by the architects:—

G. H. May, Rotherham	£1,784	8	5
W. H. Bowden, Glossop	1,719	0	0
G. Vaughan, Valley Road	1,609	0	0
J. D. Lilleker, Alma Street	1,507	8	0
A. Turner, Rockingham Street	1,490	0	0
A. Bradbury, Cemetery Road	1,469	0	0
Bee & Son, London Road South	1,402	0	0
T. Margerrison, Church Street, Dronfield	1,388	0	0
G. & C. Earl, Valley Road, Meersbrook	1,378	0	0
C. H. Gillam, Sharrow Lane	1,270	0	0
J. S. Teanby,* 72 Carterknowle Road	1,240	0	0

* Accepted. [Rest of Sheffield.]

SOUTH SHIELDS.—Accepted for alterations to premises, No 7 Victoria Terrace, for Mr. John Chotton, jun. Mr. Henry Grieves, A.R.I.B.A., architect, Albany Chambers, South Shields.

General Trades.—M. Hall, jun., South Shields	£225	0
Encaustic Tiling.—Henry Walker & Son, Newcastle-on-Tyne	74	5
Granite Work.—J. B. Farbridge & Son, South Shields	45	10
	£344	15

STANLEY, Durham.—For the execution of the various works to be carried out in the formation of carriage-way and foot-path on the Oxhill Road, including macadamising, kerb, and channelling, asphalting, and the taking down and rebuilding of stone walls, for the Stanley Urban District Council. Mr. Joseph Routledge, surveyor:—

E. Moesch, Bensham	£2,293	4	0
W. Plews, Ashington	2,162	17	8
W. Skelton, Gateshead	1,818	6	8
G. T. Manners, Durham	1,806	0	0
G. E. Simpson, Newcastle-on-Tyne	1,487	8	5
D. Young, Hexham	1,452	8	8
A. Routledge,* Stanley	1,339	7	11

* Accepted.

SWANLEY, Kent.—For the erection of the White Oak School, Swanley, for the Metropolitan Asylums Board:—

Balaam Bros., Shenton Street, Old Kent Road, S.E.	£151,256
Leslie & Co., Limited, Kensington Square, W.	141,450
Foster & Dicksee, Rugby	140,270
R. L. Tonge, Kingsfield, Watford, Herts	138,652
Stephens, Bastow & Co., Limited, Montpelier, Bristol	135,229
B. E. Nightingale, Albert Embankment, S.E.	133,227
J. Willmott & Sons, Hitchin, Herts	122,915
W. H. Lorden & Son, Trinity Road, Upper Tooting, S.W.	121,888
J. J. Wise, Queen Street, Deal	116,035
Martin, Wells & Co., 25 Auckland Street, Vauxhall, S.E.	115,000
C. Wall,* Ashburnham Works, Chelsea, S.W.	112,324

* Accepted. [Architect's revised estimate, £115,000.]

TONBRIDGE, Kent.—For new fire station, public convenience, mortuary, &c., for the Tonbridge Urban District Council. Mr. W. L. Bradley, surveyor:—

K. C. Jarvis	£2,395
Martin & Co.	2,340
Wallis & Sons, Maidstone	2,294
Strange & Sons	2,293
J. C. Elkington	£2,079
Punnett & Son	1,974
J. Jarvis,* Tunbridge Wells	1,970

Surveyor's estimate, £1,982.

* Accepted. [Rest of Tonbridge.]

TREDEGAR, Mon.—For erection of a chapel and schoolroom in Commercial Road, Tredegar, for the Primitive Methodist Church. Mr. W. S. Williams, Elmwood, Tredegar, architect:—

R. Edwards,* 84 Queen Street	£1,460
D. J. Vaughan,† Commercial Road	1,322

* Accepted. † Withdrawn.

WATFORD.—For extension of Watford Post Office, for H.M. Office of Works, &c.:—

				A.		
R. L. Tonge	£1,949	0	0	£11	10	0
C. Jackson	1,804	18	6	—		
C. Eames	1,699	0	0	17	0	0
C. Brightman	1,680	0	0	20	0	0
W. Judge	1,641	0	0	—		
G. & J. Waterman	1,629	0	0	17	0	0
E. West	1,599	0	0	—		
F. Dupont & Co.	1,490	0	0	10	0	0
J. L Tyler	1,471	0	0	11	0	0
G. Wiggs	1,846	0	0	14	10	0

A. Old materials.

WORTHING.—For supply and erection of a main switchboard, for the Corporation:—

Crompton & Co., Limited	£1,730
Nalder Bros. & Thompson, Limited	1,450
Heaton & Smith, Limited	1,434
Siemens Bros.	1,293
General Electric Company	1,285
Cox & Walkers	1,205
Mechens & Sons	1,200
Brush Electric Company	1,075
Cowans, Limited	1,050
Williamson & Joseph, Limited	1,040
Lea & Warren	1,035
Blackwell & Co., Limited	1,032
Spagnoletti & Crookes	1,030
John Fowler & Co. (Leeds), Limited*	1,015
W. J. Fryer & Co.	806

* Accepted.

CONTRACTS OPEN.

BOROUGH of CAMBERWELL.

ANNUAL CONTRACTS.

The Works and General Purposes Committee of this Council will meet at the Town Hall, Peckham Road, on MONDAY, the 25th day of FEBRUARY inst., at SEVEN o'clock in the evening precisely, to receive TENDERS for the requisite MATERIALS and WORKS in connection with the following: Guernsey Granite, Croydon and Kent Flint, Kentish Rag Stone, Paving Stone, Thames Ballast, Tarpaving, Asphalting, Lime and Cement, Timber for Wheelwrights' Work, Harness Leather, Materials and Fittings, Loin Cloths, Sacks, &c., White and Red Lead, Paniters' Sundries, Oilmen's Sundries, Lard Oil, Tallow, Candles, Soap, &c. Hire of Drivers, Horses, Carts, &c. Brooms and Brushes, Shovels, Pickaxes and other Tools, Shoeing and Bar Iron, Steel, &c. Coach and General Ironmongery, Gas Fittings, Tyreing, Coal and Coke, Clock Winding, &c.

The Public Health Committee of this Council will meet at the Town Hall, Peckham Road, on TUESDAY, the 26th day of FEBRUARY inst., at SEVEN o'clock in the evening precisely, to receive TENDERS for the SUPPLY of DRAIN PIPES, SEWER IRONWORK, and also for the SUPPLY of CARBOLIC POWDER, DISINFECTANTS, &c.

Forms of Tender and all particulars may be obtained from the Borough Engineer, Mr. W. OXTOBY, Town Hall, Peckham Road, Camberwell, and no Tender will be received except on such form.

Tenders are to be delivered at the Town Hall, Camberwell, at the times and dates first above-mentioned, when Contractors or their Agents are required to be in attendance.

The Council does not bind itself to accept the lowest or any Tender.

Approved sureties will be required for the due performance of the contract.

Persons tendering must comply with the conditions as regards rates of wages and hours of labour as contained in the form of contract and schedule annexed to the Tender.

By order,
C. WILLIAM TAGG,
Vestry Clerk.

Town Hall, Camberwell,
February, 1901.

TO BUILDERS and CONTRACTORS.

The Feltham School Board are prepared to receive TENDERS for the ERECTION of a NEW INFANTS' SCHOOL, on the Cardinal Estate, Feltham, about 50ft. from the present infants' school.

Plans, specifications, conditions of contract, and quantities, may be seen at the office of Mr. W. RALPH LOW, architect, 10 Basinghall Street, London, E.C., between the hours of TEN a.m. and SIX p.m. Saturdays TEN a.m. to TWO p.m. Copies of quantities can be obtained upon payment of a deposit of Two Guineas, which deposit will be returned on receipt of a bonâ fide Tender on the form supplied with the quantities.

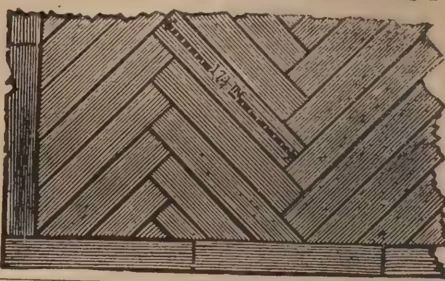
Tenders to be delivered, on the forms supplied, at the office of the Clerk to the Board on FRIDAY, MARCH 22nd, 1901, not later than TWELVE noon, marked outside "Tender for Infants' School."

The Board do not bind themselves to accept the lowest or any Tender or to defray any expense in connection with tendering, and whatever Tender may be selected will be subject to the approval of the Board of Education before its acceptance.

Substantial sureties will be required for the due fulfilment of the contract.

By order,
OSWALD JACOB,
Clerk to the Board.

Feltham, Middlesex,
February 1901.



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	At Wharf.	ex Ship within one month.	At Wharf.
17½×3×3	13 8	12 9	20 0
17½×3×2	8 11	8 2	14 6
17½×3×1½	6 10	6 3	10 9

PRIME DRY OAK & PITCH PINE FLOORING,
With Special Joint to conceal Nails—
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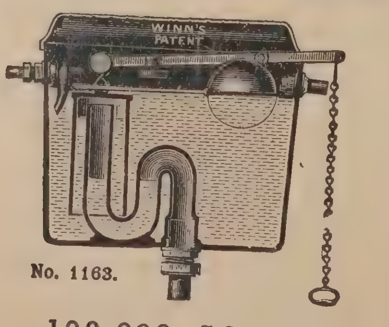
SYPHON CISTERN.



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A Large Stock on hand.
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THE BUILDERS' JOURNAL
& ARCHITECTURAL RECORD

FEBRUARY 27, 1901.
No. CCCXVI.

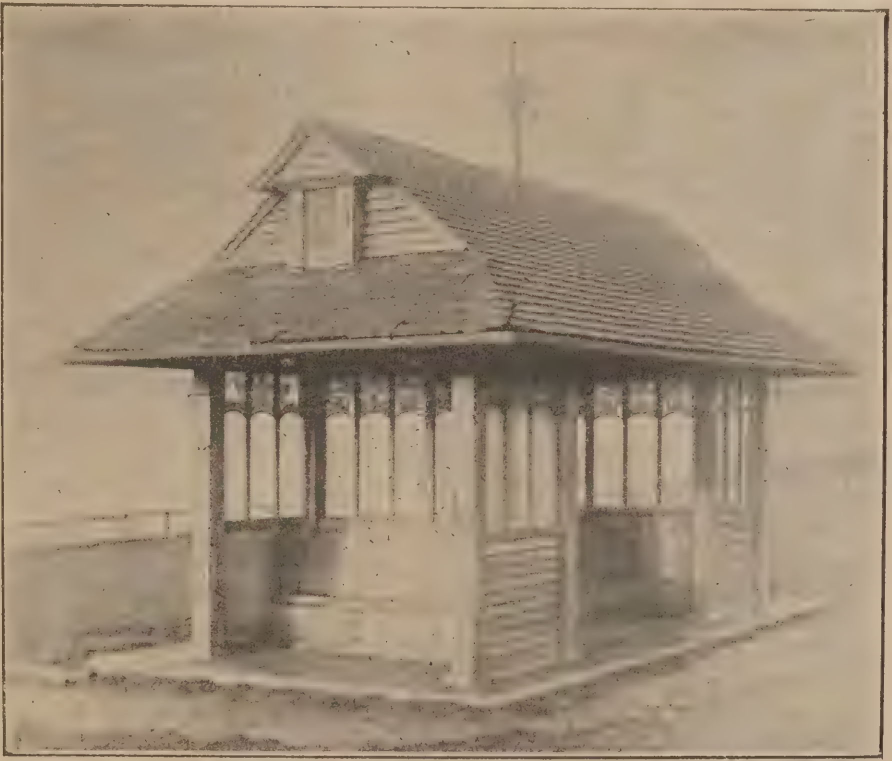
EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

An Architectural Causerie.

Rights Affecting Architectural Drawings. ON referring to page 67 of this issue it will be seen that a correspondent raises a very interesting and important question in regard to the preparation of architectural drawings. Let it be supposed that a so-called architect commissions another man to prepare designs for a hospital competition. These designs gain the first premium and the work is carried out in the architect's name. The question is, can the man who really made the drawings use them for publication as a design apart from the architect, attaching his own name to them and making no mention of the architect? This is our correspondent's case. The point is a nice one and is entirely dependent on the exact conditions under which the work was done. Copyright law is affected, and it must not be forgotten that such law is most abstruse, though Lord Monkswell's Bill has certainly brought order out of chaos. In the case of pictures, at the present time the copyright rests with the artist unless he assigns it in writing. In the case mentioned there appears to have been no agreement in writing, but simply a verbal arrangement by which the one man was to prepare designs for the other at an agreed price. Did these designs so become the absolute property of the architect? We think so. But there is still the question of specific use. Were the designs made for the purposes of the competition only, leaving all other rights in the hands of the author? As no definite statement to this effect is made, we should think not. According to our view of this matter, all the rights became vested in the architect when he paid for the drawings; he practically bought the designs *in toto* and so acquired absolute possession of them. In all cases of this kind particular care should be taken to have an agreement in writing, stating exactly what rights are assigned. An interesting side issue is also raised—that of the architectural "ghost." We have already condemned this practice, by which one man reaps the results of another's handiwork. It has a degrading influence on both, and the evil is accentuated when a so-called architect attaches his name to drawings with which he had nothing whatever to do. The next development will be for certain men to keep designs for hospitals, town halls and free libraries of all sizes and shapes in stock, so that everyone can choose one to meet his own particular needs. A catalogue would also be useful—No. 232. Nice town hall. Brick and terra-cotta. All the latest improvements. Plenty of ornament. Would suit pushing young municipality. Plans sent on approval.—Let architecture be spared this at least.

Public Shelter: Hunstanton, St. Edmunds. THIS shelter has been recently built on the cliff in memory of the late Francis Hewitt of Leicester and Hunstanton, for some time president of the Press Association. It is constructed of English oak and roofed with red tiles. The lead glazing, which represents marine animals, birds and plants, more or less conventionalised, was made by Messrs. Nicholls and Clarke, of London, from designs by the architect, Mr. Herbert Ibberson, F.R.I.B.A. The builder was Mr. F. Southgate, of Hunstanton. Our illustration is from a photograph by Miss G. Hewitt.

London Water Proposals. THE London water companies are very ingenious in their arguments, but they excel themselves in trying to foist on the ratepayers a number of expensive new regulations. It is to be hoped that Mr. Long will quash the scheme. No doubt a large amount of water is wasted, but that is no reason why householders should be compelled (among other things) to provide cisterns, which have proved to be so insanitary in the past. It is well enough to say that these are perfectly satisfactory if cleaned, but they are often not easy to clean, and in many cases are never touched, whether it is easy to clean them or not. Moreover, the water companies want to have a box outside each house so that they can turn off the water when they like; but the consumer prefers otherwise. He does not like to find when he awakes that the water has been turned off for him during the night. No, people have had enough of intermittent supplies, and rightly so. Water supply should be constant, but if the companies manage to have the cisterns replaced in houses they will probably revert to the intermittent supply. It is better to have a waste of water than this: and as regards this waste the companies seem to think that people let their taps run for fun, which is absurb. The London water companies should never have been allowed to obtain the authority they now possess; such power should be taken away from them and the water supply municipalised. These new regulations exemplify the arbitrariness of the companies, who would obtain all the benefits while the consumers were loaded with the expense and inconvenience.



SHELTER AT HUNSTANTON. HERBERT IBBERSON, F.R.I.B.A., ARCHITECT.

The Preservation of Stonehenge. IT will be remembered that a short time ago two stones fell at Stonehenge, one being smashed. Several suggestions were made for the preservation of the whole group, and the matter is now receiving the consideration of a committee of well-known archæologists, in whose hands we are sure no vandalism will be permitted. Perhaps the most interesting letter that has recently appeared on this subject comes from Professor Flinders Petrie, who is now in Upper Egypt restoring the beginnings of the oldest known civilisation. He says in the "Times" that Stonehenge is the most impressive sight in England, "and on no account should it be destroyed by a hideous iron railing, such as now defaces Kits Coty house." In his opinion it would be of no benefit to the appearance of the place or to archæology if every stone that has fallen were re-erected. The real effort should be to save those now gradually yielding over, especially the largest stone of all. "When leaning stones have been pushed up into place, then all the unstable ones should have a concrete bed filled in, below the turf level, as I proposed twenty years ago. The whole soil under a stone might be removed while the block was clamped in a timber frame." We entirely agree with this scheme, as it is certainly the most effective way of dealing with the stones: it is always the foundations that need primarily to be made sound. Such work as that proposed would afford the chance for a historical research. The Professor says that not a handful of soil must be moved except under the instant inspection of a good archæologist, who must live in a shed at the site. There must be no driving up each day from an hotel at Salisbury, to find that the workmen have finished with the historical evidences before breakfast. The workmen must be trained hands, and full local value must be paid to them for everything they find; there must be no chance tales a year or two later about so-and-so having got prizes from the excavations. A perfect record of every scrap, even of pottery, must be kept, and the ground cut away in such measured slices that the place of every object is known to an inch. The public must be kept out from all interference with the portion being worked, and no festive luncheons and notabilities must be allowed to distract the recorder for a moment. Professor Petrie speaks from a bitter experience no doubt, and we hope that, as he suggests, he will be able to co-operate in a plan for the thorough repair of these wonderfu stones of Stonehenge.

Mr. Balfour's Scheme. WE should have thought Mr. Balfour would have had more sense than to suggest, as a solution of the housing problem, "a system of radiating thoroughfares, confined to traffic running at the rate of fifteen miles an hour or over—this is absolutely essential—and with a surface designed, not for carts or horses, but for some form of auto-car propulsion." We certainly believe that the solution of the housing problem lies not inside the city but outside, means of quick transit being essential; but what corporation is likely to attempt such a scheme as Mr. Balfour's? In the first place it would mean the demolition (in London, at an enormous expense) of a great amount of valuable property in order to form these "radiating thoroughfares," and in the second place we do not think it practicable for dozens of motor-cars to be rushing along beside or behind one another at a speed of nearly twenty miles an hour. At the present time the numerous railways afford ready means of transit and the companies should be compelled to issue tickets to workmen at cheaper rates and establish a more constant service. Horse trams are of little use, their speed being altogether inadequate: horse 'busses are a little better; but rapid electric cars are needed to supplement the railway service. It is useless to suggest a scheme like Mr. Balfour's.

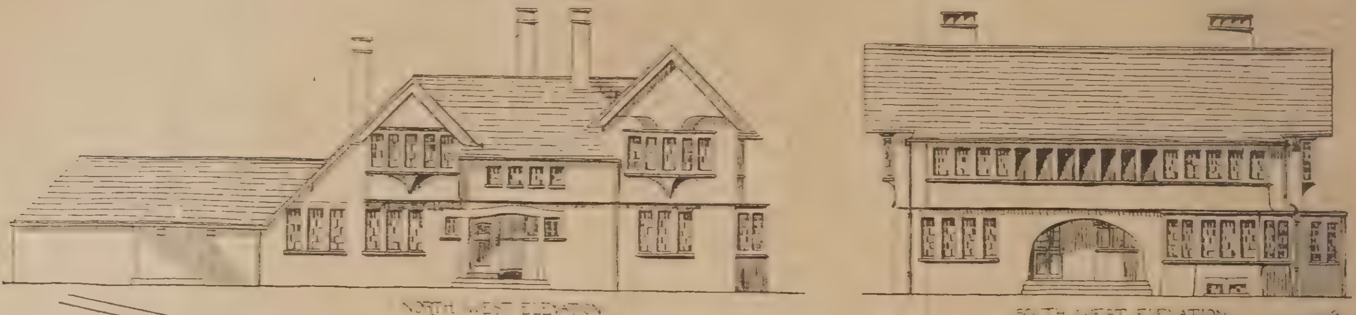
THE ART OF DESIGNING SMALL HOUSES AND COTTAGES.*

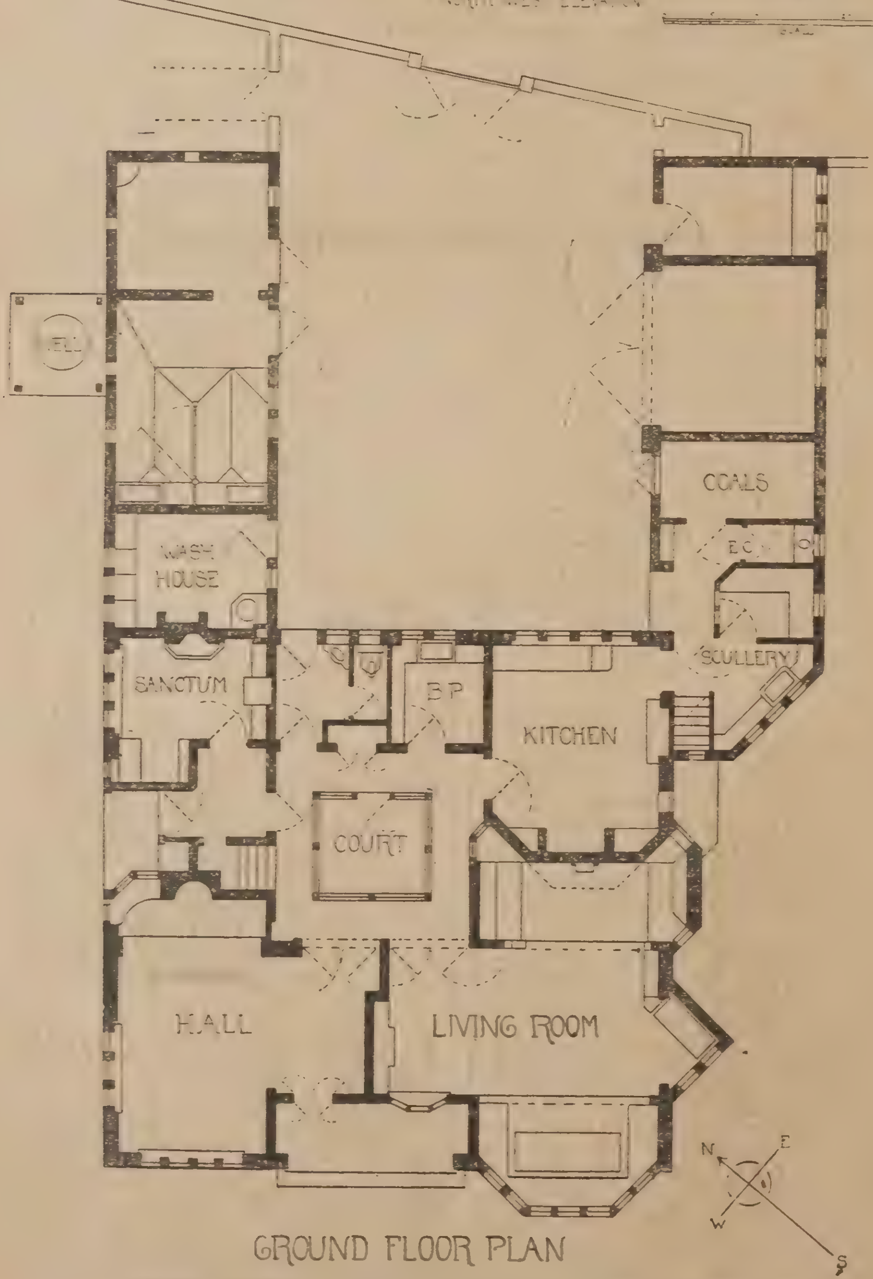
By BARRY PARKER AND RAYMOND UNWIN.

IN no house can every advantage be obtained; each must be somewhat of a compromise; in each there must be a sacrificing of what we deem the less important to secure what we esteem of greater value. It follows that the variety of our attitude must produce individuality in the results.

Suppose we have received a commission for a dwelling house. The first thing is to visit the site and devote some time to thinking out the problem on the spot. The site is the most important factor to be considered, for it usually suggests both the internal arrangement and the external treatment. If the site is a large one the position of the house upon it must first be determined. A primary consideration must be to so place the house as to afford its occupants the greatest possible enjoyment of such beauty of adjacent country or grandeur of distant view as the site can command. While doing this, however, we must so place and design the house that it shall not stand out as a disturbing excrescence, but shall look at home in its place, in harmony with its surroundings.

This consideration of the house as a detail in a larger picture will bring us to a determination of its general form, its treatment and its colouring. Some positions demand a lofty building to crown or complete a spur of rising ground, for example, while others seem to suggest that it be kept as low as possible, as when it nestles under some protecting hill-side. And in the country at any rate the low house is usually more successful. Some natural terrace may suggest a long house with all its rooms facing one way, or a ridge may indicate a double-faced house commanding the outlook over each slope, or perhaps a steep hill-side will require a house following its lines and clinging to it storey by storey, while a gentle slope will demand a general grouping of the roofs to give a sense of stability by contradicting it.





GROUND FLOOR PLAN

COUNTRY HOUSE IN NORTH STAFFORDSHIRE. BARRY PARKER AND RAYMOND UNWIN, ARCHITECTS.

In the choice of materials and colouring, harmony rather than strong contrast should be sought. There is only one sure way of obtaining this at all generally, which is of course to keep to local materials and local ways of using them. In some places a low-toned colour-scheme, such as stone walls and grey stone or slate roof, seems most fitting, in others the warmth and brightness of bricks and tiles; some invite the homeliness of whitewash, while others suggest the deep colouring of green or purple slate. Whatever it is, some definite colour-scheme should be adopted and colours of paint and any enrichments made to contribute to it.

Greatly as must the site influence the external treatment of the house, its internal arrangement will be even more definitely dictated by it. The position of each room in relation to the points of the compass and the outlook should be determined on the spot. It is now pretty generally realised that no sacrifice is too great which is necessary to enable us to bring plenty of sunshine into all the main living-rooms. The general rule would seem to be, to so contrive as to get the sunshine into a room at the time when it is likely to be most occupied. Let a study or breakfast-room be east or south-east, a general living-room or drawing-room south and south-west. A good western window in the room we most occupy in the latter part of the day gives us many an extra hour of daylight; while the opportunity it affords us of habitually seeing the bright colour of sunset is a privilege which is worth some effort to obtain. A kitchen is best north-east or east, for the first coming down into the fireless house may well have its cheerlessness reduced by what sunshine is to be had at an early hour; later in the day, when the kitchen is hot with cooking, the heat of the sun should not be added. A bathroom and bedrooms too are pleasant with an eastern

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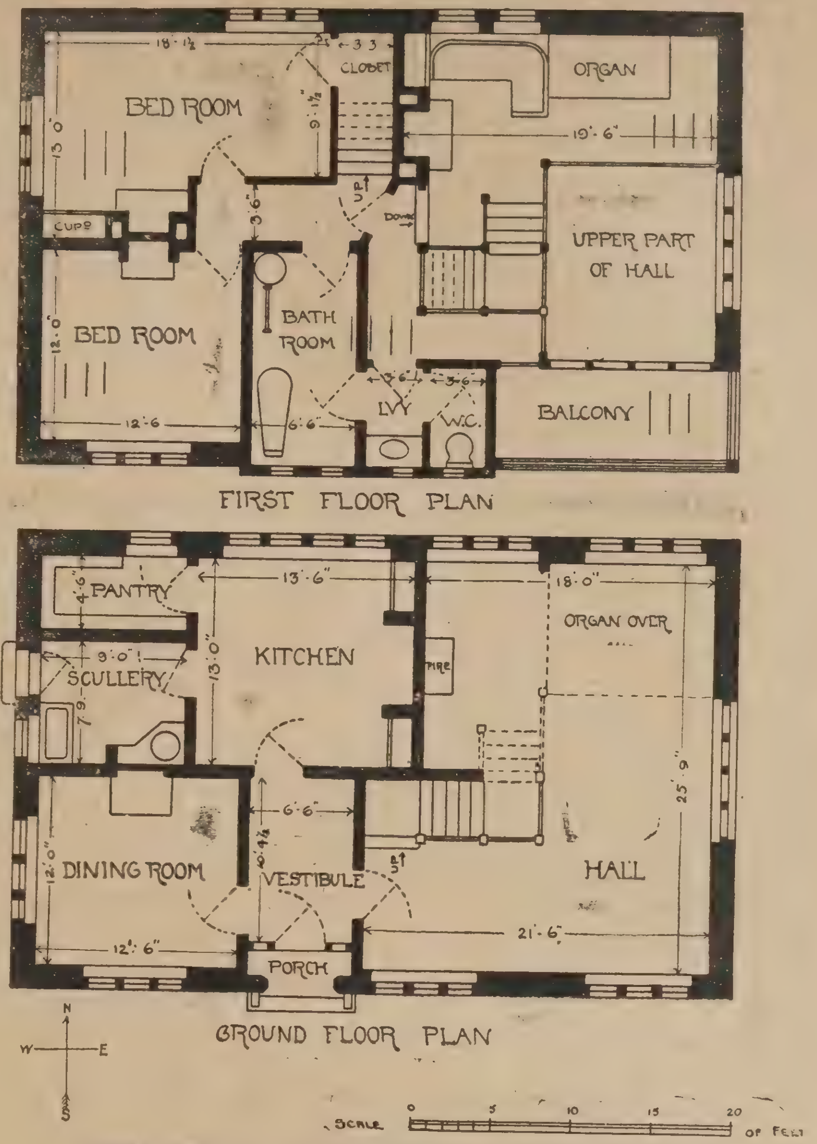
* A paper read before the Society of Architects on February 7th, 1901. [We are enabled to use the accompanying illustrations through the courtesy of the secretary, C. McArthur Butler, Esq.]



HOUSE WITH HALL AS CHIEF FEATURE. BARRY PARKER AND RAYMOND UNWIN, ARCHITECTS.

aspect, though some cannot sleep in a room into which early sunshine can penetrate.

Next only in importance to such considerations of aspect, and certainly important enough to modify them somewhat, is the question of prospect. For a pleasant outlook is a boon second only to a sunny aspect.

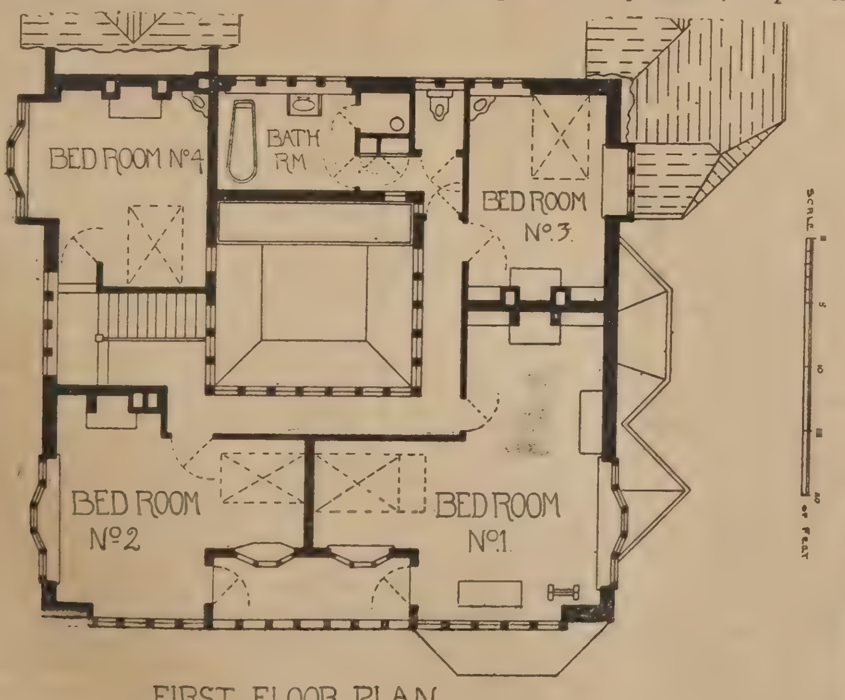
Before leaving the site one should be able to carry away not only detailed notes of drainage, water-supply, levels, fine trees, views and aspects, but also a general idea as to the best arrangement of the rooms of the new house, an ideal plan to be aimed at, and a sort of mental sketch in block of the general form the new creation should take externally.

It would be only tedious to you if I were to go through all the details of a house, trying to deal with them in a general way. I will therefore now take one or two definite examples and explain how and why we worked them out as we did, trusting that the interest which attaches to any active problem solved may come to my aid and redeem the details from tediousness.

We have chosen for the first example a country-house designed for a site in North Staffordshire, partly because the site was not one to very obviously suggest or very imperatively demand a special treatment. The plot of land consists of a small field, long and rather narrow; it is much the shape of a suburban building plot, though situated right in the country (see plan below and on the previous page.

The client required the house to have a good comfortable living-room for the general family life; another good room for entertaining guests and callers; a small den for his own use, with desk, safe, sample cupboards and gun-rack; four bedrooms, one to be a bed-sitting-room for an only son; a kitchen with the usual offices; outside there were to be wash-house, stables, coach-house, &c. The house was to be arranged to give as much open-air life within as possible.

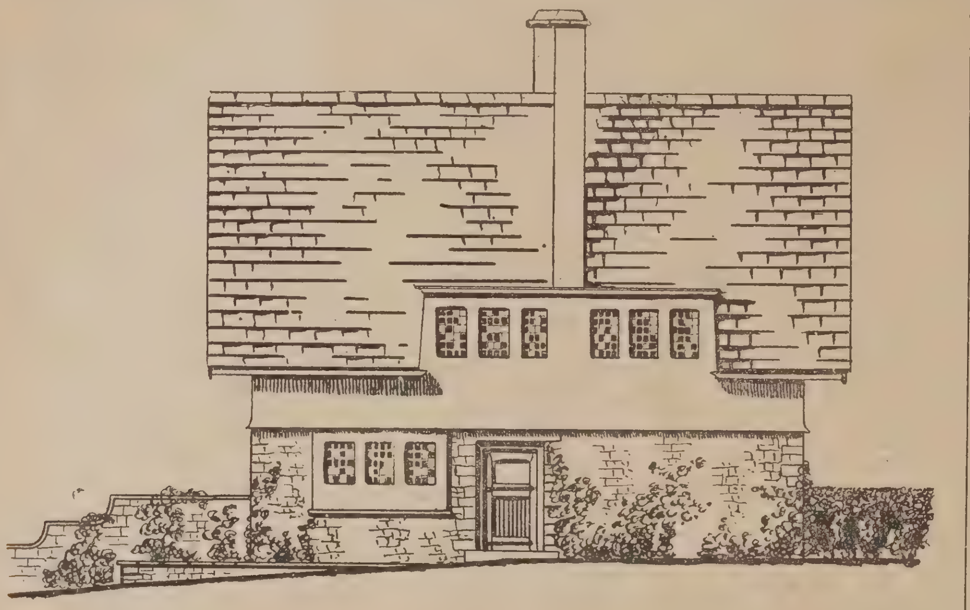
As the site is exposed to the prevailing winds, and the best prospect is in the direction whence they blow, some form of court on to which the rooms might open suggests iftsel as a means of obtaining the needful shelter. The stable yard not being very suitable for the purpose, the house is grouped round a very small central court, round which a corridor is planned fitted with sliding windows, so that it can be converted at will into a sort of small open-air cloister by sliding the sashes down below the sill. This is roofed over at as low a level as possible to avoid anything of the feeling of a well, which a court as small as this needs must be might soon produce. The main roof also is made to slope away from the court in all directions, so that a good deal of sunlight may find its way in. On to this corridor the main rooms open with wide double doors, and the court being protected against wind on all sides it is possible in any weather, except when extremely cold, to have the living-rooms open to the fresh air to a quite unusual extent. The kitchen, butler's pantry, front and side entrances, and stairs all communicate with the corridor, but so as not to destroy the privacy of the living rooms by obliging anyone to pass the doors when going from one to the other. Pleasing vistas are obtained from the rooms across the court, and from the corridor into the rooms, such as it is not often possible to contrive in so small a house. Provision is made in one corner for a ventilating stove to prevent excessive cold draughts in winter.



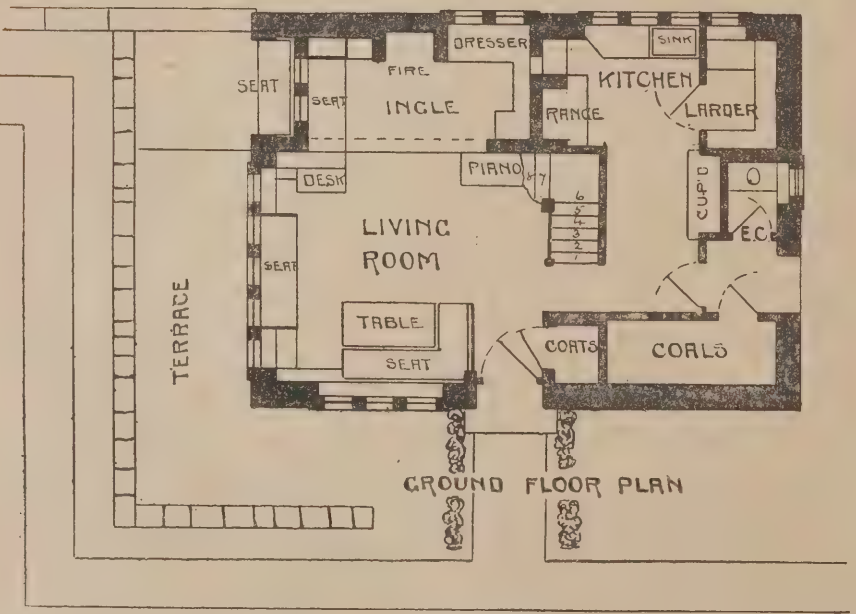
COUNTRY HOUSE IN NORTH STAFFORDSHIRE. BARRY PARKER AND RAYMOND UNWIN, ARCHITECTS.

The living-room, as the most generally occupied, and therefore most important room, is placed at the south corner, having the double outlook to south-east and south-west, and getting all available sunlight and the best of the prospect. It is not enough to give a room windows in the right direction, however: the room must be so arranged that it shall, so to speak, turn its right face, and the windows be so placed that they shall be naturally seen out of from the most usually occupied parts of the room. For this reason an angle window commanding the best part of the view is thrown out on the south-east side. The fire is put on the north-east wall, and, so that a thorough sense of cosiness may always be obtainable, it is placed in a deep recess or ingle.

Now an ingle affords a very good instance of how easy it is to misuse the old examples which we study, and that in two directions. For while some neglect altogether the suggestions which they offer, others copy the old forms without troubling to understand them. To make use of old features legitimately, of course one must first understand the reasons which called them into being: the difficulties which they were designed to meet; and when similar



SOUTH ELEVATION



COTTAGE IN DERBYSHIRE. BARRY PARKER AND RAYMOND UNWIN, ARCHITECTS.

reasons or difficulties present themselves to us we may then avail ourselves of the solution which they indicate, not copying slavishly the details, but taking the principle and working it out to suit our own particular circumstances. The ingle, of course, had two main uses: the first was to protect a wide open fire from the cross-draughts arising from badly fitting or open doors, shutters and windows; the second was to afford seats near the fire, sheltered from the draughts, where the aged and feeble could rest or anyone could keep warm in cold or rough weather. Incidentally, no doubt, our forefathers appreciated the value of contrast, the charm of the ruddy fire-light space glowing red in the grey ill-lighted building, and the cosiness of the sheltered low recess in the wide and lofty hall. To obtain this charm, as is often done, by forming an ingle so small that one cannot sit in it comfortably, is merely to remove the fire further from the room; while on the other hand, to arrange a large ingle, as is also sometimes done, with a modern tiled register stove set in a chimney breast is to lose the feeling of "sitting on the hearth" and the charm that springs from the fire being able to cast its glow all over the recess, and to be seen from every part where one can sit. To adapt the ingle to rooms of moderate size then and justify the space it occupies, it must be large enough to be comfortably sat in regularly: a place where one can live, not merely go to be roasted. The fire must be so designed as to have something of the feeling of the old fire on the hearth, and must not be cut off from the recess or in any way allowed to grow into a fireplace within a fireplace. It is generally well to make the whole recess into the hearth, and we often arrange for the fire to burn in a suitably-shaped firebrick hollow, which answers all purposes excellently. Fenders are best avoided, and anything like a loose coal-box is a disadvantage. A coal-box can generally be contrived in the thickness of the wall. The ingle must of course be protected from cross-draughts, otherwise the fire cannot be sufficiently exposed. When properly arranged and fitted with comfortable low seats, the ingle always proves to be a favourite part of the room: the place where people naturally go to sit and rest.

But I am digressing from the plan, and must return to the living-room which we are designing. There the ingle is of somewhat special construction, having several small windows to afford peeps out towards the court and the view, and to give light conveniently placed for anyone reading; and also having cupboards for the display of the client's collection of oriental pottery which is being utilised somewhat by way of decoration, where the changing lights falling on its bright colourings will give some additional variety to its beauty. The ingle is made deep enough for the seats to serve for sofas.

As meals will be taken in this living-room, a small dais for the purpose is provided in full view of the fire; and, by the client's wish, the recess for this is made a window recess in the form of a large sunny bay, having fixed seats on three sides of the table. This bay gives us another window facing directly to the best view as well as one to the west, which brings the evening light into the room, while the recess is a great advantage, as it prevents the room being blocked up with the meal table.

Near the door a slight recess is formed for a sideboard; and this end of the room is lighted by a window close by, which opens on to the balcony. A recessed balcony is, in our climate, much more useful than any projecting verandah. It is possible, owing to the extra shelter, to sit in such a balcony two or three times as often as in the verandah with open ends.

In this room all the important furniture forms part of the scheme: it is thought out and designed with the building. In the treatment of the room advantage is taken of the beams and lintels required for the recesses, and where these are lacking a deep picture-rail carrying line with them is adopted, under which the sideboard, cabinet and windows are arranged to finish, leaving an unbroken frieze above and giving a sense of order and unity to the whole. This frieze is decorated with a painted suggestion of landscape, but in simpler treatment if whitewashed, or tinted with the ceiling, would be light and satisfactory. The lower portion of the walls, under the decorated frieze, is finished in plaster tinted to the required shade by mixing colouring matter with the skimming coat.

Where economy is any consideration rooms may be kept as low as possible, giving additional space outwards, which is as valuable as space upwards, for an air reservoir, and for all other purposes so much more valuable. The house being described is 9ft. from floor to floor.

The hall or entertaining-room being intended for less constant as well as more formal use takes a somewhat simpler form. Placed at the west corner with windows south-west and north-west it gets all the sunshine during the afternoon and evening, when it is most occupied. It is placed so as to be immediately accessible from the entrance, and opens on to the balcony with folding doors and window. The fire is placed in an ingle contrived under the stairs and half landing, an arch being used in this case to carry the chimney stack and form the recess. The flue from the fire is brought over on to the arch by means of a copper hood. A little bay partly in the porch lights this ingle. The porch is also arranged under the stair landing, with a seat for a messenger under the stairs.

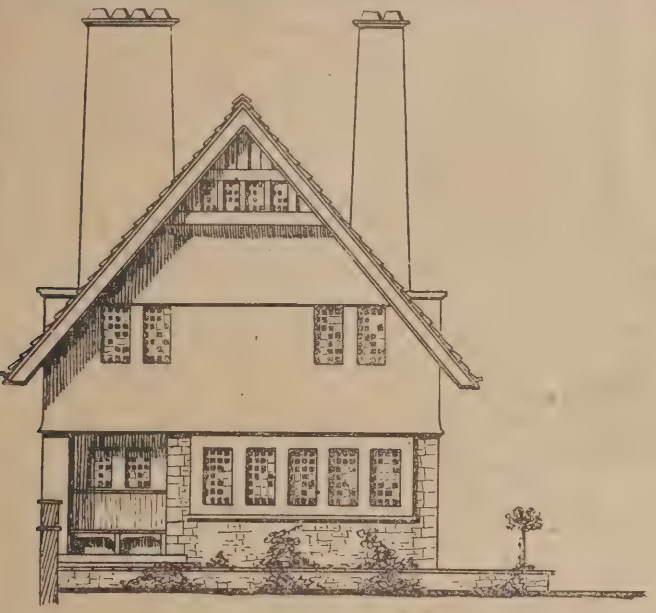
Adjacent to the entrance is the small sanctum. Here, again, something is taken off the square room, which, while improving it rather than otherwise by giving a recess for desk and pigeon holes, enables us to have a small vestibule with cupboard for visitors' hats and cloaks.

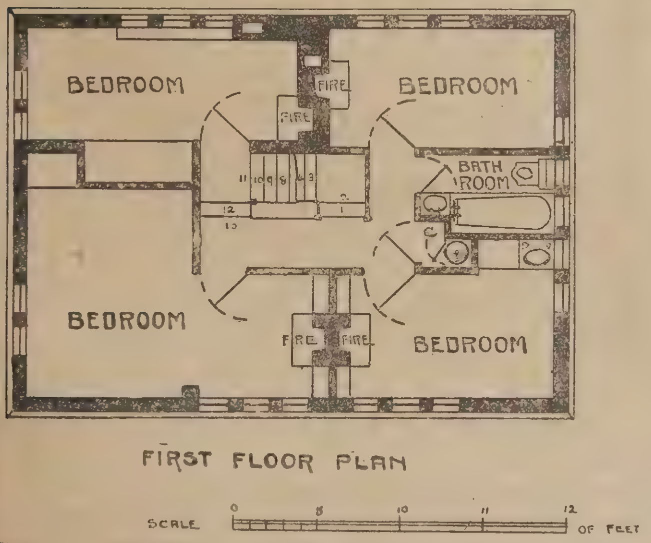
Handy to the entrance and to this room is the main coat-cupboard and the lavatory, from which a side door leads to the stable yard, while the butler's pantry completes this north-east side of the little court. Beyond this and behind the living-room, having its fireplace at the back of the living-room fireplace, is placed the kitchen. It occupies the east corner of the house and has its main window to the north-east, the right aspect for a kitchen. There is a small window to the south-east, to light the range and make it a comfortable place for sewing or reading. One corner between fire and window should always be kept free from doors in a kitchen, so that there may be a place to sit in, and it makes a more comfortable kitchen still where it is possible to collect the doors on one side only. Here an archway, closed by a heavy curtain when work is done, leads to the scullery, cellar, larder and back door.

The larder has its window in the back porch to get a north aspect, while thorough ventilation is secured by an opening on the south-east up under the eaves where the sun cannot reach it. The cellar was added after the preliminary plans were made, the scullery being re-arranged to receive it. This latter is made to obstruct as little as possible the squint window in the living-room ingle, and at the same time gets a south window, which, as there is no fireplace, is a good aspect for it.

The staircase rises from the corridor, and as it is accessible from all parts without passing the doors of the reception rooms, a back staircase is not needed. Where economy is a consideration the back staircase is one of the first things which may be dispensed with, for it adds little real comfort in proportion to its cost.

The bedroom plan follows pretty closely the ground plan, the bedrooms also leading off a corridor round the inner court. The balcony is repeated on the first floor, and, by reason of the parapet and overhanging eaves, it is even more sheltered than that on the ground floor, and makes it possible in two bedrooms to sleep practically in the open air in almost all weathers. It has special value, too, as an addition to the west room, which is designed for the boys' bedroom and study. Here the bed fits in a deep recess out of the way; a wash-stand is contrived in the sill of the window of the same recess, which is slightly bayed to give the needful room, and a curtain may be drawn across, cutting off all the special bedroom appliances, so leaving a good comfortable study.





COTTAGE IN DERBYSHIRE. BARRY PARKER AND RAYMOND UNWIN, ARCHITECTS.

The central court enables the corridor to have opening windows to three aspects, so that some can be opened whatever the direction of the wind; it also makes it possible to cut off the bathroom, housemaid's closet, and w.c. by means of a lobby having two little windows on to the court.

Of the treatment of the rooms little need be said. The recesses by the chimney breasts are fitted with cupboards and book shelves, which are designed to include simple framings or mantels for the fireplaces; the cornices are arranged to match the cornice over doors and windows and to carry line with a picture-rail running round the room. Wallpapers or other decorations stop at this rail, all above being taken in with the ceiling. This arrangement enables the ceiling to be broken up with the slopes of the low roofs without giving the ugly odds and ends of papered wall, which really are the only unpleasing feature about a ceiling broken up in that way.

During the whole of the planning the elevations are of course kept in view, and the block design carried away in the mind from the site constantly exerts a modifying influence. The difficulty usually is to maintain sufficient simplicity; so many features are suggested by little conveniences of planning that one has more often to cut them out, not to seek for them merely for the sake of effect.

This plan which we have just considered, representing, perhaps, rather a large house to be classed as "small," does not quite illustrate one point to which we attach very great importance in the designing of small houses. The two plans on page 57 show this—in which a special effort was made to obtain one room (the hall) giving some sense of space in a house not large enough to contain several large rooms. In every small house it should, we think, be a first consideration to secure one room large enough to afford some opportunity for interest being worked into the room itself, and to allow some comfort and dignity in the life of its occupants.

In the house shown the hall was made into the chief living-room and carried up two storeys to permit the introduction of an organ gallery. The gallery leading to the balcony, the landing, and the staircase are all thrown into this hall, the stairs being so arranged as to afford a screen to the fire, forming a sort of deep ingle with low ceiling under the landing. The low ceiling continues under the organ gallery and the balcony, the central part of the hall being open to the full height. The sense of cosiness in this ingle is greatly enhanced by contrast with the lofty open space outside, while the variety in lighting—whether when the morning sun streams in at the great east window, or when the ingle glows red in the gathering dusk—adds a perpetual charm. In the gallery is a second fire with a lounge seat by the organ under a kind of canopy formed by the half-landing of the second-floor stairs.

To obtain this spacious hall the remainder of the house has been reduced as much as possible. Only one other small room, for den or meal-room, is provided, with kitchens, offices and four bedrooms, two of which are on the second floor. It is open to question whether it would not have been a wiser use of the space to have thrown the vestibule also into the hall as was at first intended. Much dignity would have been added to the entrance thereby, while the way from the kitchens to the bedrooms would have been even less through the living parts of the hall than now.

Lest you should be inclined to think that only for people living a very exceptional life would it be advantageous to throw so much space into one room, I will next refer to a design made for a London literary man, who, though not able to afford a large house, still, by reason of his position, required occasionally to be able to entertain a good deal of society. Here the first consideration has been to obtain a hall which would be at once a comfortable living-room and a dignified entertaining room (see page 60). The meal-room has been kept as small as would just allow a little dinner party to be given in it. The fire is placed in one corner, the sideboard in another; had it been possible to put the door also in a corner it would have been still more convenient, for in a small dining-room it is in the corners that there is a little space to spare.

The narrow Hampstead building plot, having a southern aspect and the best prospect to the south-east, dictated the general arrangement of the house and the placing of the best room at the south-east corner. This room is spanned by two arches to carry the wall of the study over; within one of them is placed the fire recess with seats and fitment, thus using up all the space under the stairs to add to the size and character of the room, while the stairs themselves, which are shut off from the vestibule by a door, are also open to the room, the quarter-landing forming a small gallery overlooking it.

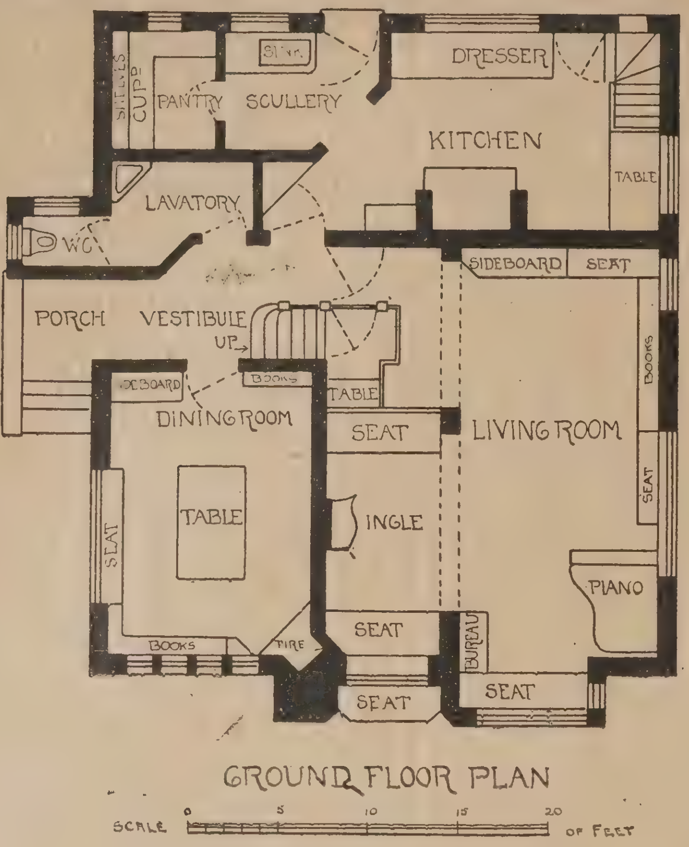
The staircase is such an essentially interesting and decorative feature in a house that it always seems a pity to shut it off in a mere passage, and the space under and around it may be made to add so much to a room both in size and individuality. In old houses the charm of such features is well recognised, for the favourite view, alike for the artist and the photographer, is that which contains some peep of stairs from the hall, some gallery, balcony, ingle or deep window recess. When the most is made of such advantages as can be claimed for the bare square room, they seem but a poor compensation for the loss of character and charm.

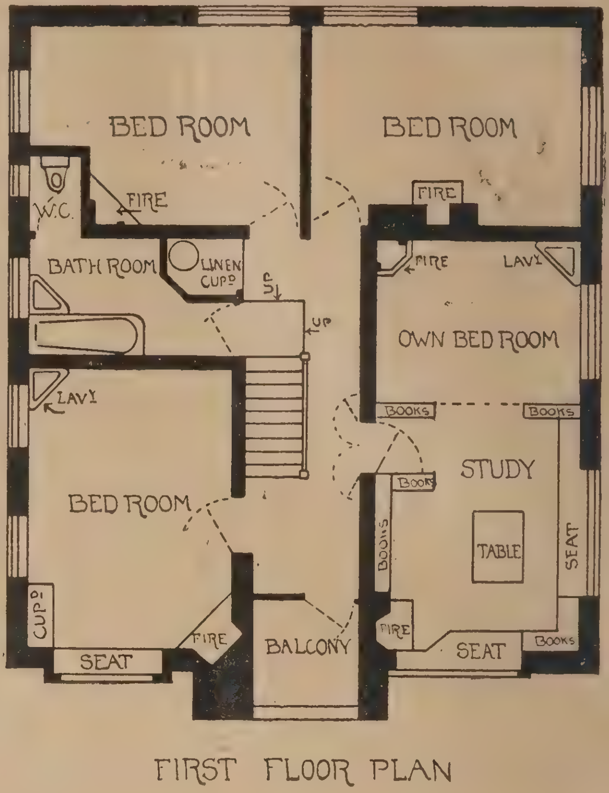
Over the hall in this house are placed the client's study and bedroom, the two being so combined that both may have the benefit of the whole air-space, book-cases and curtains screening off the bedroom portion. Double doors and double windows are fitted to this room, for perfect quiet both by day and by night is essential, and further to secure this, ventilation is obtained by means of two fireplaces and an air shaft built in one of the stacks.

But I must pass on now to cottages, the second part of our subject. I propose to regard as a cottage any house in which separate accommodation is not provided for servants.

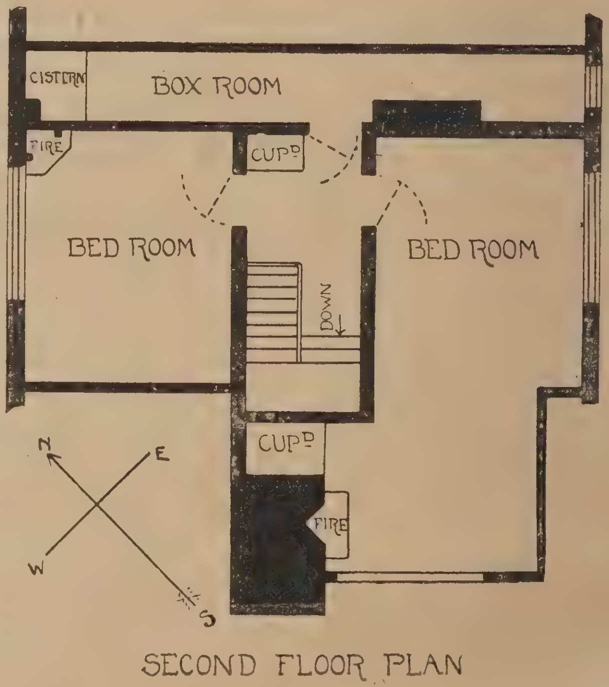
To cottages then all that has been said about the advantage of securing a good living-room, even at great sacrifice of other conveniences, applies with additional force. For not only is the total space at our command usually less, but the number of functions which the living-room has to provide for is greater, many of the functions of a kitchen being added to it. To combine the comfort of a living-room with the convenience for work of a kitchen will tax our skill in planning, and as the space we can give becomes less our care in the disposal of it must become greater.

Let us again proceed by way of example, taking a rather large cottage designed for a client who wished to live a quiet, simple life, yet on a scale that would allow of his enjoying the more necessary comforts and refinements (see this page and the previous one). The site





HOUSE AT HAMPSTEAD FOR A LITERARY MAN.
BARRY PARKER AND RAYMOND UNWIN, ARCHITECTS.



is near a small Derbyshire town, and consists of a mound caused by the outcrop of some shale grit. The site seemed to demand a simple oblong house with plain open roof kept as low as possible, forming a sort of ridge on the steep-sided mound.

The western end of the building naturally becomes the living-room, having plenty of window in the desired direction. There is a window to the north to command the best of the view—not a large one certainly, but one so placed that it is natural to look through it from many parts of the room. A window on the south side admits plenty of sun, and in addition on this side there is the outer door, placed there that it may be possible to enjoy the charm which a door opening direct from a room on to a sunny garden always gives. Such a door must, however, be so placed that while the peep out is obtained the comfort of the room is not destroyed. Here we have gathered the two doors and the stair foot together in a narrow part of the room out of the way, leaving all the rest of the space comfortably to occupy. The fire is placed on the north wall, in a deep recess.

To this one good room is added a kitchen for the more dirty work, fitted with a small range, a good cupboard for coats and hats by the entrance, a coal-place and larder. Upstairs are four bedrooms; one being rather narrow has a bed-recess taken off the larger room to help it, and as it is over the low ceiling of the ingle it gets the advantage of extra height under the sloping roof, and thus the low ceiling, which adds so much to the feeling of cosiness in an ingle, is made to help the bedroom over. Where some such arrangement as this is not possible, we sometimes utilise the space between the low ceiling and the floor above as a storage cupboard, and we often take advantage of it for ventilating purposes, by bringing fresh air into the room, slightly warmed by passing behind the fire, and delivering it over the opening to the recess, where it is distributed with the least possible draught. Where an outlet into a flue is desirable to supplement the exhaust due to the fire, we find this a very good place to arrange it In a room with close-fitting iron casements, sufficiently well built not to leak excessively through floors, skirting and door, the most frequent cause of a smoky chimney is the want of sufficient air-supply, and some form of inlet is an absolute necessity. In bedrooms we have successfully arranged this through a hollow fender kerb in some places.

All the bedrooms in this cottage are so arranged as to have a fairly comfortable corner between the fire and a window, where one can sit to read or write. An east aspect is obtained for the bathroom, and a linen cupboard warmed by the cylinder is provided.

Of the elevations I need only say that local random range stone is used for the ground storey, while for the upper portion the need for obtaining four bedrooms over a house so narrow required the use of 9in. brick walls, which are rough-cast in cement. To avoid the expense of dressed stone, and also to connect the two storeys a little, all the windows have brick jamb and mullions, and the rough-cast is carried down over them. The roof is covered with local stone slate.

Time will not permit me to refer in detail to any smaller cottage plans. But enough has, I hope, been said to make it quite clear that, whatever the size of the house, we think it should grow, both as a utilitarian plan and as an artistic creation, out of the real needs of the occupants; and that the art of designing small houses and cottages consists, not in following any accepted code of conventions, however useful these may be in their place, but in working out such a convenient and comely setting for the special life that shall be lived in them as shall enable that life to expand itself to the fullest extent, not merely unhampered by the building in which it is clothed, but actually stimulated by a congenial surrounding.

Workmen's Housing at Merthyr.—The Merthyr Urban District Council have the sanction of the Local Government Board to borrow £15,000 for the erection of 100 cottages at Penydarren.

Cripplegate Church.—A correspondent writing to the "Morning Post" in support of the proposition that the ancient Church of St. Giles should be opened up to view by leaving some land, now happily available, free from the hands of the builder, points out that the statement in the petition presented to the Court of Common Council that "the church was built as far back as 1090" is incorrect. The existing building was erected at the end of the fourteenth century. In 1545 it was greatly injured by fire, but happily it escaped destruction in the Great Fire. It has been altered and patched up at various times, the last restoration being in 1862, but it still preserves its old form.

ENGLISH ARCHITECTURE OF THE NINETEENTH CENTURY.*

By G. A. T. MIDDLETON, A.R.I.B.A,

IT is only with a considerable sense of the responsibility and the difficulty of my task that I have accepted the invitation of the Council of the Society of Architects to review the "English Architecture of the Nineteenth Century" immediately upon its close. Writing to-day, literally January 1st, in the first year of the twentieth century, it is almost impossible to divest one's self of all bias, and to approach without it the consideration of even one phase of the work of the most humanly complex century which the world has ever seen, especially when the phase in question is that which is the principal concrete reflection of the varying moods of man.

Looking dispassionately and broadly at the century which has recently been completed, it is seen to have opened for England in turmoil, poverty and privation, its people being borne up by a spirit of high patriotism. This period was followed by one of recuperation and then by rapid (at times too rapid) trade advancement, as the power of the steam engine was developed and our coalfields were opened up. Contemporaneously there came over the country a marvellous revival of religious feeling, both in the established and nonconformist churches. Towards the close of the century these fiercely-rapid movements settled down into steady commercial prosperity and generous religious tolerance, with less exuberance but more depth and solidity in both; and there has developed a still steadily advancing tendency to educate the people more and more highly, and to promote healthy municipal and family life, with comforts and elegancies within the reach of all, both in their own homes and in public institutions.

There have, of course, been other influences at work, and occasionally national events, such as the Crimean War, have caused at least a temporary diversion of the trend, but upon the whole these appear to be the lines upon which a general advancement has taken place. They are, too, the lines which are most prominently reflected by the architecture, and for the most part, it must be borne in mind, unconsciously upon the part of the architects who were individually concerned.

Speaking now of the country's architecture, it will be noted that the eighteenth century had seen the gradual decadence of a true English Renaissance style, and the substitution of formality and precise rule for the originality introduced by Wren and maintained by his immediate successors—alike in important buildings and in the comfortable square-brick dwellings of the middle classes. All design was based upon the Roman orders, which had been reduced to a system of precise proportions, on no account to be departed from, and this had become so entirely a fixed principle that even the discovery of the much more beautiful Classic work of Greece, with its varying proportions, had hardly shaken it.

At the commencement of the nineteenth century, consequently, all English architects were by training and education Classic purists, and were divided into two schools—Roman and Grecian—the many followers of Sir William Chambers forming the first, and Inwood leading the second, that is if during the first twenty years of the century England can be said to have possessed any architecture at all, for no buildings of first-rate and very few of even second-rate importance were attempted. Inwood, however, with his exact Grecian copyism, as in the Church of St. Pancras, was destined to be followed by others who, like himself, studied Grecian architecture in Greece, and who, on their return home, erected dignified and well-proportioned buildings in the Grecian spirit—not many, but now and again one, preserving in this country for more than half the century an appreciation of the simple, the beautiful and the refined, which might well otherwise have been lost. Such buildings were the British Museum, by Sir Robert Smirke; the Liverpool Athenæum, by Thomas Harrison; the Hanover Chapel in Regent Street, by C. R. Cockerell; and St. George's Hall at Liverpool, by H. L. Elmes—this last being one of the really great buildings of the century, perfect in its proportions and in the delicacy of its details, magnificent in its scale and perfectly satisfying to the most cultured taste.

But if the Grecian school retained for England an appreciation of the choice and pure, the Roman school, capable of wider and more varied interpretation, was eventually to have the greater influence, merging as it insensibly did into a revival of pure Italian Renaissance. In this form it was responsible for the Travellers' and the Reform Clubs, by Sir Charles Barry; the Carlton Club, by Sir Robert Smirke; the Museum of Practical Geology and the west end of Somerset House, by Sir James Pennethorne; and St. Thomas's Hospital, by Henry Currey—all works of great importance and worthy of any architectural period in any country. These it will be noted are all metropolitan buildings, and except in London and a few of the larger provincial cities scarcely any examples of the style of any value are to be found. About thirty years ago, indeed, it had to fight for its very existence in the now almost forgotten but then extremely virulent "Battle of the Styles," and its exponents, then mostly old men, were apparently vanquished by the more enthusiastic and younger votaries of Gothic work.

The Gothic Revival had commenced much earlier, and at that time seemed likely to become a permanent English style. Yet, like a hot-house plant, it withered with extreme rapidity after displaying a few flowers of great beauty; and it exists no longer. Originating out of the attention drawn to our churches by the "Oxford Movement," and from the necessity of repairing and enlarging the churches and cathedrals in architectural harmony with their original design, an immense impetus to the general employment of Gothic forms was given by their adoption in the Houses of Parliament by Sir Charles Barry, who had invaluable assistance from Pugin in the preparation of the designs. This truly magnificent building, a veritable "Wonder of the World," owes its greatness to other qualities much more than to that of style—to its marvellous grouping, its absolute suitability and great originality. Its style, in fact, is mixed, the general lines of the river front being essentially those of a Renaissance building; and even the Gothic detail is not above reproach if examined separately and considered as Gothic detail only, and not, as it should be, as the suitable and harmonious enrichment of one of the grandest buildings which the world possesses.

The influence was first felt by directing the attention of the students of the day to the possibilities of Gothic architecture, and attained fruition when these students reached their practising manhood. Butterfield, Sir Gilbert Scott, Paley, Street, Burges, E. M. Barry, Pearson, Sir Arthur Blomfield and Bodley are a few of the names most closely connected with the Gothic Revival; but Pugin had preceded them all, and is now generally regarded as the "father" of the style. The "cross" in the courtyard of Charing Cross railway station may, though small, be taken as a typical example of his work, and in this regard well bears comparison with the larger but somewhat similar Albert Memorial by Sir Gilbert Scott.

It is, however, somewhat invidious to single out any one of Sir Gilbert's Gothic works for mention more than the others, for if Pugin was the "father" of the revival, Scott was certainly its most prominent exponent, there being scarcely an English cathedral which he did not touch by way of restoration or some small addition, and hardly an ecclesiastical edifice in the country about which he was not in some way or other consulted. Of his original churches, the best known is St. Mary Abbott's, at Kensington, but merely from the accident of its being in the metropolis; for many are as rich and as perfectly proportioned, and, it may be added, as mechanically exact in detail.

Irrespective of restorations, the other great ecclesiastical works of the period may be reduced to four; and though there are a really large number which are eminently satisfactory, these four stand out unrivalled, while each is very different from all the others. Christ Church, Westminster Bridge Road, the work of Alfred Bickerdike, who died recently in obscurity, is an example of perfect grouping and graceful detail, worthy of the best mediæval period; Cork Cathedral is instinct with the spirit of original conception and overflowing artistic inspiration of William Burges; Truro Cathedral is the refined result of careful study of English architecture of the thirteenth century, by J. L. Pearson; and Trinity Church, Chelsea, exhibits the strong individuality of J. D. Sedding, tempered by much sketching both at home and abroad.

The public buildings erected during and in accordance with the Gothic Revival were scarcely so numerous, and show by their general unsuitability that the style was a forced revival and not a true growth. Thus it is that, in spite of their great beauty, the word "unsuitable" has been used as sufficient to condemn alike the Manchester Town Hall, by Alfred Waterhouse, and the Law Courts, by G. E. Street—though in the public mind the great architectural merits of this latter work have been greatly obscured by its acknowledged defects in plan, while among English architects the fact that it follows French rather than English tradition has frequently led to its being only half understood. Both, however, are great buildings, and speak eloquently of an endeavour amongst the more cultured of our race to express their desire to have things graceful and beautiful around them. More generally acknowledged as a successful Gothic public building is St. Pancras Station, by Sir Gilbert Scott, with its somewhat formal lines well concealed by clever grouping and the use of graceful towers, and its special adaptability to modern requirements. So far as it is formal and suitable to a modern many-storeyed building, it has been followed in many a smaller building since, but in its higher attributes it stands alone. For private houses the "Revival" has proved a failure, as it did for street architecture also, a notable exception being Mr. Astor's offices on the Thames Embankment, designed by Mr. Pearson.

The Natural History Museum was erected by Alfred Waterhouse, about twenty years ago, in what seemed then to be the full height of the Gothic Revival; and yet marked its coming sudden termination by the evident attempt, in a building of the first importance, to evolve something fresh. In spite of the deserved popularity of its author, the first of the great Gothic revivalists to willingly break away from the employment of Gothic forms alone, and almost the only one of those great men still living amongst us, this, his greatest work, has hardly received the recognition from his contemporaries which it deserves, and which will undoubtedly be bestowed upon it by posterity. Not many English buildings display so perfectly the quality of thoughtfulness based upon ample consideration of what is best in many other countries besides our own, combined with extremely careful colouring.

With the death of Sir Gilbert Scott in 1879, followed by the decease of Street and Burges in 1881, came the end of the energetic phase of the Gothic Revival. During the whole strenuous period it had unconsciously been but preparing the ground for something else, while the Classic and Renaissance traditions which it had apparently overwhelmed had in reality been but slumbering, and now awoke with the contemporaneous erection of the Bolton Town Hall, by W. Hill; the Glasgow Municipal Offices, by William Young; and the Brompton Oratory, by Herbert Gribble. The first of these was, at its opening, commented upon by the "Times" as "an edifice which, for architectural beauty and internal arrangement and decoration, is probably unrivalled by any building in the country which is devoted to municipal purposes"—an opinion which at any rate received endorsement in the erection of replicas at Leeds and Portsmouth. Of the Oratory it need only be said that it is incomparably the finest Renaissance church erected in England since the days of Wren.

The next architectural phase was a curious one—a rage for the quaint, induced by an over-study of the buildings in the low countries and the district of the Loire, in the hope of developing a picturesque style of small dwelling, and contemporaneous with the "æsthetic" craze in art generally. It would occupy too much time to-night to consider any except works of some magnitude, else a good deal might be said of the highly satisfactory domestic architecture of the last twenty years under the leadership of Norman Shaw and Ernest George. But the influence of this domestic style was felt in larger buildings, the picturesque grouping and tiny detail suiting well the comparatively small Law Courts at Birmingham, by Aston Webb; the recently-erected Municipal Buildings at Oxford, by H. T. Hare; and the English Opera House (now the Palace Theatre), by T. E. Collcutt; while it went far to detract from the nobility of the Imperial Institute.

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* A paper read before the Society of Architects on February 21st, 1901.

This tendency to littleness of detail was checked by the common-sense solidity of Norman Shaw's New Scotland Yard, still in a distinctly Belgian style (its evident prototype being the Mont de Piété at Liège), and by the reversion to a strong Italian Renaissance in the Accountants' Institute, by John Belcher. This last is the most notable building completed during the last decade in England or elsewhere, its fine proportions, its strength and its bold originality, combined with the free use of the highest class of sculpture, raising it far above contemporary works. Its influence, too, appears likely to be considerable, if one may judge from the published designs for buildings which are not yet erected.

Looking back over the century as a whole, one cannot help being struck both by the immense variety of first-rate building which has been done in England, and more by the steadily increasing amount of good work which each decade has seen. During the early decades a few great buildings arose in London, but generally speaking architecture was a lost art; now there are educated practitioners in every part of the country, who are producing artistically satisfactory work largely in accordance with a prevailing fashion or style, while buildings of importance, hospitals, schools, town halls, &c., are rising everywhere. The past has shown progress, and the prospect for the future is good.

A GREAT HOUSING SCHEME.

BY far the largest housing scheme undertaken by any municipality is now proposed by the Housing Committee of the London County Council. An area of 225 acres of land has been secured at Lordship Lane, Tottenham, outside the county boundary, and it is proposed to erect there sufficient semi-detached cottages (with gardens) to accommodate 40,000 persons. The land upon which the new cottages are to be built lies high, and is well situated so far as communication is concerned. On the northern part of the estate there will be four classes of cottages. The fourth class will consist of dwellings which will hold 3,360 persons in 336 flats, built two in each house. The third-class cottages will number 1,900, for 11,400 persons; the second 1,950, for 11,988 persons; and the first 346, for 2,976 persons. The southern portion of the estate will accommodate 7,460 persons in 1,029 cottages. The cost of the scheme will be about £1,500,000. A portion of the land in the centre will not be built over, but will be left for a recreation ground, with public hall and offices, for the new scheme means the erection of practically a new and self-contained town. Shops, also, will be built on the estate, and will be an important source of revenue. Of the land to be taken, 177 acres are ready for building, and the work can be put in hand at once. The other portion requires a certain amount of clearing. Even with the restrictions now placed upon the Council by the Local Government Board as to the repayment of the whole outlay and interest within sixty years, it is anticipated that the work can be carried out without imposing any burden on the ratepayers, at the same time erecting dwellings which can be let at rents which, it is expected, will range from 6s. to 9s. 6d. a week.

Besides this scheme, the Council has two others on a similar plan in hand for the benefit of South London—one at Norbury, which will accommodate 5,800 persons, and one at Tooting for 8,500. Already 12,000 people live in County Council dwellings. By the time that the Norbury, Tooting and Tottenham schemes have been carried out there will be nearly 100,000 persons so housed.

Builders' Notes.

Mr. Edward Benson, decorator, of Darlington Street, Wigan, died recently.

Messrs. Young and Marten, Limited, of Caledonian Works, Stratford, have just issued a new list of trade discounts allowed on the prices in their well-known and comprehensive catalogue.

Mr. John Rothwell died recently at the age of 74. Deceased was senior partner of the firm of Messrs. Rothwell and Sons, builders, St. Helens. He leaves a widow, two sons, who carry on the business, and two daughters.

Messrs. Greaves, Bull and Lakin, blue lias lime and Portland, selenitic, Roman, &c., cement manufacturers, of Warwick, are converting their business into a limited liability company, under the title of "Greaves, Bull and Lakin, Limited." This change is made simply for family convenience, and the entire ownership, control, and management will remain in the present hands. The head office has been removed from Warwick to their Harbury Works where the postal address will be "Harbury, Leamington." The branch offices in London and Birmingham will remain as at present.

Mr. Benjamin Holland, a well known Dudley builder, died recently at the age of 62 years. The business of builder and contractor which the deceased gentleman had for many years carried on with his surviving brother, Mr. William Holland, was commenced by his grandfather, Mr. John Holland, in High Street, Dudley, in 1790. After the death of this gentleman the business was carried on by his son John in Wolverhampton Street, Dudley. Afterwards the business was continued by Mr. William Holland, father of the deceased gentleman, and eventually the deceased's brother, William, and himself in partnership, under the firm of "William Holland and Sons." Church work figured largely in their contracts. Amongst others may be mentioned: the restoration of St. Mary's, Kingswinford; St. Edmund's, St. Thomas's, St. James's, and St. John's, Dudley; Christ Church, West Bromwich; Cradley (Four Ways); Gornal Church; and Enville Church, which occupied five years. Schools and other buildings also formed a large part, including Wolverhampton Street Board Schools, alterations to Kate's Hill Church schools, Dudley Baths, &c.

The Nottingham Master Builders' Association held its annual dinner last week. Mr. H. Vickers presided, with Mr. F. H. Fish as vice-chairman. Mr. Price proposed "The Mayor and Corporation of Nottingham," coupling the toast with the names of the Sheriff, Dr. J. Brown Sim and Councillor J. Wright, who responded. "Success to the Nottingham Builders' Association" was proposed by Mr. J. W. Woodsend and acknowledged by Mr. F. H. Fish. Mr. James Wright gave the "National Federation and Kindred Associations." He urged the association to continue connection with the National Federation, the Midland Branch of which was an attempt to unite and weld into one body all the master builders' associations of the Midland counties. Their relationship with the architects was fairly, though not wholly, satisfactory, neither with regard to Nottingham or any other towns he had visited. The National Federation had had in hand for many years, with the Royal Institute of British Architects, the drawing up and forming of a national and recognised form of contract which, when it was complete, would be satisfactory to all parties. During the past year this had been under discussion by the Midland Federation, and a form of estimate had also been under consideration. Mr. A. Chambers and Mr. J. B. Alliott responded.

The Clerk of Works Association.—The 18th annual dinner of this Association was held last week at the Holborn Restaurant. Mr. W. E. Riley, F.R.I.B.A., the superintendent architect of the London County Council, presided. Mr. Spencer Green, vice-president, in proposing the toast of "The Architects and Surveyors," said he was glad to be able to say that one effect of the formation of an association was that the salaries of clerks of works had considerably increased of late years. Mr. Thomas Blashill, F.R.I.B.A., who replied for the architects, said that all practising architects knew how to value the meritorious service of the clerks of works. It would be impossible to carry out works of the magnitude with which they now had to deal unless the clerks of works were of the greatest efficiency. The materials now being used in connection with fireproof construction called for their special attention. Before long he hoped that it would be a rarity to see buildings of any importance whatever that were not properly constructed, and that would not absolutely resist a fire. With the good assistance of the engineers in scientific matters they would be able to effect a great improvement in that which was a very important branch of their business. Mr. Chatfield Clarke, F.R.I.B.A., replied on behalf of the surveyors. Mr. Spooner gave the toast of "The Carpenters' Company," and said that that guild had done everything in its power to raise the status of their association. Professor T. Roger Smith, F.R.I.B.A., master of the Carpenters' Company, responded. The chairman, in giving the toast of the evening, "The Clerk of Works Association," said they had made great strides since the time when Sir Christopher Wren was his own clerk of works in connection with the erection of St. Paul's Cathedral. The duties of the members of the association were much more onerous than many people realised, but the architects knew how much they were indebted to them. When he was in his pupilage if he wanted any information about sound and practical building he was always sent to the clerk of the works, from whom he invariably received an intelligent answer. The President, Mr. Plowman, in replying, said that the association now had 150 members. They were progressing from year to year, and they hoped before long to secure the co-operation of the Royal Institute of British Architects and the Institute of Civil Engineers in raising their status. Many members of the association were in favour of incorporation, and he hoped it would soon come about.

Correspondence.

Old Lancashire Churches.

To the Editor of THE BUILDERS' JOURNAL

MANCHESTER.

SIR,—"Southport" will find Baines' "Lancashire" of use in connection with old Lancashire churches. Ormrod's "Cheshire" and Dugdale's "Derbyshire" may also be of service for these two counties.

Yours truly,

W. K. BOOTH.

Lightning Conductors.

To the Editor of THE BUILDERS' JOURNAL.

LONDON.

SIR,—Referring to Mr. Hands' very interesting letter on page 25 of your issue for February 13th, with a further criticism of my article on lightning conductors, it is true lightning does not exactly "wander aimlessly about," but it certainly has the peculiarity of being so erratic in its course as to leave an unpleasant element of chance as to how the electric—force, shall I say (I must not call it "fluid")—will distribute itself.

In general Mr. Hands disagrees with me in what I said about leaving these matters to so-called experts. Can he say whether an expert advised the builders of the great cathedral spires of Salisbury, Lichfield, Chichester (prior to the restoration in 1861) and others? These have safely weathered many a storm.

Yours truly,

CHARLES E. SAVERY.

R. I. B. A.

PRESIDENT'S ADDRESS TO STUDENTS.

A MEETING of the Royal Institute of British Architects was held last Monday evening. Mr. William Emerson, president, was in the chair. The minutes of the previous meeting having been confirmed, Mr. Emerson's address to students was read by the Secretary, Mr. W. J. Locke; the following is a summary of it:—

In the few words I have to address to the younger members of the profession I will endeavour to lead you to some higher planes of thought in relation to the practice of the art of architecture, rather than to mere practical business elements material to success. I presume, of course, that those of you who have taken the trouble to pass our examinations have in your minds the idea of actually practising in the profession. I will therefore consider some few of the things involved in this word practice, the objects, aims and points in connection therewith, that should be weighed by one undertaking such responsibilities. There is a right use or proper employment of architecture. I need hardly point out that building is the most necessary of all sciences: in its objects it subserves the highest and the lowliest wants of humanity. It is a science, but the love of beauty inherent in our natures makes us demand that it be more—that it be an art as well—and this side of it is architecture, and, if good, unites with it all arts.

I pointed out last year how a thorough education, not only in architecture itself, but on a wide and comprehensive basis, is essential; and this education should not only be gained by study of man's work in the arts and sciences, but also by study of God's work in nature. There should be besides an inquisitive, diligent searching into the reasons of things. Architecture should be more than mere building in the best material and manner; the thought and needs of the time must be expressed. It does not suffice to satisfy the one only who has conceived it, but it should be capable of pleasing all people in all times. It is the divine element in man materialised in his works: his two natures, the human and the spiritual, are evidenced in his individual conceptions. In real architecture there must be not merely the individual bias or personality exhibited by one's particular devices, peculiarities, or the excellences of one's draughtsmanship, but there must be the expression in all sincerity of spiritual sentiment also. The artist's material personality or mechanical dexterity should not be predominant so much as the spiritual or divine influence inspiring him. If such be our aim, we shall rightly use any powers of architectural design with which we may be endowed, and be enabled to express the highest mind that is in us by the forms of which draughtsmanship will convey the conventional rendering. This habit of mind, combined with constant practice, care and accuracy, will lead to dexterity of expression of feeling which is essential. But more than habit of mind for fitting expression in our art is necessary for successful practice. There should be habit of method in study, and attention to apparently trifling details, and in business conduct. There is nothing so prejudicial to artistic effort as worry. Therefore the architect whose soul is in his art should strive by methodical habits and rules of business to render himself as impervious as possible to worry.

The importance in practice of study with thoroughness in both the theoretical and practical sides cannot be too strongly urged. If it be true that in trade a highly trained intellect is so essential, in how much greater degree must it be so for the profession of architecture! For beyond the mere business element, without which, to a certain extent, it is impossible for the architect to practise successfully, there is the necessity for a thorough knowledge of art, with much of many other subjects, such as science, history, &c., combined with the study necessary for the acquirement of that dexterity without which he cannot express his ideas. A serious reflection for the young student in this country is how very much his education must depend upon himself and his own exertions if his work is to be more than that of an amateur and have vital force, and if he wishes to succeed by his power and competency rather than by smartness and push, or playing off upon the public the eccentricities or fashions of the moment. The days of mere building by architects in this country are, we hope, fast passing away; and this century the public will demand, not only that the architect be versed in all practical details of his calling, but that, by really cultivated taste and intellect, he may build with power, beauty and perfect utilitarianism.

But by those who wish to excel as artists time must be allowed for the study of nature. Deductions and inspirations innumerable may thus be gathered, with a freshness no study at second hand from man's work can give.

Higher education is absolutely necessary if the status of the architect is to be raised. It should be remembered that doctors and barristers are almost always University men; and it will be well to bear in mind that the sooner it becomes the rule, rather than the exception, for architects to receive a higher, or perhaps a University education, the sooner will the acknowledged status of the profession be elevated.

Then for facility of practice the architect should cultivate his memory; and as all cannot perform feats of memory, a practice of writing down useful information should form another habit. The architect in designing not only requires to remember details of old and other work as a guide, incentive, or restraint to his own, but he must recollect endless details of construction. But above all he must remember the effect certain proportions, details and compositions have given, in isolation or when in juxtaposition in former examples, ancient or modern. An educated perceptive faculty and a good memory are necessary to realise the full teaching of past times.

There is also in connection with the practice of the art of architecture such a word as proportion; and its value and meaning may easily be lost sight of. To the architect's mind may probably immediately be suggested the comparative relation of one architectural detail to another and to the whole composition. But besides the objective symmetry and harmonic degree of form or size, proportion may be considered by the architect in other ways. Of course, proportion in this sense is the very first essential of fine architecture. It should be an inherent faculty in the architect and artist, but it may be cultivated. And proportion must descend also to the smallest details. Proportion in colour is also a most important factor in the excellence of artistic work. The study of nature is the guide as to how much of any one colour will harmonise with another.

There is also a proportion in architectural work which requires to be maintained between coarseness and refinement. This is a very subtle point in all good work. Too much refinement in architectural work tends to weakness of effect and deprives it of its masculinity. At the other extreme, "muscular" architecture, as it has been termed, may degenerate into coarseness. It is the carefully balanced proportion between these that avoids either extreme. The effect of all the finest architecture has been attained by a combination of strength and power with refinement of well-proportioned and beautiful detail. Too much care cannot be bestowed on the proportion that sculptured and other decorations bear, first to the whole composition, and secondly to each other. In all this the architect's should be the guiding spirit, however much may be done by the craftsman or sculptor.

Then there is the proportion that the worship of one's art should bear to one's life. The larger the environment the greater the sphere of usefulness in life.

Success in the practice of an architect, as in other callings, should be aided by a proportionate feeling sympathetic with a life full of effort and enthusiasm. Nevertheless, success in the art of architecture should be the settled purpose of him who proposes to practise, and that to the fullest extent, "in proportion to his being a human being, living his life amongst his fellow-creatures, to whom he can impart or derive something. The aim of culture is to make us better company as men and women in the world." There is also a proportion that should be observed between the ideal and the sentimental. The one is the spiritual in our art, the other the simply sensuous.

Æstheticism, an American writer says, is not "the vital force inherent in the idealist; much of what in our architectural art of to-day seems to satisfy the casual and thoughtless is devoid of the life and spirit of art. It is the idealist who will, with a strong faith in the spirit that is in him and with energy of purpose, strike out for himself fresh achievements. He may fail, but he is ready to take the risk, and has the courage of his opinions. To the æsthete a lower plane of work altogether, a pretty tone of colour or eccentric form, a delicate curve or a sentimental line of poetry, devoid of the spiritual essence of the ideal but pleasing to the fancy, will afford infinite satisfaction" So there should be proper proportion maintained between artistic sentiment and practical purpose. The man who sacrifices the purpose to the art is not a useful member of the community; while he who sacrifices his art altogether to utility does not elevate the community. It is the correct judgment weighing the proportionate values of the one and the other which makes the architect.

Then there is the necessity for a proper proportion being maintained between work and rest. There is such a thing as staleness. The want of recreation makes a man dull, unfit for companionship or sympathetic mingling with or interest in his fellows; and his work suffers in consequence. Also there must be margin for reflection and thought. Great achievements usually germinate in quiet moments.

Then of much importance in connection with the practice of the architect, as in all other businesses in life, there is another thing that must be borne in mind, and that is right principle. This in architecture will mean an avoidance of shams and false construction, which somehow always manage to look wrong, even though worked on such a grand scale as the external walls of St. Paul's, or the impudent ugliness of our shops with stone façades, apparently standing on nothing. Truth makes work look consistent and correct; lack of it offends good taste. Palatial decorations in offices, ecclesiastical embellishments in restaurants, the affectation of cottage simplicity in a palace, or *vice versâ*, imply a want of appreciation of the fitness of things, and are wrong in principle; and this element of truthful principle in architectural art should be carried down to the smallest detail if the work is to live.

Then there should be right principle in your motive of action; and this is a most important point if you desire not only your personal position to be respected by others but also wish to uphold the dignity and status of your profession generally. Professional respect must ever depend on the character, conduct and aims of the units in the profession. The architect should, on principle, enrich his mind and render himself proficient in all branches of his work, as his duty to his clients, and should deal fairly and avoid harshness in dealing with those over whom he is set as a supervisor. You cannot interest yourselves too much in the work of this Institute, whose objects are to encourage the art of architecture, to uphold the interests of the profession, and improve its status. This obligation will be best served by a large-minded way of looking at all sides of thought, and by cultivating broadness of views in our art of architecture, and not by the pushing forward of any particular school or clique. In combination we are strong; separated we are comparatively weak.

Mr. J. Alfred Gotch then gave a criticism of the designs and drawings submitted for the prizes and studentships, 1900-1. Mr. Gotch impressed upon his hearers the importance of the competition for essays, for taking architects as a whole he was sorry to say they were extremely wanting in facility of expressing themselves. The essays should contain only matters pertinent to the subject and have life and be readable.

The prizes were then presented to the winners in the competitions.

Bricks and Mortar.

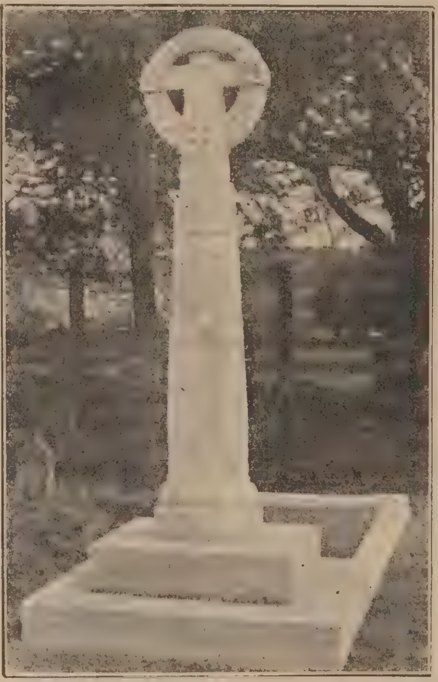
APHORISM FOR THE WEEK.

Fame is the nurse of the Arts.—CICERO.

Our Plates. THE house at Long Ditton for Mrs. Styles is now in course of erection. Mr. A. J. Hardwick, of Kingston-on-Thames, is the architect. The red brick plinth continues around the whole building at the ground-floor sill level, all the upper part (including the chimney stacks, which are built battering) being covered with white rough-cast. The roof will be covered with deep-red Broseley tiles and the external woodwork painted white, with the exception of the porch, which will be left rough from the saw and stained down to a rich brown. The builders are Messrs. M. Kelsey and Sons, Chessington, Surrey. Mr. Hardwick is also the architect of the proposed house on the Thames Ditton Park Estate. This design is intended to be carried out in white rough-cast, the roof covered with Leatherhead tiles, the eaves gutters supported on wrought-iron brackets, and all the external woodwork painted black. A feature is made of the hall, which it is proposed to pave with stone slabs. The constructional woodwork in the ceiling would be left showing and rough from the saw, with rough-cast panels between the joists. The walls will be panelled and the whole of the woodwork stained down to a dark colour. Mr. E. S. Prior's drawing of new medical schools at Cambridge was exhibited at last year's Academy.

Further Discoveries in the Forum. IN the course of the excavations now proceeding between the Arch of Tiberius (see page 44 of last week's issue) and the Basilica Julia, in the Forum, an important fragment of the Forma Urbis, or marble map of Rome, has been discovered. The fragment was found in a sewer, of which it had formed part of the covering. On it are engraved in Roman letters the words ERMAE PAE, which are thus reconstructed (TH)ERMAE (AGRIP)PAE, or baths of Agrippa. The fragment also bears an inscribed plan of a great part of the baths of Agrippa, including the whole of the Pantheon. This is the most important fragment that has been brought to light since the discovery of that which bore the plan of the Porticus Liviae in 1869. In view of the importance of the frescoes discovered in the Palatine Basilica, better known as Santa Maria Antiqua, a commission of experts was appointed to study the best means of preserving the frescoes from destruction. After much discussion the commission has adopted the proposals of Signor Boni, director of the excavations, who is authorised to roof in the Basilica so as to preserve the paintings from the weather; to complete the winding pathway of Imperial construction which led from the Forum to the Palatine Hill; to arrange in the best way possible the flooring of those parts of the Basilica where the ancient pavement has been removed; to disinfect the surface of the frescoes which have been impregnated with deleterious matter during their long burial; and to suggest some means for preserving the paintings from the effects of fog, damp and excess of light. Several of the experts were at first in favour of detaching the frescoes from the walls and placing them in a museum, but after examining the Basilica with care they have decided that it would be far better to leave them where they are.

Mr. Alfred Gilbert on Sculpture. LAST week at Burlington House Mr. Alfred Gilbert, R.A., the newly-elected Professor of Sculpture at the Royal Academy, delivered the first of a series of six lectures on the sculptors of the fourteenth, fifteenth and sixteenth centuries, taking as types Donatello, Michael Angelo and Benvenuto Cellini. His first address was in the main introductory and in a measure historical. For Donatello, Michael Angelo and Cellini he found prototypes in Greece in Praxiteles, Phidias and Zeuxis; though he did not imagine that the Italian artists had any knowledge of their Greek forerunners. Mr. Gilbert drew several comparisons between the two sets of artists, and likened the nature of Donatello, the harbinger of the Renaissance, to that of Praxiteles. Both, as far as he could judge, were men of earnest kindly disposition. Sculpture, which was the most conservative of the arts, exacted more from its followers than either painting or architecture. It demanded more sacrifices because fewer people understood it, and because of another great stumbling block—the question of remuneration. "Sculpture," declared Mr. Gilbert, "is not, and never will be, remunerative." In his next address, among other things, he will explain the process used by the great men mentioned in place of enamelling and the methods of sculpture practised by Michael Angelo. People were under the impression that England had no artists at the time these men were working in Italy. That was quite a mistake, for there were two great English sculptors at the time Torrigiano was carving the tomb of Henry the Seventh. They were not recognised because they were called "effigy-makers." But at Warwick there was a monument executed by one of them, William Austin, in memory of Beauchamp, Earl of Warwick, which was of stupendous excellence, and could, perhaps, vie with any Italian example.



MEMORIAL CROSS, HUNSTANTON CHURCHYARD. H. WILSON, DESIGNER AND SCULPTOR.

Asiatic Art. AT the last meeting of the Society for the Encouragement of the Fine Arts, Mr. Joseph Offord, M.S.B.A., delivered a lecture on "Some New Relics of Ancient Art from Western Asia," lantern slide illustrations being shown of a number of antiquities lately discovered. Commencing with some extremely archaic Babylonian bronzes and reliefs, an Akkadian cylinder of great antiquity was exhibited, having most interesting affinities with the early first or second dynasty Egyptian art workmanship from Hieraconopolis. An exterior restoration of the Palace of Sargon was shown and a description given from the latest researches of the architectural features of Assyrian buildings; also a picture of a striking relief executed in enamelled brick, showing a Gryphon of exquisite design, which was found in the palace at Susa. A series of copies of the bronze reliefs from Balawat proved the perfection attained by the workers in metal as early as the time of Shalmaneser the Third. Two new Hittite monuments of much interest—one a cylinder in the Boston Museum of Fine Arts, and the other a relief of a deity—were followed by a bas-relief from Arslan Tepe in Asia Minor, now in the Museum at Constantinople, which shows a procession of warriors and charioteers of every Assyrian type of art, but probably the product of Vanuic or Aramaic workmanship. Of similar territorial origin was the celebrated Nerab Stele with an Aramaic inscription of as high antiquity as the "Moabite Stone." Among other photographs exhibited was the sarcophagus of Tabnith, King of Sidon, also the splendid tomb of later date, but from the same site, known as the sarcophagus of Alexander, one of the most perfectly preserved monuments of Greek art.

Planning and Design of Churches. AT a meeting of the Leeds and Yorkshire Architectural Society held last week a paper was read by Mr. H. C. Corlette on the "Planning and Design of Churches." In the first place, he pointed out with some emphasis the necessity of the building being made to belong to and to harmonise with its surroundings, and he proceeded to advise architects not to put too much egotism into their compositions. Let the personal element be found rather in their work than in an ostentation, amounting to vulgar display, which forced its recognition upon the notice of all who looked at the building. Proceeding, he offered some advice with regard to the selection of sites and the adaptation of the buildings to their surroundings; and he went on to deal with the technical features of plans, such as those relating to the construction of the sanctuary, the choir, the nave, the side-chapel and the vestries. The lecture was rendered the more interesting and instructive by means of a number of plans and coloured drawings which were exhibited.

Mr. Tweed's Memorial. MR JOHN TWEED, of Chelsea, has nearly completed the last of the four panels which are to constitute the memorial which Mr. Cecil Rhodes proposes to erect in South Africa to the men of Major Wilson's patrol who were slain at the Shangani River just seven years ago. All the figures, both of horses and men, are life-size, those on the fourth and final panel being Captain Judd and Lt. Hofmeyr (on horseback), and Messrs. Vogel (a son of the late Sir Julius), Hellett, Meiklejohn, Welby, Watson and Abbot. The panels, which are cast in bronze, will be all fixed to the sides of a huge monolith close to the famous Zimbabye ruins, and the only inscription will be: "To Brave Men," these being the words originally carved upon a tree near the spot where the bodies of these heroes were discovered.

Electric Advertising Signs. ON page 46 of our issue for last week we gave a report of the case of *Hull* v. *the London County Council*, concerning electric advertising signs. The Electric Sign Company, Limited, now wish to point out that the case covered a very much wider ground than the signs in question, "and, as a matter of fact, the decision of Justices Bruce and Phillimore has defeated the London County Council in an attempt to obtain control, under a section of the London Building Act relating to the 'construction of buildings,' of any and every erection or object affixed to the face of a building and extending beyond the general line of such building. Had this attempt been successful, except in a very few cases where the building happens to be set back from the general building line, every letter, signboard, or other object exhibited on the face of every place of business in London would have been at the mercy of the London County Council."

Memorial Cross, Hunstanton Churchyard. THE cross illustrated on this page was erected under the superintendence of Mr. Herbert Ibberson, F.R.I.B.A., to the memory of the late Francis Hewitt, of Leicester and Hunstanton. It is of unpolished Irish limestone and in one block above the base. The designer and sculptor was Mr. H. Wilson, of 17 Vicarage Gate, Kensington. Our illustration is from a photograph by Miss G. Hewitt.

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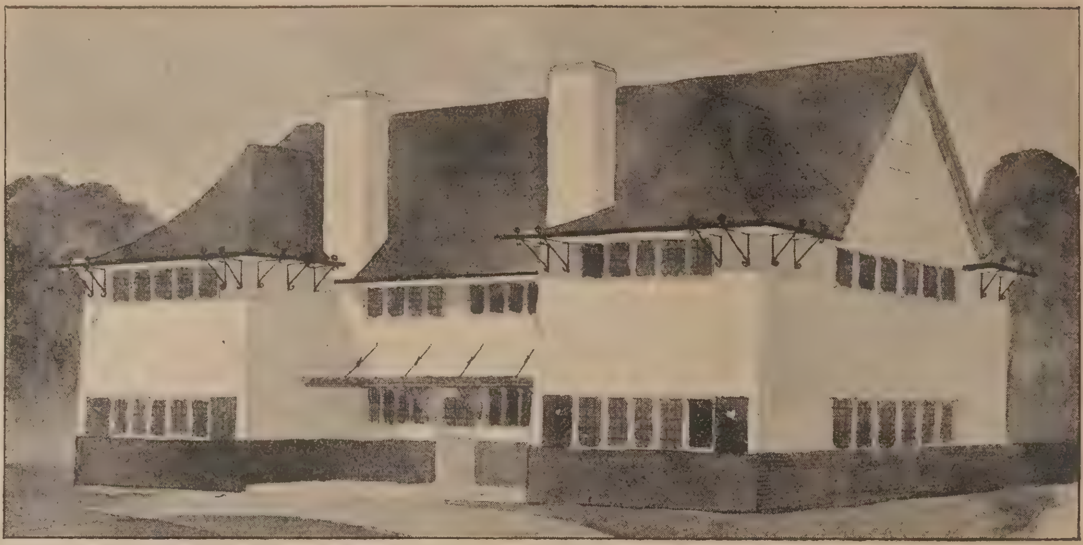
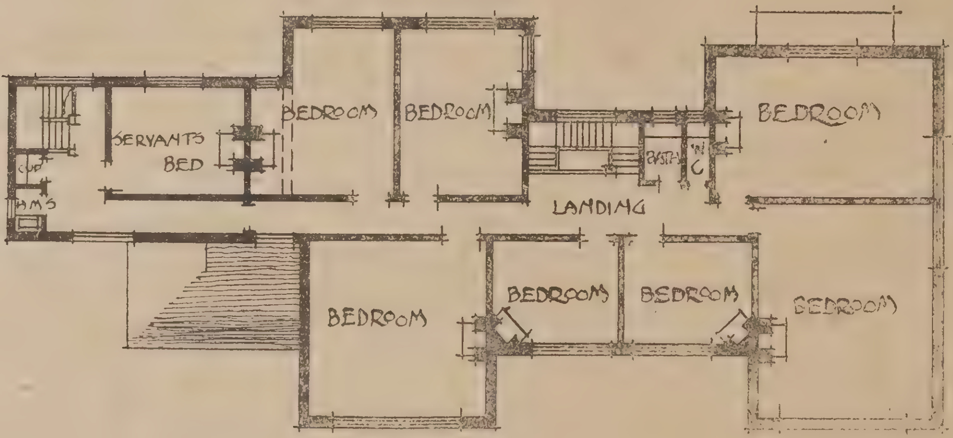
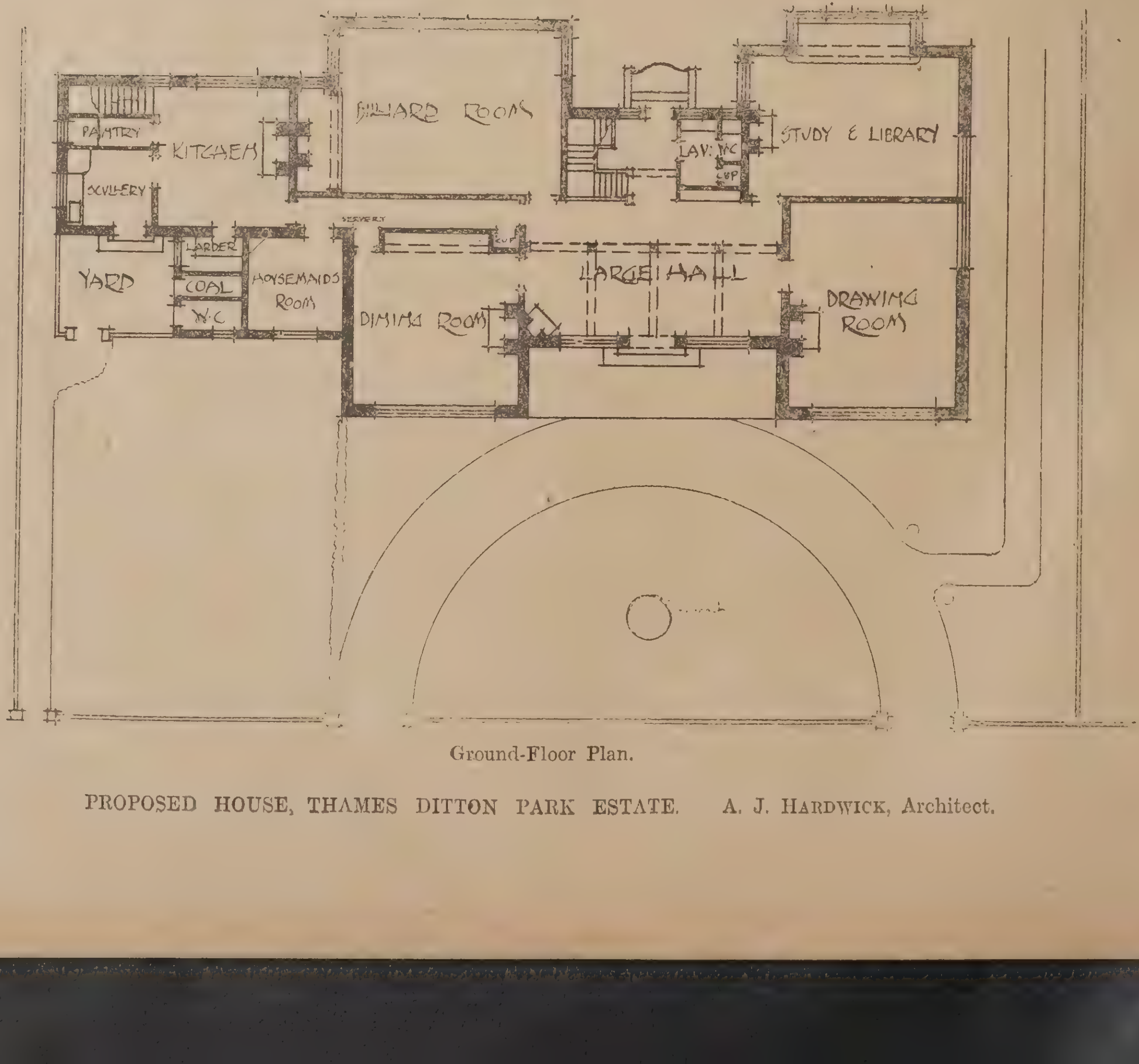




First-Floor Plan.



Ground-Floor Plan.

PROPOSED HOUSE, THAMES DITTON PARK ESTATE. A. J. Hardwick, Architect.

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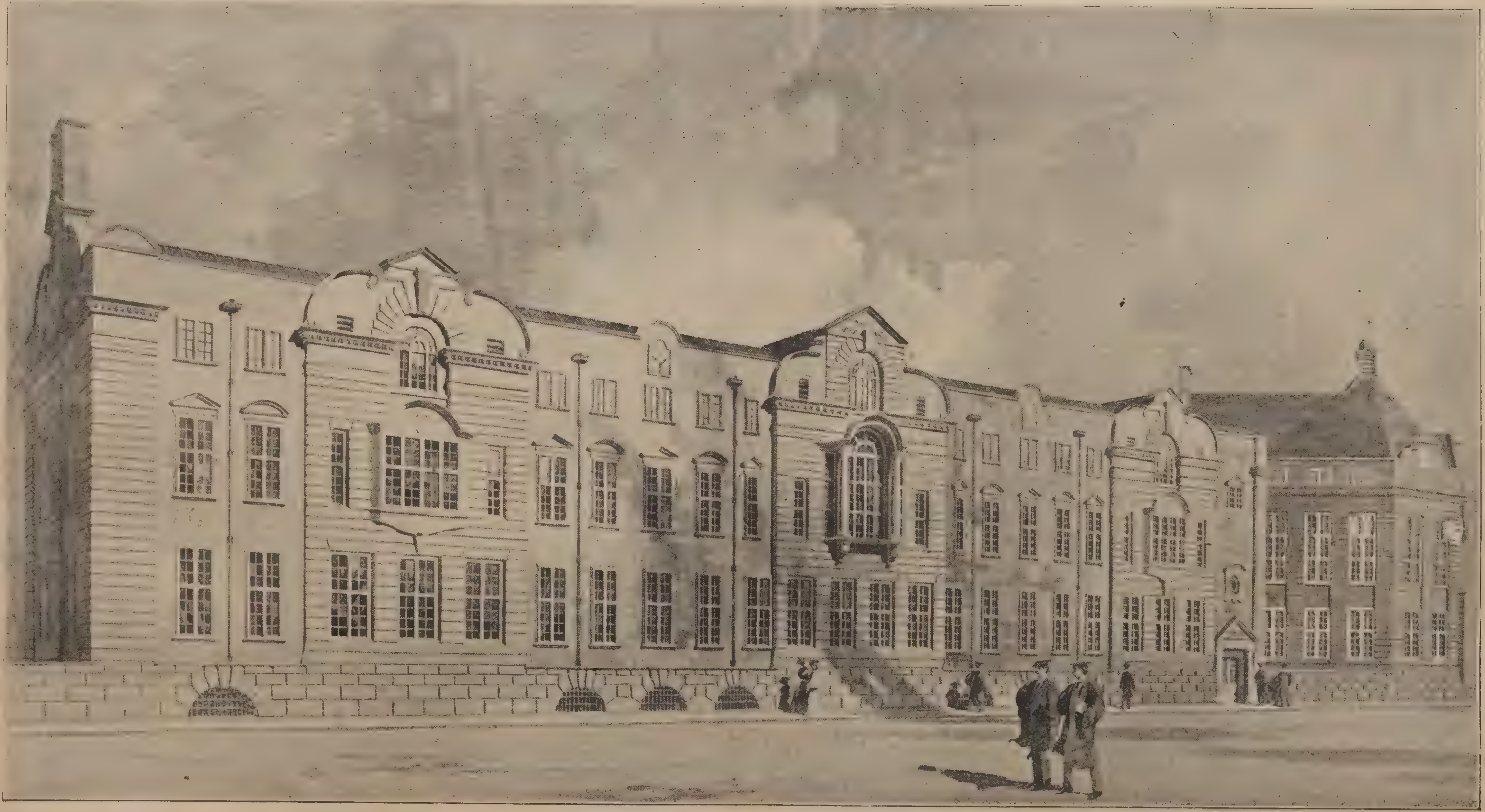

THE MEDICAL SCHOOLS, CAMBRIDGE. EDWARD S. PRIOR, Architect.

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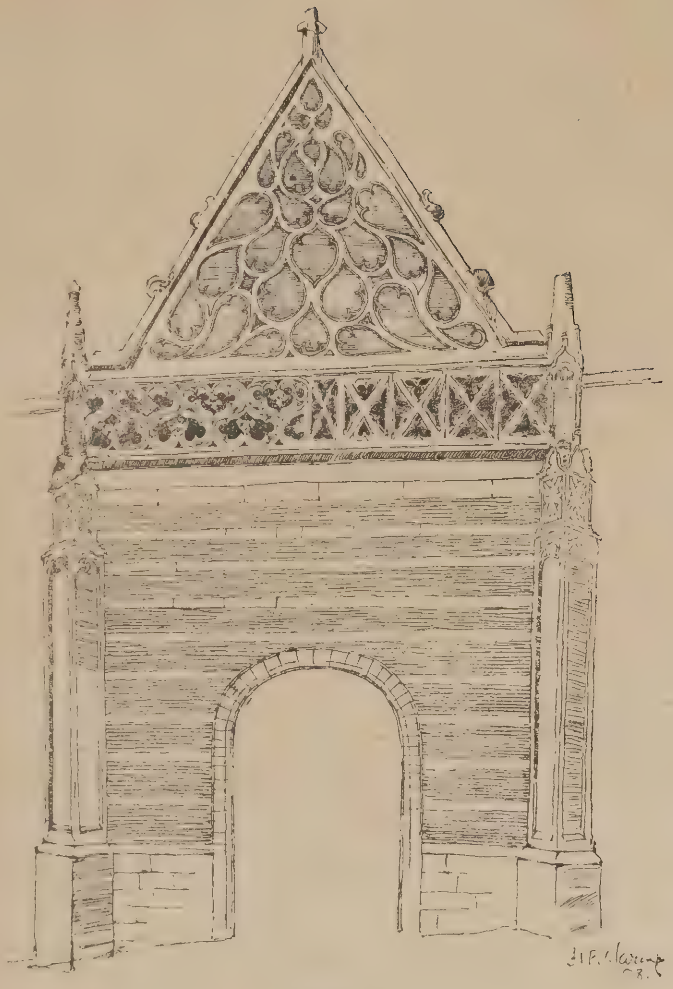
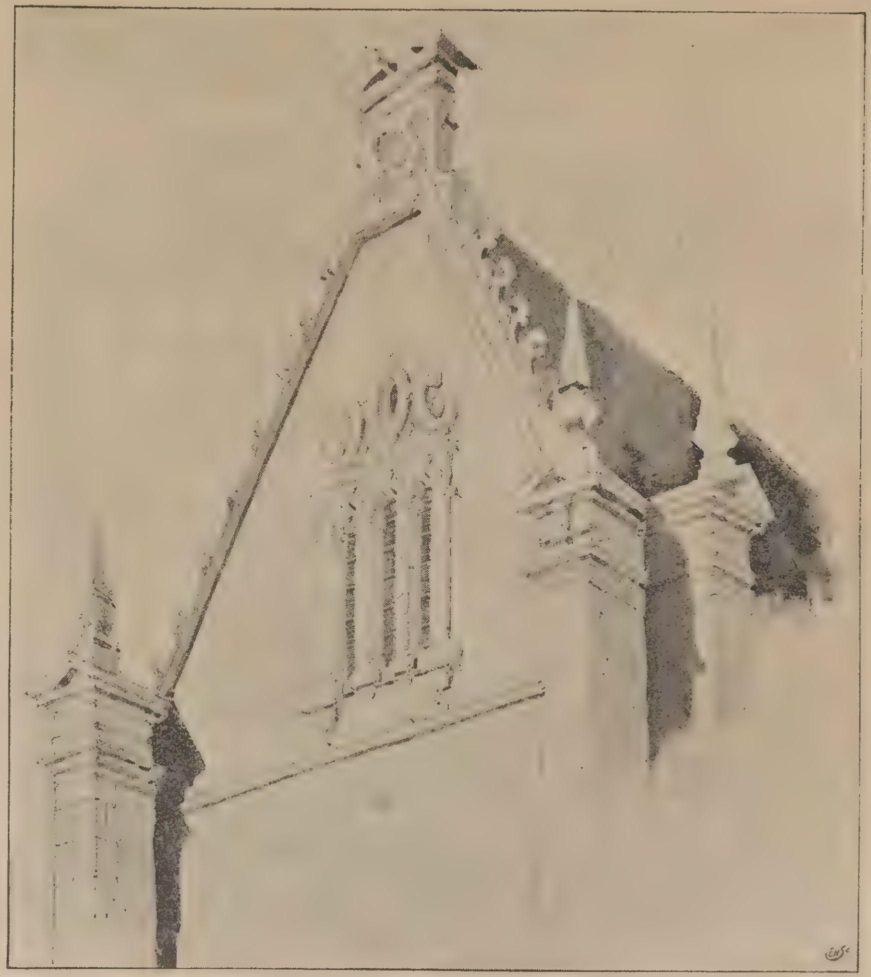


Porch.



Gable.

THE GROOTE KERKE, HAARLEM. Drawn by H. F. Waring.

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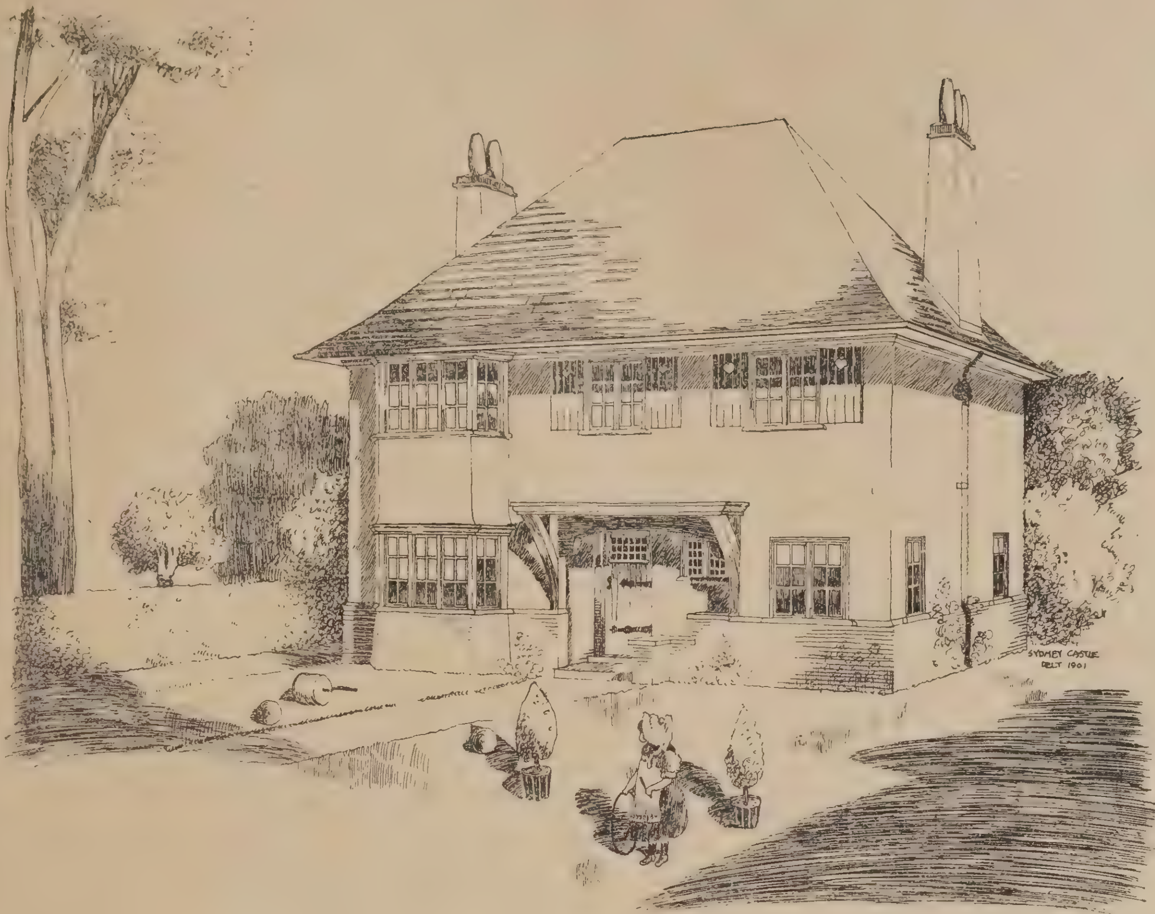
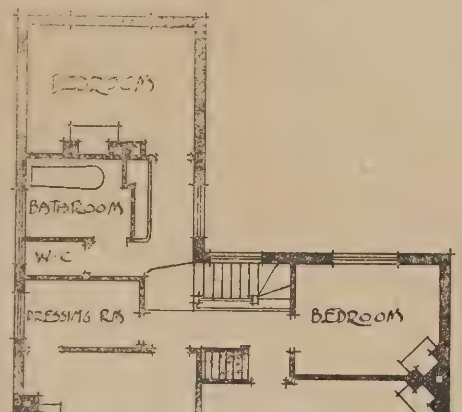
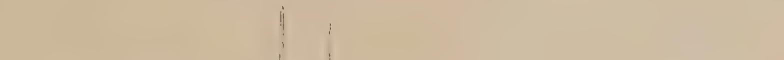




First-Floor Plan.



Ground-Floor Plan.

HOUSE, THORKHILL ROAD, LONG DITTON. A. J. HARDWICK, Architect.

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THE PLANNING OF INEBRIATE REFORMATORIES.—III.

By GEORGE H. BIBBY.

(*Concluded from page* 29, No. CCCXIV.)

IN a previous article I directed attention to the isolation rooms required for violent or disorderly patients as shown in the plan issued by the Home Office. These apartments are planned to be very small, and I have ascertained that there is (possibly as a result of the putting forward of this plan) an impression in certain quarters that a very small cell would be sufficient; this is quite a mistake, but the plan now given indicates a room 13ft. by 7ft. by 9ft. in height, which would afford sufficient space.

I have heard it suggested that the isolation room, or cell, need not be more than 6ft. by 6ft. for inebriates; but it should be remembered that while an English prisoner has a cell with a capacity of 819 cubic ft., a vagrant or tramp confined in a workhouse cell is frequently only allowed a cubic space of 360ft.; the size of his cell being about 9ft. by 4ft. by 10ft., with an area of 36ft. These figures show that the minimum accommodation for vagrants in workhouses compares very unfavourably with that provided in modern English prisons, and that the latter also contain cells which have one-third more area than the lunatic asylum allowance for rooms for single patients. Surely inebriate patients should have not *less* cubic space and floor area than is allowed for ordinary convicts!

The isolation rooms for inebriates may or may not be fitted with a water-closet; but in the first case the cubic space should be 819ft., while, if there be no closet, a cubic space of 600ft. would be sufficient. It will be observed that under all circumstances the prison authorities are more liberal in their allowance of space than the Local Government Board.

Should it be deemed desirable that the isolation rooms should not contain water-closets, these should, instead, be provided near the passage or corridor leading to the isolated rooms, and in or near this corridor may be placed a lavatory with hot and cold water services; but it may be preferred that basins and water be supplied to the inebriate patients in their cells.

In Fig. 1 is shown a plan for isolation cells and corridor; in this instance the water-closets are placed in the rooms. It will be observed that for the purpose of deadening sound the division walls are of a substantial thickness, but other means for securing this object and also the safe custody of the inebriates may be adopted.

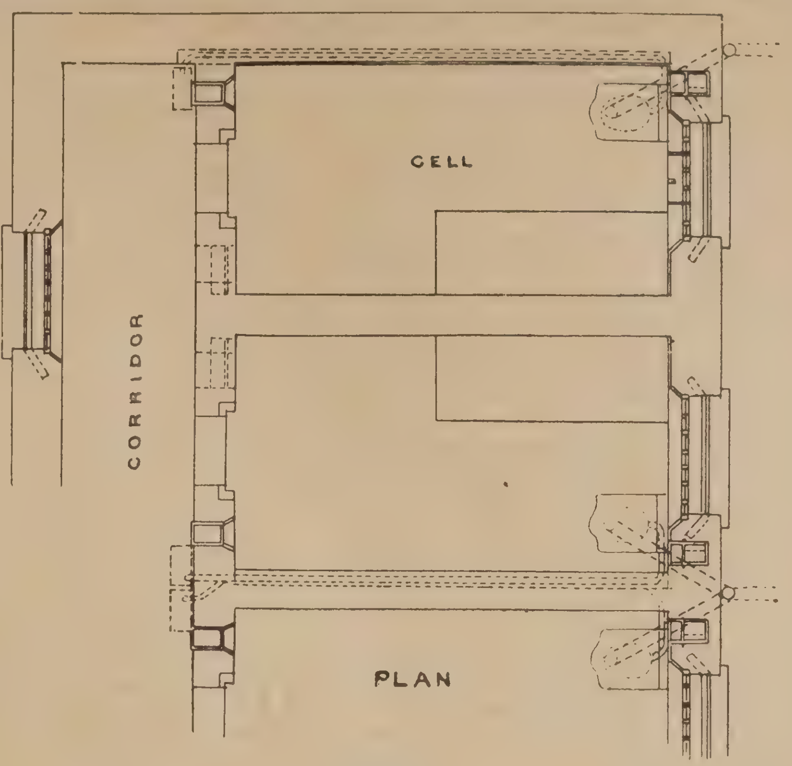


FIG. 1.

In Fig. 2 is given a transverse section through an isolation cell in which the water-closets are omitted, and a seat or bed fixed under the window with heating pipes below, as shown also in Fig 3, which gives a section through the corridor, where a lavatory basin is fixed. From these diagrams it will be perceived that the heating and ventilation is effectually arranged for. Warm air may be admitted into the isolation cells from the corridor, in which circulating hot-water pipes may be laid in a channel under the floor, with inlets to the cells near the ceiling and also 12in. from the floor; or the apartment may be warmed by heating-pipes laid in the cells just above the floor, enclosed by a casing to form a chamber in which the air, brought directly from outside the building, is put in contact with the hot-water pipes and then admitted into the cell through gratings. In each of these arrangements fresh air from the outside should be admitted in sufficient quantity to supply the cells, the inlets being equal to 54in. for each cell. The area of the clear openings in the gratings should be equal to that of the inlets, and care should be observed that the gratings are arranged to prevent them from being made means of communication. The inlet openings for fresh and warmed air into the cells should have as few bends as possible; they should be provided with means of regulation by the inebriate inmate, but not be capable of being quite closed. Foul air should be extracted from the cells by means of flues, having a superficial opening area of not less than 54in. per room. These flues should be led to the outer air in as direct a course and with as few bends as possible, but may pass into a main horizontal trunk and vertical shaft, which should be equal in area to all the flues led into it. The shaft should not be less in height than two-thirds of the horizontal distance from it of the most distant apartment ventilated into it, and it is desirable that means should be provided to rarify the air in the shaft to assist extraction, or some form of induced-current ventilator at the outlet should be provided; the openings into the extraction flues should be as far as possible from the inlets for warmed air into the cells.

Artificial light should be provided for the isolation cells, accessible only from the corridor. Each apartment should be provided with a fixed wooden bench, about 30in. wide, to serve as a seat or bed, and there should be a bell or gong communicator to enable the inebriate patient to call attention when necessary. The doors and frames should be very strong (perhaps even lined with sheet-iron), and have glazed inspection holes, with a cover on the corridor side, such as is used for police cells, and a strong flush lock to open from the outside only. The doors may be hung to open outwards, in which case two barrel-bolts must be fixed in addition to the lock, to give sufficient security. It will be seen from the above that the arrangement of an isolation room or cell for an inebriate patient requires very careful consideration, and that there are a number of points that require skilled attention.

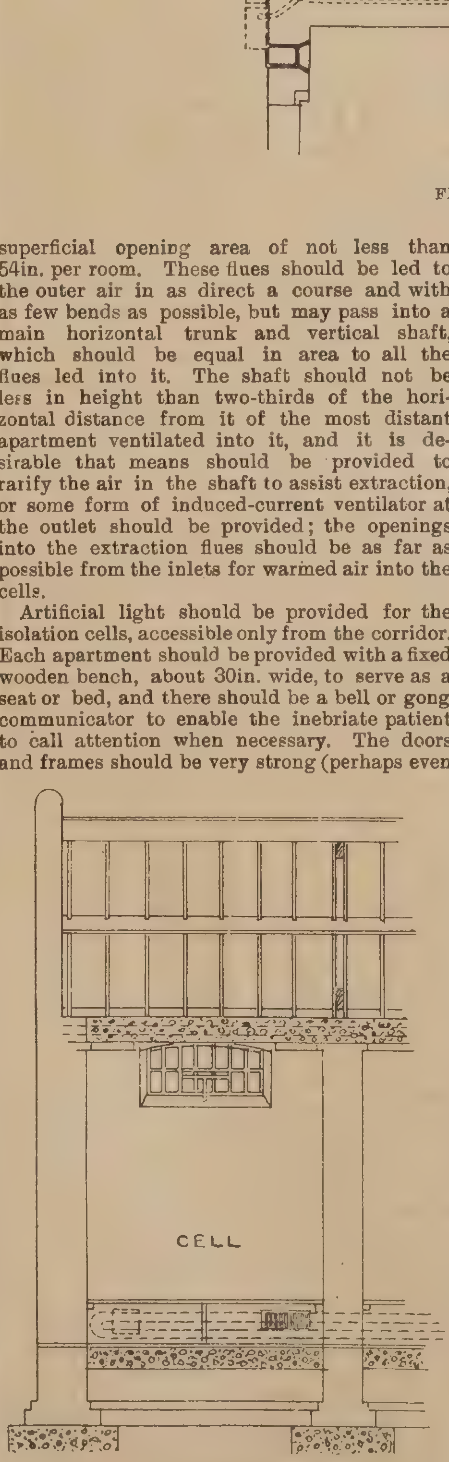


FIG. 2.

Visiting rooms of sufficient size, with lavatory and w.c. accommodation conveniently near, should be provided within a reasonable distance of the general entrance and of the inebriates' wards.

There should also be suitable sleeping accommodation for the domestic servants of the establishment: in large reformatories it may be convenient to provide in detached buildings sleeping accommodation for some of the attendants, and cottages for those of them who are married.

The general stores, workshops, laundry and similar offices should be on the north side, with entrances to them on that side, and be so arranged that there need not be more than one outer entrance to the steward's and workshops' courts, but conveniently placed for control by the steward from his office.

The various wards and apartments may be connected by covered ways or passages of communication, which ought to be no wider than necessary to give convenient access to the several parts of the building. As previously mentioned, steps should be avoided in these corridors as far as possible, and no incline should exceed one in forty.

The dormitories for the inebriate patients may have the beds arranged as shown in Fig. 4, that is, two beds between each window; in this illustration inlets for ventilation are shown between each window, while outlets for the vitiated air are provided in the roof.

The walls generally should be plastered or cemented internally; those of lavatories, bathrooms, water-closets, sculleries, laundries and kitchens should be lined to at least dado height with glazed bricks or tiles, and where the walls above are plastered it is an advantage to use adamantine plaster or Parian cement.

The windows of the day-rooms and corridors should be of sufficient size and number and bear due relation to the requirements of the room; the lowest clear glass should not be more than 2ft. 6in. from the floor; they should have wood

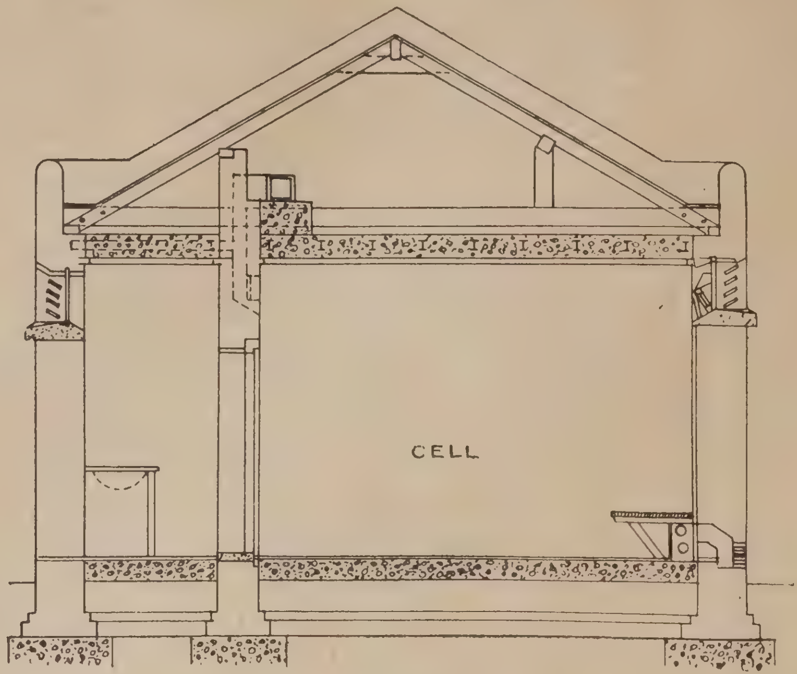


FIG. 3.

sashes, double hung, and be made to open easily so as to allow a free circulation of air. The walls below the sills of windows in dormitories may be splayed, but in day-rooms and wide corridors they should be recessed to admit a seat, if desired.

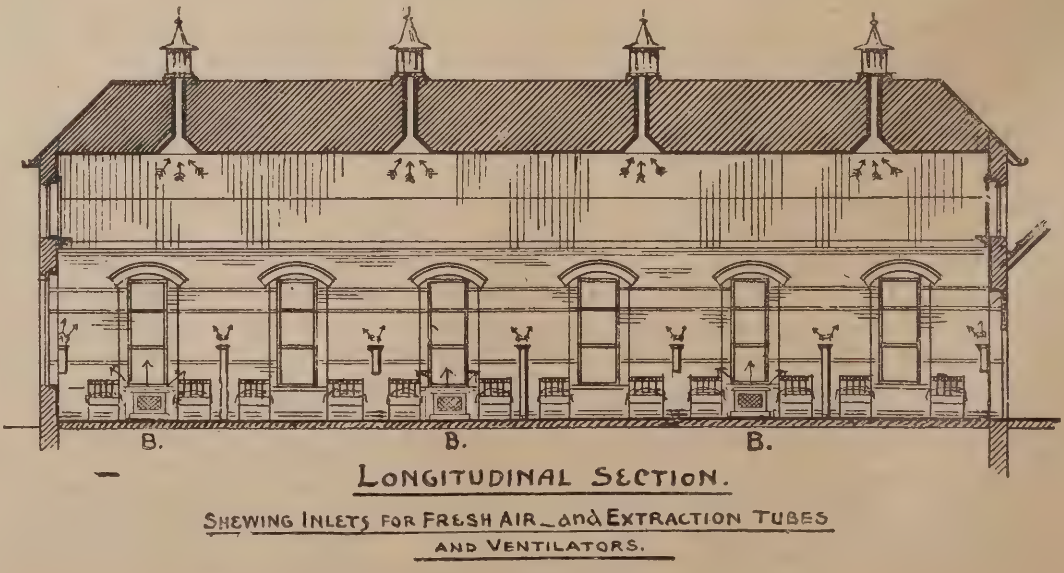
In the dormitories the windows should, as a general rule, not be placed with the bottom sill more than 4ft. from the floor; if not otherwise protected, the windows in all parts occupied by patients must be stopped so as to allow them to be opened top and bottom 5in.; the panes should be of moderate size, and in view of the suicidal character of some inebriates it would be safer for the sashes to be hung with concealed cords.

So far as is practicable, horizontal and vertical fireproof construction should be adopted, and the ceilings next below the roof should be constructed of fire-resisting materials.

In planning institutions for inebriates it is considered desirable to arrange for the separation from other inmates of persons of superior refinement and education, and men and women should not be allowed to be received in the establishment unless there is absolute separation of the grounds and buildings used by them.

The plans for an inebriates' reformatory should be prepared by the architect with the full understanding that the scheme of treatment is to be based on the principle that the inmates are to be detained for reformation, rather than for punishment, and towards this principle alike should be directed the dietary, the discipline, the recreations, the religious and moral training and the occupations of the inebriate patients.

Inebriates' reformatories are likely to be erected in many districts, and the best authorities state their belief that fifty per cent. of habitual drunkards might be permanently cured; but though the treatment is for reformation yet the building must be to a considerable extent a prison, a hospital and an asylum.



LONGITUDINAL SECTION.

SHEWING INLETS FOR FRESH AIR and EXTRACTION TUBES AND VENTILATORS.

FIG. 4.

Masters and Men.

The North of England Building Trades Dispute.—The arbitrator appointed by the Board of Trade in the dispute between the building trade employers and the bricklayers in the Newcastle district has given his award in favour of the masters. The men's demand was that their wages should be 11d. an hour instead of 10d. The masters offered that the wages should remain unreduced for a prolonged period; the men went on strike last June. The arbitrator has decided in favour of the employers.

The Sheffield Building Trades.—The workmen in the building trades of Sheffield held a meeting recently to consider the question of improving their organisation. The meeting took place under the auspices of the Building Trades Federation of Sheffield and District, which is some seven years old. This body has recently joined the Northern Counties Building Trades Federation, which now comprises the workmen of nearly a dozen towns. Resolutions supporting the principle of federation, and emphasising the necessity of more unity among the various trades to meet the increasing combination of employers and pledging the meeting to use every endeavour to strengthen the position of each individual society in the building trades, so as to help forward the cause of federation, were unanimously adopted.

The Cement Trade.—Following upon big discharges of men from the works at Rochester included in the combine of Associated Cement Manufacturers an intimation has been given that a new scale of pay for the workmen, representing a reduction of 40 per cent. in wages, will be introduced. The men affected by this order include those engaged in loading, unloading, and wash-mill work, kiln drawers, crane drivers and burners. About 400 men have left work. It is stated that the decision was come to owing to its being found impossible to manufacture cement at a price to enable them to compete in the continental and foreign markets and in supplying our own Colonies. At present notice of the reduction has only been given to the men employed at the Bridge and Quarry Works, Frindsbury. At Gillingham the millers have struck for 1d. a ton increase. Although they number only a dozen their action affects the whole factory. Half the factory has been shut down, affecting over one hundred men.

A Hull Dispute.—An extraordinary dispute which occurred recently between the operatives in the building trade in Hull and a firm of brewers, has ended in a victory for the men. The brewers are Messrs. Worthington and Co., and the complaint laid against them was that they had a contractor working at some of their property in Hull who did not pay the standard rate of wages. On Monday, the 4th inst., a meeting, at which 1,100 men attended, was held, when a resolution was passed pledging those present to abstain from frequenting the houses owned or supplied by Messrs. Worthington and Co. The boycott was strictly carried out both in Hull and in the district. The local manager of the company assured a deputation from the men that it was not the desire of his firm to employ inferior labour or to pay less than the standard rate of wages. As a matter of fact they were, he said, paying the contractor the full price, and if the labour was inferior they would be the sufferers. He promised that the cause of complaint should be immediately removed.

Standard Rates of Wages in 1900.—The Report of the Board of Trade Labour Department upon the Standard Rates of Wages and Hours of Labour in force in the United Kingdom at the beginning of 1900 has recently been published. The report gives the rates of time-wages and the hours of labour (exclusive of overtime) recognised in a large number of important industries in the principal towns of the country, and gives the wages and hours recognised at January 1st, 1900, and also at the beginning of each long series of years, while in another section are included tables showing the percentage variations which have been made in the course of a lengthy period in the wages of coal hewers, ironworkers and cotton operatives, and returns of the cash wages and earnings of agricultural labourers. A list of working rules and other documents regulating wages, hours of labour, and other working conditions in operation on January 1st, 1900, is given in an appendix to the volume. The report deals most fully and completely with the wages of bricklayers, masons, carpenters and joiners, slaters, plumbers, plasterers, painters and labourers. The report can be obtained from Messrs. Eyre and Spottiswoode, London, E.C.; John Menzies and Company, Edinburgh and Glasgow; or Hodges, Figgis and Company, Limited, of Dublin.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Stone Staircases.

GALLATOWN.—KIRKCALDY writes: "I am obliged for the reply to my query on page 14 of your issue for February 6th, but I still wish to know what rule 'I. W.' applies to determine that one wall should be 14in. thick and the other 18in. What amount of leverage is exerted by the hanging steps upon these walls, and how would the stability of the top flight be affected if the wall were only carried up, say, 4ft. above the level of the top floor? A gentleman tells me that he has seen such a stair with *both* ends open and no support underneath except the abutment in the feather edge of the step. Is this correct?"

I know of no fixed rule that applies, but assume the wall that carries the stairs has also to carry the floors of the apartments. This being so, I have given the least that I consider safe for the work the walls have do, and it must also be considered that the staircase in question is as a cantilever, but as to what amount of leverage is exerted I am not prepared to say. I think the stability of the top flight would be ensured if the walls were carried up as proposed. With regard to the last paragraph of the query, such a stair would be an impossibility with only the ordinary abutment on the feather edge of the steps. But a staircase can be made self-supporting by using an additional thickness of stone, making the back rebates of the steps "arch joints," and by working off the additional thickness about 12in. or 15in. from the end with an ogee it does not offend the eye. This is probably the kind of stair referred to. I. W.

Submitting Plans for "New Buildings."

AN OLD SUBSCRIBER writes: "A has pulled down an old house abutting on the main street within an urban district, where the Model By-laws of the Local Government Board are in force. He intends to rebuild on the same front foundations as the old house, but with increased depth, adding a storey in the roof and forming a new interior, without submitting plans to the council for approval, his contention being that it is not a 'new building,' and that he is not therefore required to submit plans. Is this so, or have the council control of the air-space in front applicable to a new building, and if not what steps should the council take in the matter?"

Both technically and in fact the house is a "new building," except in so far that it may be erected to the same frontage line and to the same height as formerly. Plans must be submitted, and the by-laws complied with.

G. A. T. M.

Assistant's Salary during Illness.

ROTHERHAM.—A READER FROM THE FIRST writes: "Is it usual in the profession for an employer to continue to pay an assistant's salary during his absence through sickness? In one instance an assistant who has been absent for a week writes stating that in all probability he will be able to resume his duties in the course of another week, and requesting that his salary may be forwarded. This, however, is refused."

For the credit of the profession it is to be hoped that there are very few architects who would deprive an assistant of his salary during illness, unless the illness be one of many months' duration, when, after a reasonable time, it is only to be expected that notice of dismissal would be served, or, at best, that salary would cease and the berth be kept open. We have occasionally—very occasionally—heard of treatment similar to that described by our correspondent, and usually when the assistant is so circumstanced that he dare not resign his position and sue for his due; and we suggest that such a case is best met by the assistant himself and *all* his fellows in the same office seeking employment elsewhere. G. A. T. M.

Measuring Pattern Glass.

SHREWSBURY.—D. and D.-L. write: "In measuring pattern glass, is not 1in. sufficient to allow in each sheet for any fractional part of an inch? In some pattern glass we have lately measured the glazier claims 1ft. for any measurement exceeding 10in."

The custom is to measure fractional parts of inches as full inches, and unless the equalising of the pattern in each square necessitated extra cutting, and a larger percentage of waste than is usual in cutting up glass sheets, there seems no reason why "custom" should be departed from; but in this latter contingency any claim should preferably be allowed for in an extra amount rather than in increased measurement. Reading between the lines and wording, the query as to whether it is customary to allow as a full foot any *superficial* measurement less than a foot enables the reply to be given that such is the custom for some kinds of glass, though the caprice of the glass merchants would seem to be the only rule governing the matter. H. E.

Architect's Fees for Valuation.

GALLATOWN.—KIRKCALDY writes: "With regard to Mr. Brand's reply on page 496 of your issue for January 30th, the fees seem high, and I think there must be a misunderstanding. The architect in question is not licensed as an appraiser, so why should the fees agreed upon by the surveyors and valuers have anything to do with him as a private agent? From page 85 of 'Specification,' Part 4, I understand that any architect can value property for the information of one party only, and can charge a fee for doing so. It is this fee that I wish to know about. The same paragraph of 'Specification' refers to the Act 46 of George III., chap. 43, applying to England and Wales and extended to Ireland, but as I am more interested in the question of architects in Scotland valuing for the information of one party and charging a fee, which I am told is not legal, perhaps Mr. Brand can say if it is so, and what the fees are."

It is entirely a question of agreement between the persons interested, and being a private matter, an architect cannot legally charge anything, though I have known architects (and even licensed valuers) charge a fixed sum of 1 per cent. on every £100 worth of property so purchased privately. There is practically no fixed scale for unlicensed persons. I have known instances where a small fee was charged, as low as £3 3s. for small properties worth £200 or £300; in one case £21 was paid in connection with a property worth £3,000. It is practically an arrangement between the architect and the person concerned. J. E. B.

Alterations in Competition Design.

GLASGOW.—J. M. writes: "In a limited competition A was the successful architect, his estimate for the proposed work being £15,000. Each of the other competitors were awarded a nominal premium. In carrying out the work large portions of the competitive design were omitted, and other work was done costing altogether £10,000. How should this be charged?"

It would be best to consult a copy of "The Professional Practice as to the Charges of Architects," to be obtained from the secretary of the Royal Institute of British Architects, 9 Conduit Street, W., price 7d. post free. If the alterations in the design were made before tenders were invited, it seems probable that 5 per cent. commission can only be charged upon the actual cost. G. A. T. M.

Elementary Mechanics and Physics.

OXFORD.—B. H. C. writes: "Kindly state what books should be studied for elementary mechanics and physics for the preliminary examination of the R.I.B.A., and whether I could prepare myself without assistance?"

Newth's "Natural Philosophy" is probably the best book. It is thoroughly sound, and not too difficult of comprehension. Whether, however, the subject can be mastered without assistance or not depends upon the capacity and education of the student. G. A. T. M.

Strength of Rolled Joists Embedded in Concrete.

LONDON.—ENQUIRER writes: "Could you give any formulæ, data, or reference as to determining the increase in strength given to rolled steel joists in a floor in which they are completely embedded in concrete. For example:—An 8in. × 4in. joist, 24ft. span (clear), I find to be equal to a safe distributed load of 4 tons, or 4 cwt. per foot run. Now, if these joists be placed 2ft. apart, but buried in concrete, to what extent are the joists increased in strength? I have some floors to design of this construction for a load of 2 cwts. per foot super. (gross) which must be kept as light as possible."

A rolled joist is not increased in strength by being embedded in a concrete floor unless it is so narrow as to be deficient in transverse stiffness and liable to fail by buckling sideways. The concrete itself under ordinary conditions of manufacture has little value as a beam over long spans, but the two materials together so divide the work that an increase of load is possible. In some cases known to the writer the combination of the two materials enables the rolled joists to carry more than double the load that would be safely supported if they were free. An 8 × 4 × 25lb. rolled steel joist of 24ft. span would require a factor of safety of $\frac{\text{span ft.}}{3{\cdot}5 \text{ depth ft.}}$ = say, 10 if free, or, say, 5 if embedded in concrete, to avoid excessive deflection. This would make the safe load about 3¼tons distributed, or, $\frac{3\frac{1}{4} \times 20}{24 \times 2} = 1{\cdot}354$cwt. per ft. sup. gross load, which would manifestly be too little. For a span of 24ft. the writer would use 12 × 5 × 39lb. rolled steel joists, having a modulus of 42·41, the distance apart being found thus:

Bending moment (M), Moment of Resistance (R)

$$M = \frac{WL}{8}, \qquad R = ZC$$

$$\therefore W = \frac{8\,ZC}{L} = \frac{8 \times 42{\cdot}41 \times 30}{24 \times 12} = 35\tfrac{1}{3}\text{tons}$$

distributed. 2cwts. per ft. sup. gross = say, ½cwt. per ft. sup. for weight of floor × 1½cwts. per ft. sup. for external load. This will allow for a maximum of 6in. thickness of concrete. Then 24ft. span × 2cwt. per ft. sup. × xft. width of centres = 35tons, allowing the odd ½ton for weight of joist. Therefore $x = \frac{35 \times 20}{24 \times 2}$ = 14ft. 6in. centre distance of main joists. A 2 × 2 × ¼ angle-iron should be riveted to the web on each side level with under side of concrete, and 6 × 3 × 13lb. rolled steel joists placed 2ft. 6in. centre to centre between the main joists, and attached to them by angle cleats. HENRY ADAMS.

Copyright in Designs.

LONDON.—ANXIOUS writes: "I am afraid there was a misunderstanding in regard to my former query, which appeared on page 33 of your issue for February 13th. I did not prepare a perspective at all, but was engaged by an architect to prepare a scheme (including all necessary drawings), which won the competition in question and is now being carried out under the architect's name (but really by myself). I can satisfactorily prove that all the design, &c., was my own. Would it be legal for me to have a perspective prepared and to insert it in any of the building journals simply as a design bearing my name without mentioning the architect's name in any way? If this is not right would it be possible to slightly vary the design, but still to retain the main character of the work, and then be still within the law? I have an impression that he could not do anything unless his design were copyrighted."

You do not state the extent to which the person who engaged you contributed to the production referred to. Upon the facts stated you are the author of such production, and can use it in the manner referred to since you do not appear to have parted with your ownership of the production, but to have merely permitted its use for a specific purpose. A. O. H.

Duties of a Borough Surveyor.

Glasgow.—Registered Plumber writes: "What are the duties of a borough surveyor, and what course is necessary to qualify for such a position? I already hold the Scottish Sanitary Association certificate."

It is not absolutely necessary to have passed any examinations in order to take the position of borough surveyor. Surveyors under the London Building Act of 1894 have to pass an examination held by the Royal Institute of British Architects. Particulars can be obtained from the secretary of the Institute at 9 Conduit Street, W. It would be as well to pass the Surveyors' Institution examinations, particulars of which can be obtained from the secretary, 12 Great George Street, Westminster, S.W. In Scotland the applicant for an ordained surveyorship has to satisfy an examining body as to his professional qualification, and is then "ordained" or "invested" in his office by the Sheriff of the Lothians and Peebles, or by the Lord Provost, magistrates and Council of Edinburgh. There is a Society of Ordained Surveyors that holds examinations which it would be as well to pass. The address of the Secretary to the Board is 56 Queen Street, Edinburgh.

Damp in Houses.

Longtown.—Inquirer writes: "I have several houses built of Cumberland sandstone. The walls are 18in. thick, yet the interior is very damp. It appears that this dampness arises from two causes: the very porous nature of the stone and the absence of a damp-course in the walls. What is the remedy?"

The porous nature of the stone may be treated in several ways. By painting externally with Szerelmey's Stone Liquid, Orr's Petrifying Liquid, or any similar preparation; these form a waterproof coat externally, but generally discolour the surfaces to which they are applied, and require renewing at intervals. By using the same preparations internally: in this case the appearance of the wall is not affected, but the rain is still free to penetrate the wall and inevitably destroy it in a short time. By painting with oil paint: this requires periodical renewal by forming a cavity on the inside; this is done by building an ordinary lath and plaster (or expanded metal and plaster) partition, the uprights being nailed to plugs inserted in the walling. This would materially reduce the size of the rooms if already small. Weather tiling or slating might also be suggested, but it is costly. The matter of the damp-course is more difficult to advise upon. If the building is of coursed masonry the theoretic solution is to remove one course in sections and then to insert a damp-course. This is, in fact, the only solution, a very expensive and troublesome one, and probably (we have not seen the building) impossible.

R. W. C.

Efflorescence on Walls.

London, S.W.—E. E. B. writes: "A friend of mine has built thirty-eight cottages in Essex: the last two are now being plastered. They are built with grizzles and place-bricks, and are plastered with sirapite plastering; the sand is sharp and clean. Recently unmistakable signs of efflorescence have appeared on the external walls, and internally the walls seem to be much damper than the rapidity in building would account for. The cement rendering in the scullery has entirely left the wall and bulged out; the recent frost might perhaps account for this, but I do not think it can account for all the indications of damp throughout the whole thirty-eight houses. The shape of the bricks comes out in dark lines on the plastering. Are these houses likely to be permanently damp, and is it because the bricks are made of clay containing too large a proportion of chloride of sodium?"

We should say that the damp and bulging are both due to the use of inferior materials and the rapidity of construction indicated. It is impossible for us to speak definitely, however, as we have not seen the work, but "grizzles" and "place-bricks" do not seem to us the right material to use even for cottages. You do not state the composition of your cement rendering, nor whether the work was done during or just before a frost. We assume that your walls are 9in. thick, and have not yet been thoroughly dried, as the houses are all in course of construction. The dark spots on the wall point to the bricks being so porous as to form water channels in the thickness of the wall, and if (as suspected) they contain an excess of chloride of sodium, they must be very inferior grizzles made from seashore or salt-formation clays; bricks which warp and twist and absorb moisture for years, and ought never to have been used at all. The houses will never be satisfactorily dry. R. W. C.

R.I.B.A. Intermediate Examination.

Windermere.—F. H. W. writes: "Is it necessary to know algebra, mechanics, physics and trigonometry for the intermediate examination of the Royal Institute of British Architects, provided the preliminary examination has been passed? If so, to what extent need these subjects be known?"

A knowledge of the four subjects named is necessary to pass the intermediate examination. See a reply to a similar enquiry on p. 477 of of our issue for January 23rd last.

Collar-Beam Roof.

Sheffield.—J. M. writes: "Would a roof framed as shown in sketch (not reproduced) in which the spars are tied across half-way up by the ceiling joists, with no purlins, be satisfactory with grey slates? Slope of roof 45 deg. The length of the building makes purlins undesirable, as framed trusses would be required to support them."

The roof sketched should be quite satisfactory; each pair of rafters and their ceiling joist becomes a collar-beam truss and would be suitable for a span of 15ft. The rafters should be notched on the wall-plates so as to give them a horizontal bearing. HENRY ADAMS.

GLASGOW EXHIBITION, 1901.

DECORATING THE GRAND DOME.

THE decoration of the grand dome of the Glasgow International Exhibition will be completed in about a week's time. About seven months ago the commission to execute a scheme of figure decoration was given to two young Glasgow artists, Mr. John Dall and Mr. David S. Neave, neither of whom had previous experience in mural painting. To the difficulties attendant on the designing of a space 226ft. in circumference and 65ft. in height, the artists had, of course, to face those matters which make dome decoration so much more onerous and troublesome to gauge than panel painting—the upward incline of the cup and the rounding of it. "The work now completing," says the "North British Daily Mail," "shows a design gay and light in its motive as befits the great crown of our summer palace, suave and elegant in its lines, and when the obstructions are removed we believe the committee will have every reason to feel gratified in their choice of artists, and Mr. Miller in having his noble structure so tastefully beautified."

There are thirty-two figures in all. On the cup or curved portion of the dome two large-winged angels with palms and laurels face one another, each with an attendant figure at either hand, the composition being connected by six groups of flying amorini. A gilt frieze runs round the circle, and below this are fitted at the window spaces eight seated figures in four groups, symbolic of industry, commerce, science and art. The whole is set in a very decorative landscape background of rolling hills and trees, over which stretches an evening sky rising from the yellow green at the base of the cumuli clouds to the high salmon-pink on the fringe of the cirrus. Above the violet sky arches to the top, and the zenith is studded with stars. The decoration begins at the second row of windows, 60ft. from the floor, and rises to 125ft. The large-winged figures are 18ft. from toes to helmet and 23ft. to the tip of the wings, the attendant ones measuring 16ft., and those seated at the base about 8ft. in height. Each form is silhoutted in white against its background.

The colour scheme is pitched in a very high key, but the artists, in avoiding any glaze or shine on their pigment, restrain the whole well back in its place, and the big simple lines of composition observe the just principle of mural decoration—and one not seldom neglected—that the painting should accentuate and not disguise the architectural form. Gold is used here and there.

The painting of the figures and accessories has been done by the artists within the Exhibition precincts in the brief space of six months. Each figure has been cut out of its canvas and hoisted into its place, where it is fixed to the wall. The work of assisting the artists and painting this scheme of landscape and cloud background has been managed by Messrs. Charles Carlton and Sons, 189 St. Vincent Street, Glasgow.

Professional Practice.

London.—Mr. Hans Lowenfeld's newly-erected theatre, the Apollo, in Shaftesbury Avenue was opened last week. The building has been planned by Mr. Lewen Sharp. The scheme of decoration is cream and gold, all the upholstering being done in crimson and old gold. The seating capacity is for 1,200 persons, and every seat commands an uninterrupted view of the stage, this great convenience being secured partly by the absence of pillars, partly by the fact that the stage slopes less and the various floors of the auditorium much more than is usual. The "rake" of stalls and pit is continuous from front to back, and nothing but an exceptionally obstructive "*matinée* hat" can prevent the spectator from seeing everything that goes forward upon the stage. In the pit comfort has been studied by making each seat a fauteuil. Promenades are provided at the back of the pit, dress circle, balcony, and gallery. A novelty is the creation of two "gallery boxes," one on either side of the house, which will hold a family party. The arrangements for ventilation and heating are of the most complete character; the entire air of the auditorium will be renewed several times every hour, being exhausted by means of pumps, while a system of electric thermometers automatically indicates by means of bells to an operator in the basement the rise or fall of temperature in any part of the house. Draughts have been guarded against by placing at every exit or entrance at least three doors between the auditorium and the street, and the lobbies are warmed by radiators. The exits are so numerous that the house can be emptied in two minutes, while the whole building is fireproof. The stage is large enough for the production of the most elaborate plays. There are twenty-three dressing-rooms, which, with the exception of five, occupy a separate block, with a rehearsal-room. The lighting is electric throughout, and to provide against breakdown two separate companies, each with two circuits, furnish the light. The two special novelties are in the arrangement of the orchestra and the lighting of the stage. The construction of the orchestra, of which Mr. Lowenfeld claims to be the author, is intended to produce the proper relation in the sound of the various instruments to each other, and to avoid any possible muffling by loss of tonality. The floor space of the orchestra is in the form of a hollow oval, and the surface is hard and highly glazed. A wooden sounding board is placed over this hollow surface, and a three-tier rostrum on glass legs stands on the sounding board. The violins are placed on the highest tier, the wood wind and remaining strings on the next, while the lowest part is assigned to the brass and drums. By this means the thin violin sound waves rise before being mixed with the stronger wood wind and bass sounds, while the brass and drums are so removed that they do not interfere with either. The hollow floor and sounding board reflect the whole mass of tone. The idea is a free adaptation of Richard Wagner's construction at Bayreuth. A novel method of throwing light direct on the faces of the actors, also stated to have been invented by Mr. Lowenfeld, has here for the first time been practically carried into effect. From a space between the stalls and dress circle boxes limelights illuminate the stage on the level of the actors' faces without destroying the illusion, as lights thrown from the circle do, a plan frequently adopted in America. By means of the scheme now adopted the faces are lit directly from the front and equally from both sides, so that the objectionable shadows are avoided. This plan is quite new, and seems a step in the direction of ultimately realising Professor Herkomer's dream of abolishing the footlights. The decoration of the box-fronts and circles is of white and gold. The walls are of a deep crimson, the seats and hangings red of a lighter shade, and on every seat is worked the badge of the "Goman" tribe of gipsies, a curious lion and lizard device, which has been adopted as the theatre's crest. The act-drop is after Watteau, to be in keeping with the Louis Quinze scheme of ornament and has been painted by Mr. Hubert Hooydonk. In order partially to empty the auditorium between the acts after the Continental fashion, each separate part of the house has a separate promenade and foyer. There is plenty of room everywhere, both before and behind the curtain, the arrangements behind including many novelties in the way of labour-saving and time-saving machinery for the handling of scenery.

Norwich.—The new Technical Institute has recently been opened. The area of the site on which it stands is about 18,000 super. ft., and the building has a frontage of 190ft. to the river and of 120ft. to St. George's Bridge Street. It consists of basement, ground floor, and first and second floor. Its general design consists of semi-octagonal piers running through from the basement to the springing level of arches on the first floor windows. An arcading of semi-circular arches connects the heads of these piers; each alternate pier is much larger than the remainder, and is carried through the second floor and parapet to terminate with cappings or with finials above the parapet. Roughly speaking the building is shaped like an L, the river being parallel with the shaft of the letter. It is of local bricks throughout, with Cossey brick mouldings and dressings, and stonework to the portico. The main entrance is in St. George's Bridge Street, with an entrance from Monastery Court. Access to the whole of the floors is by means of a principal staircase, leading from basement to roof. There is a large landing at each floor, from which a corridor runs from east to west the whole length of the building, and there is a second staircase at the east end. The second floor is devoted to art. Parallel with the river—*i.e.* on the north side—is an elementary room, a life room, and a room 25ft. by 90ft. The whole of the rooms are supplied with Tonk's patent fittings, by which casts, pictures, drawings, &c., can be conveniently suspended from the walls. Facing St. George's there is a modelling and casting-room, which is fitted up with modelling stands and with large sinks for casting purposes. To the same aspect there is a design room, fitted up with lecture table and students' tables, and also with a novelty in the shape of a white board for design purposes. On this floor is an art master's room, and a room for the assistant art teachers. The roof is sloping and glazed, and curtains are arranged in it by which the light can be adjusted. The first floor is devoted chiefly to science. Parallel with the river there is a balance-room, which adjoins the chemical laboratory, which is 54ft. by 24ft., and which is fitted up with students' working benches, fume closets, demonstration table, blackboards, &c. Adjoining this room is a preparation room, which separates the chemical laboratory from the chemical lecture room. The chemical lecture room is fitted with raised gallery designed so that the lecturer can always see the students and the students can always see the demonstration table. There is a spacious platform and lecture table, which is supplied with water, gas, compressed air, and electric power. Immediately behind the lecturer's table is a large fume closet, and on each side is a large sliding blackboard. Overhead are diagram frames. Adjoining the lecture theatre is a smaller class-room for general science work. On this floor, facing St. George's, there is a photographic room. There is also a large lecture hall, which will be devoted to experimental physics. This room is somewhat similar in its fittings to the chemical lecture room. In addition on this floor there is a drawing office, a room 24ft. by 42ft., fitted up with a lecture table, students' drawing tables, &c. There is also a room for the assistant science teachers. On the ground floor is the general entrance from St. George's, consisting of a vestibule, with a hall 14ft. by 12ft. On the right is a general office; on the left is the entrance to the principal's room, which opens into a committee room 24ft. by 38ft. On this floor, parallel with the river, there is first a students' common room, and two very large rooms which will be devoted to boot and shoe work, each measuring 24ft. by 54ft. Adjoining is a room which will be devoted to dress-cutting and needlework. In the basement, and parallel to the river, there is a students' common room. Next to this is a space of 24ft. by 54ft., which is completely devoted to the heating and ventilating arrangements, which have been carried out by the Blackman Ventilating Company, Ltd., of 443 Holloway Road, London. There is also a physical laboratory on this floor 24ft. by 84ft., fitted up with students' working benches, lecture table, blackboards, apparatus cupboards, stone slabs for delicate work, &c. Facing St. George's there is a workshop, measuring 24ft. by 49ft., which is to be devoted to plumbing; this room will contain a large cauldron for the melting of lead and the purification of used solder, together with a number of stoves for the heating of metals. It will also contain benches and other apparatus for this craft. Adjoining this is a photometric room, which will be used for experiments in light, such as the comparison of candle powers of different sources of illumination. Next to this is another room, 24ft. by 41ft., which will probably be used as a dynamo shop. The basement is below the level of the river. The remainder of the building is really an adaptation of part of the old Guardians' offices. It consists of a metal room, standing in an old crypt, and of a day manual training room, 30ft. by 32ft., which will be devoted in the day time to the training in woodwork of boys from the elementary schools, and in the evening to subjects like carpentery, joinery, and cabinet making. Above these are two other rooms, which will also be devoted to manual training and to kindred subjects. The Institute is lighted throughout by electric light. The architect is the City Engineer, Mr. A. E. Collins.

Selby.—A Cottage Hospital, having attached to it a Dispensary, was opened recently. The hospital stands at the bottom of New Lane, opposite the School of Art, and makes no pretence to architectural merit. It is a two-storey building of brick, with stone dressings. On the ground floor are waiting-room, dispensary, matron's room, store-room and accident ward, with bath-room. This ward is 22ft. by 26ft. by 12ft. high, and the walls are plastered in Portland and Parian cement. The floors are of pitch-pine boards, and the place is heated by means of Shorland's patent downdraught-stove. The ventilation is on an improved system. Upstairs are three bedrooms, and adjoining are the bath-room and linen closets. The roof is covered with Penrhyn slates and Staffordshire red ridge. The yard at the back is laid with cement concrete, and in front is an ornamental wood palisade. The cost of the building is said to have been about £1,500. It was erected by Mr. T. S. Ullathorne, of Selby, from designs by Mr. T. Brownlow Thompson, of Hull. The sub-contractors were Mr. A. R. Swift (plumbing), Mr. George Swift (painting), Mr. T. W. Swift (electric bells) and Messrs. H. Williamson and Co. (slating).

Steyning, Sussex.—A new Steyning Union Workhouse has been erected in the parish of Kingston-by-Sea, facing the Old Shoreham Road. The architects are Messrs. Clayton and Black, of Brighton, and the builders, Messrs. Parsons and Sons, of Hove. The construction has taken two and a half years. One of the advantages of the pavilion system upon which the Workhouse has been erected, is that it facilitates classification; that is, it enables a distinction to be made between deserving cases and those of a less genuine character, besides giving opportunity for better general supervision. There is a total accommodation for 480 inmates. The site, which is entirely surrounded by a 7ft. flint wall, covers 23 acres, 14 of which are laid out in market gardens. Just within the entrance are the quarters for the porter and porteress. The eastern half of the block contains the receiving wards, for males downstairs and for females upstairs. In the western side are the casual wards, and there is a separate entrance for males, communicating with the main road. In the receiving wards there are four wards for males and four for females together with a bath-room and a room for an attendant. Each ward is separate, self-contained, and fitted with sanitary appliances. To each set of wards also is attached a store for the paupers' own clothing. The upper, or female receiving wards are approached by an outside staircase and a covered balcony. There is no communication between the wards except from the outside. The casual, or vagrants' wards are all on the ground floor, and consist of associated ward cells together with bathrooms and sanitary accommodation. Hot and cold water is provided, and in the female section is a special bath for children. Attached to each male cell is a working cell in which the occupant can be put to stone breaking, pounding, oakum picking, &c., according to his capacity. The cells in both wards are warmed by hot water, and in each department in the tramp ward there is bell communication with the porter's lodge. Through the archway between the two wards is a road leading to the stables, boiler house, coal bunkers and stores, past the workhouse into the garden. Opposite is the main entrance to the administration block, passing on the right of the hall the master's office, and on the left a commodious committee room. From the corridor, which runs at right angles to the entrance hall, access is gained to the lavatory accommodation for the committee, and similar accommodation for ladies upstairs. Opposite the entrance hall, across the corridor, is the entrance to the master's house, which contains on the ground floor two rooms with kitchen and scullery, and on the upper floor three bedrooms, bathroom and lavatory. The dining hall, which is also to be used as a chapel, is reached on the ground floor from the corridor, which surrounds it on three sides. It is a lofty apartment, 86ft. in length and 40ft. in breadth, with a height of over 30ft. to the centre of the roof. It is lighted by windows going up into the pitch of the roof and has six entrances beside two doorways leading into the kitchen. At the south end of the room is a gallery over the corridor. A tiled dado runs round the apartment and the walls are in two shades of terra-cotta, with white friezes and cornices. The hall communicates directly on the north side with the kitchen, which is fitted with cooking apparatus sufficient for coping with the needs of 600 people. At the south-eastern end of the dining-hall are clothing stores and the matron's cutting-out room, officers' mess-room with stores above, and bathrooms and lavatories. The male dormitory blocks are divided into two portions by a corridor, the division being continued right up to the roof, thus making it practically two buildings, and the walls being specially constructed the risk from fire is minimised. All the floors in the building are fireproof. The outside walls are hollow, in order to prevent damp. The day wards are 64ft. long by 18ft. wide, with the addition of long bays on the south side. They are 10ft. in height

Attached to each day ward is a lobby with a sink and hot and cold water. There is a dado of glazed bricks round each room and the walls of the rooms are plastered and distempered. The dormitory wards, which are above the day wards, are of similar dimensions and are constructed in precisely the same way, except that they are without bay windows. Each dormitory is supposed to contain 30 beds, none of which will be placed under a window. They will, instead, be arranged into rows between the windows. There is lavatory accommodation attached to each dormitory. In each half of the dormitory blocks is a room for an attendant. The women's dormitory blocks are of exactly the same kind as those for the men. The big pounds are situated in the south-east corner of the garden. Under the western boundary wall are a range of sheds, root stores, coal stores and workshops. The boiler house is to the north-east of the administrative block. The boiler chimney is about 84ft. high above the ground, and is about 100ft. high from its foundations. The laundry consists of a receiving room, a foul-linen wash-house, containing large slate washing tanks, high-pressure washing machine, wash-house for ordinary purposes, with ordinary fittings, laundress's office and store room, large ironing room and delivering room, while upstairs is another drying room. In this building is the engineer's shop and a store place in the roof. Under the north wall of the Union is a six-stall stable and a cart shed.

Surveying and Sanitary Notes.

Gosport Drainage. — A Local Government Board enquiry was held recently into the application of the Gosport District Council to borrow £81,153 for the purpose of instituting a scheme of arterial drainage in the district.

Sanitary Work at Bristol.—A Local Government Board enquiry was held recently into an application of the Town Council for sanction to borrow, under the Public Health Act, 1875, the sum of £610 for the provision of a public convenience in Old Market Street. Mr. T. H. Yabbicom, city engineer, prepared the plans.

The Sanitary Assurance Association held its twentieth annual meeting last week at the offices, 5 Argyll Place, Mr. Andrew Stirling in the chair. The annual report set out that "reports as to the sanitary condition of houses, specifications of works required to remedy defects, supervision of such works and issue of sanitary certificates, have been continued on the plan initiated by the association in 1881. Not only owners and occupiers of dwelling-houses of various sizes, but county councils and school authorities, as well as proprietors of large hotels have sought the services of the association, and acted on the advice given in the reports, plans, and specifications of works furnished by its officers. The Council regret still to have to report that the principle of sanitary registration of dwellings and other buildings as first embodied in the Sanitary Registration Bill promoted by the association has not yet received the sanction of Parliament." The chairman, in proposing the adoption of the report, expressed his satisfaction at the continued prosperity of the association. Sir Vincent H. Kennett Barrington seconded the report which was supported by Messrs. Mark H. Judge, H. Rutherford, and Dr. Edward Willoughby and carried unanimously. Mr. Andrew Stirling was re-elected President of the Association, and Professor T. Roger Smith, F.R.I.B.A., and Professor Kenneth Macleod, M.D., were elected vice-presidents.

A Traceried Oak Screen has just been erected in St. Giles Church, Little Torrington, by Mr. Boundy, of the same place. New carved and traceried oak choir stalls are also being carried out by Mr. Rogers, of Exeter. The architect for both works is Mr. Harbottle Reed, of Exeter.

Engineering Notes.

The Isolation Hospital, Barnoldswick, is being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The Embankment Electricity Generating Station (which was fully illustrated in our issue for January 16th) was formally opened on Saturday last. The entire installation will be completed within a few weeks.

"Transbordeur" Bridges.—A Local Government Board enquiry was recently held into the application of the Runcorn Urban District Council for sanction to take up shares of £10,000 in the Runcorn and Widnes Transporter Bridge Company.

Electric Lighting Boards, Limited.—A special demonstration of the electric lighting boards and strips has been given at St. Petersburg before His Imperial Majesty the Czar of Russia, the Grand Duke Waldemar, and a large company and suite. The Czar and the Grand Dukes personally manipulated the lights on the boards.

Sky-scrapers.—The "B. and S." Folding Gate and Lift Company, of 19, 20 and 21 Tower Street, Upper St. Martin's Lane, London, W.C., are about to issue a wall-card giving views of many of the large "sky-scrapers" erected in New York during recent years. On the back of the card are views of one of the buildings in course of construction, and an article on the "sky-scraper." In one of the views six or seven-storey buildings (which are usual here) are seen in comparison with the monster erections of New York.

High-speed Travelling.—Mr. F. B. Behr is to read a paper before the Society of Arts on March 13th on the proposed high-speed electric "mono-rail" between Liverpool and Manchester. The Bill for the construction of this railway will shortly come before a Parliamentary committee. The length of the line will be 34½ miles, and the estimated cost of construction £1,776,821. The cars will be run at a speed of 110 miles an hour, and will accomplish the journey between Manchester and Liverpool in 20 minutes; the quickest time by the present routes is 45 minutes. It is not now expected that serious opposition will be offered to the Bill by any body, public or private.

Train Lighting by Electricity.—Messrs. Vickers, Sons and Maxim are now introducing an arrangement for electrically lighting railway carriages by which current is generated by a dynamo carried in a dust-proof casing under the frame of each coach and driven by a belt from one of the axles. Its most distinctive feature is the method adopted to keep the current at the voltage required by the lamps. The speed of the dynamo is allowed to vary with that of the train, but on its way to the lamps or storage battery the current has to pass through an automatic switch-board, the function of which is to ensure a constant potential of 30 volts. Another regulation is afforded by a resistance, also automatically operated. The Great Central Railway Company has just had a dining-car fitted with the system. The cost of maintenance is comparatively trifling.

Law Cases.

Defective Mortar: A Belfast Builder Fined.—In the Summons Court at Belfast recently a builder named William Hunter was summoned by the Corporation for using inferior mortar in some new houses now being erected at Shore Road, Belfast. Mr. Spiller (for the complainants) said that the material used could only be described as rubbish—a mixture of bad mortar, clay, and road sweepings. So bad was a portion of the work that a person drawing his finger between the bricks would cause the rubbish to come out, although the work had been done six or eight weeks previously. A notice was served on the defendant by the City Surveyor, but he continued to use the material complained of. The magistrates imposed the maximum penalty of £5 and costs.

Fined for not Submitting Plans. — Luke Rawnsley, quarry owner, of Queensbury, was recently charged before the West Riding magistrates, at Halifax, with having committed a breach of the by-laws of the Queensbury District Council. Defendant, it was shown, had erected piggeries, &c., in connection with property belonging to him in Long Lane without previously submitting plans to the Council for their approval. He was warned when preparing the foundations that the submission of plans was required under the by-laws. His excuse to the Bench was that, even if he had sent in plans, the by-laws gave the District Council no option but to sanction them. The magistrates imposed the full penalty of £5 and the costs.

New Patents.

These patents are open to opposition until March 30th.

1900.—**Smoke-Consuming Stoves.**—4,686. H. Perfett, 20 Fitzroy Street, Ipswich. The main draught is arranged to be taken from the lower part of the fuel, which is consequently highly heated, while the air and smoke from the top of the fuel are drawn down to a point where they meet the flames below; here the smoke is consumed.

Glue Manufacture.—17,966. L. L. Kelsey, Guildford, New Haven, Connecticut, U.S.A. By this invention a mass of hot liquid stock is reduced under pressure to a plastic state, and then formed into pencil-like strips, which are afterwards dried. It is claimed that with these strips the glue can be made ready very quickly, and there is no chance of "caking."

Window Blinds.—19,214. C. A. Baker and J. E. Darby, both of Wankesha, Wisconsin, U.S.A. The main feature of this invention is that the blind is provided with ball bearings, so that it may work more easily and rapidly.

Casement Hinges.—19,733. F. T. Wonnacott, St. Helens, Monmouth Road, North End, Portsmouth. The hinge consists of two parts—an ordinary strap hinge having at the end nearest the centre of the window a flap or half hinge. Ordinarily the casement is held by a thumb screw, but when this is unfastened the casement is free to turn on its centre hinge—for cleansing purposes.

Sawing Machines. — 29,045. R. Logan, Worsley, Western Australia, and J. C. Port, Adelaide Terrace, Perth, Western Australia. This machine is specially applicable for cutting blocks for wood paving. On a cylinder driven by power sections of saw-teeth are fixed at given intervals. In this manner cuts of a certain depth and length can be made while the material is being fed continuously forward.

The following specifications were published on Saturday last, and are open to opposition until April 6th. A summary of the more important of them will be given next week.

1899.—21,829, Wilkinson, brick dies.

1900.—2,420, Ridgway, self-flushing time-valve for sewage distribution. 4,498, Barr, pipe couplings. 4,736, Arzt, gas for illuminating and heating purposes. 4,825, Wilson, saw teeth for cutting wood or other materials. 5,421, Budden, means for consuming smoke in fireplaces or furnaces. 5,448, Bartl, dampers for the chimneys of private houses. 5,992, Smith, filters. 6,013, Norris and Ball, ventilators for drains. 8,048, Grode, manufacture of balusters, pillars, &c. 17,230, Tait, water-filtering apparatus. 17,826, Tubbs, window sashes and frames. 19,484, Wills, expansion joint for connecting ware and metal pipes. 22,043, Riggs, nut-tapping machines. 22,151, Elrick, curved junction-eye for clay and metal pipes. 22,226, Berthold, automatic gas-lighters. 22,897, Wehner, Maltner and Bansen, stop valves. 23,021, Noakes, telescopic elevators. 23,211, Fireproof Partition Syndicate, Ltd., and Cammell, fireproof partitions having a metallic framework. 23,879, von dem Borne and von Debschütz, manufacture of polychrome ware.

Keystones.

A new Theatre for Hammersmith is to be erected shortly on a site at the corner of Rowan Road, close to Hammersmith Broadway.

Mr. G. A. W. Reeve-Reeve, architect and surveyor, of 27 Allens Road, Southsea, has opened additional offices at the Albert Hall Chambers, Portsmouth.

Mr. Charles Herbert Shoppee, F.R.I.B.A., F.S.I., the eldest son of the late Mr. C. J. Shoppee, of 41 Mecklenburgh Square, W.C., was married to Miss Jemima Fountain, the daughter of the late Mr. William Fountain, of Leicester, recently.

A new Hospital for Southport.—A Local Government Board enquiry was held last week into an application by the Southport Corporation to compulsorily acquire about ten acres of land in the parish of Scarisbrick for the erection of an infectious diseases hospital.

The new Church of St. Luke's, Thornaby, is to be erected complete, instead of only a portion being completed first. The first contract was for £4,656, but the decision to complete the whole building will entail an extra cost of £2,000, making the total cost nearly £7,000.

A Memorial Portrait of the late Sir Charles Hall, who represented Holborn in Parliament from 1892 to 1900, and who was the Recorder of the City at the time of his death, has been placed in the Holborn Town Hall, W.C. The painting was executed by the Hon. John Collier.

Harrogate Improvements.—A Local Government Board enquiry was held last week into the application of the Corporation of Harrogate for sanction to borrow £49,000 for a kursaal to be built on the Spa Estate, for the purchase of the Starbeck baths and springs, and for other purposes.

In the Parish Church of Egloshayle a memorial to the late Professor H. Shuttleworth, of St. Nicholas Cole Abbey, London, who died in October last, has been erected. An urn containing the cremated ashes of his remains has been placed under a memorial tablet sculptured by Mr. Harry Hems, of Exeter, in the north wall of the church.

A Discovery made recently in Aldgate High Street of what is believed to be the foundation of the two towers on this particular entrance in Old London Wall will probably lead to some further archæological finds. The original gate was taken down in 1606, and its successor was still standing in 1761, although not long after it was privately purchased and re-erected in Bethnal Green.

Corston Parish Church has been restored. The work carried out consists in the enlargements of the chancel, the conversion of the high-backed pews to a more modern style, the cleaning of the interior of the church, and the commencement of the erection of a north aisle, the eastern portion of which had only been done. The work was carried out by Messrs. Downing and Rudman, of Chippenham.

Hyde Park Place, a line of some twenty century-old houses stretching from Stanhope Street, Bayswater Road, to Albion Street, and facing Hyde Park, is now being demolished. The spot is just beyond the Marble Arch and Connaught Place, and is chiefly distinguished by the appearance in its midst of a Chapel-of-Ease of St. George's, Hanover Square, built eight years ago on the site of the old Mortuary Chapel of the St. George's Burial Ground.

The Royal Academy Exhibition, 1901.—The receiving days for intended exhibits this year will be as follows:—Water-colours, miniatures, black and white drawings, engravings, etchings, architectural drawings, and all other works under glass, Friday, March 29th; oil paintings, Saturday, March 30th, and Monday, April 1st; sculpture, Tuesday, April 2nd. Works will only be received at the Burlington Gardens entrance. Hours for the reception of works 7 A.M. to 10 P.M. Forms and labels can be obtained from the Academy during the month of March on receipt of a stamped and directed envelope.

A new Town Hall for Newcastle is proposed to be erected. The committee of the Corporation appointed to consider the question have recommended the Council to secure the Singleton House site for such a purpose.

A Leeds Competition.—Mr. Leonard Stokes (of London), the assessor appointed by the Leeds Corporation in the competition for a Branch Free Library in Nineveh Road, Leeds, has awarded the first premium to Mr. William Bakewell, F.R.I.B.A., of 38 Park Square, Leeds.

Turkish Baths for Carlisle.—Mr. C. B. Newton, manager of the Carlisle Gas- and Water-works, has prepared plans, which have been approved by the Town Council, for the provision of Turkish baths at the Corporation Baths. The new baths will cost about £2,000, and provide accommodation for about a dozen persons.

The Collegiate Church of St. Saviour—the cathedral-designate of the future diocese—is to be restored, and a collegiate house erected. For the former purpose a sum of £6,000 is required. £300 of this is for the repair of the tower, and other exterior and interior work is equally needed. For the purchase of a site and the erection of a choir-vestry the sum of £3,000 is required and a sum of £4,000 for the erection of the collegiate house.

London Matriculation Directory, 1901.—We have received a copy of this book from the University Correspondence College Press. It gives full particulars about the curriculum and the examinations, and is of considerable help to students. We note that one out of every six persons matriculating at London University is a student of University Correspondence College. The Directory may be obtained at 32 Red Lion Square, Holborn, W.C., price 1s. nett.

A new Church at Kirkcaldy has been erected in place of the old Dunnikier United Free Church. The site, however, has been changed somewhat to suit the movements of population, and the new building has an elevated position close to the railway, where it will serve the newer part of the town. It was designed by Mr. John B. Wilson, Glasgow, in Scottish Gothic style of the late decorated period. A feature is the decoration, which has been carried out in low harmonious tones of colour, enriched by bands of ornament on the walls, and contrasting well with the grey stonework of the interior, and the soft green staining of the seating. The church is fitted for electric light. It is seated for 740, and has a hall for 260 attached, with session-room, vestry, cloakroom, &c.

A Large Building Project in Newcastle.—A block for the erection of new buildings in the Side and Dean Street have been approved. The new buildings will cover the whole of the land now occupied by old property at the head of the Side, and the large corner block at the junction of Dean Street and the Side, and extending up Dean Street to the new offices of the Manchester Fire Assurance Company. In addition to this, a large portion of the property facing the Cathedral behind Amen Corner has been purchased. It is the intention of the new owners to erect a palatial block of offices, &c., the area of which will cover about an acre. Messrs. Marshall and Tweedy are the architects for this important building project. The cost of the whole of the undertaking is estimated to be between £200,000 and £250,000.

The Parish Church of Wrexham, dating from the 15th century, is popularly known as one of the seven wonders of Wales, and its tower is by competent authorities considered one of the finest examples of perpendicular architecture in the United Kingdom. Although during the last 30 years large sums of money have been spent upon the fabric, Messrs. Prothero and Phillott, of Cheltenham, the well-known architects, have reported that the tower and external structure of the church require immediate and careful reparation. The cost of such reparation will amount to £9,000, and the reparation of the two uppermost tiers of the tower and of the roof and clerestory windows is now being proceeded with at a cost of nearly £4,000. Mr. Thompson, of Peterborough, is the builder.

Mgr. Avon, Bishop of Guadeloupe, who was the author of archæological and other works, died last week at the age of 53 years.

Church Gresley Church.—The parish church committee, appointed to report upon the present condition of the fabric, restored in 1786 and 1872, have decided to thoroughly repair and renovate the ancient edifice, and to build a new church. The site is at the extreme limit of the parish, between Landsdowne and Wilmot roads, and when completed will provide church accommodation for the new adjoining populous areas of Gresley and Swadlincote.

Stockport Workhouse Scheme: the Architect's Charges.—At a recent meeting of the Stockport Board of Guardians, the report of the committee appointed to consider the account of Mr. Ward, architect, for the preparation of plans of the proposed new workhouse at Stepping Hill was adopted, after some discussion. The arrangement come to is that Mr. Ward accepts the further sum of £1,750 in settlement of his account to date, and in the event of the Guardians instructing him to carry out the scheme as approved by the Local Government Board he will be prepared to fulfil his original engagement to finish the work and receive the balance, plus anything else that might accrue, in full settlement for his services.

The New Art Gallery in Whitechapel is to be opened on March 12th, and a large number of valuable and interesting works have been promised for the loan collection to be exhibited there. The collection will be particularly rich in works by Ford Madox Brown, including "Don Juan and Haidée," "Cromwell, Milton and Marvel," "The Traveller," "Cromwell on his Farm," and the portrait of Professor and Mrs. Fawcett. Millais will be represented by "The Carpenter's Shop." Valuable portraits by Vandyke and Lely and a group of Canaletto's Views of London have been offered; but it is uncertain whether the authorities of the gallery can afford the necessary insurance unless they are enabled to do so by further offers of financial assistance.

Glasgow Royal Infirmary Competition.—Dr R. Rowand Anderson writes to the "Glasgow Evening News" with reference to an interview with Sir David Richmond, published in its columns:—"In that article Sir David Richmond is reported to have said, 'We engaged Dr. Rowand Anderson as technical adviser—not assessor.' My appointment, taken from the minutes of the meeting of the committee on plans for the reconstruction of the Glasgow Royal Infirmary, dated 7th March, 1900, is in the following terms:—'The sub-committee thereupon agreed to appoint, and hereby appoint, Dr. Anderson assessor to the committee.' In the printed terms and conditions of competition issued to architects it is stated that the committee will 'appoint a neutral architect of standing as assessor, and will give the fullest consideration to his advice.'"

St. Lawrence's Church, Wymington, described by Freeman as that exquisite "Decorated" church, is to be repaired. Erected in the fourteenth century by John Curteys, Mayor of the Woolstaple at Calais, the building has escaped serious interference from restorers and repairers, but it seems the time has come when important measures must be taken to prevent the sacred edifice from falling into hopeless decay. Mr. Charles Blomfield has prepared a report on the condition of the building, and has made suggestions in a conservative spirit, which it [illegible] expected will be adopted. For the present the roof and walls require most attention, and other necessary improvements may be postponed. The tower and spire are especially noticeable, and the east end is flanked by octagonal turrets capped by heavy battlements. There is much elaborate tracery in tower and spire, and numberless allusions in stone to the woolstapler's industry. Between nave and chancel there is no external mark of separation, but there are chapels north and south dedicated to St. John and the Blessed Virgin. Under a beautiful ogee arch between the chancel and the south chapel is an altar-tomb of the founder and his wife, and in various parts of the church are many very fine brasses. There is also some excellent carved oak.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
	BUILDING.		
Mar. 1	London, S.W.—Portland Cement	County Council	Manager, L.C.C. Works Dept., Belvedere Road, Lambeth.
,, 1	Ulrome, Bridlington—Chapel	Wesleyan Trustees	S. Dyer, Architect, Bridlington.
,, 1	Great Yarmouth—Cold Storage Premises	Norfolk Cold Storage, &c., Co., Limited	G. F. Geoghegan, 32 Prince of Wales' Road, Norwich.
,, 1	Nottingham—Shedding, &c.	Agricultural Society	W. H. Bradwell, Secretary, Thurland Street, Nottingham.
,, 1	Holywell—Shed	Union Workhouse	P. H. Roberts, Union Offices, Holywell.
,, 2	Ambleside—New Residence	G. Cragg	G. L. Hoggarth, 69 Highgate, Kendal.
,, 2	Glamorgan—Police Stations	County Council	County Surveyor's Office, Bridgend.
,, 2	Accrington—Boarding	Cricket Club	J. Darbyshire, Secretary, Accrington.
,, 2	Newtyle (Scotland)—Church	United Free Church	Mr. Robertson, Estate Office, Newtyle, Scotland.
,, 2	Stanhope—Town Hall	Urban District Council	J. Thompson, Solicitor. Stanhope, Durham.
,, 4	Darlington—Closets, &c.	Parks Committee	Borough Surveyor, Town Hall, Darlington.
,, 4	Walsall—Enlarging	Corporation	J. R. Cooper, Town Clerk, Borough Offices, Walsall.
,, 4	Erith—Cottages	Urban District Council	C. H. Fry, District Council Offices, High Street, Erith.
,, 4	Aberdare—Alterations, &c., to Chapel	——	G. Jones, Bryngafel, Trecynon, Aberdare.
,, 4	Farnham—Offices, &c.	Urban District Council	93 West Street, Farnham.
,, 4	Pontnewynydd, Wales—School	School Board	Landsdowne and Griggs, Architects, Newport, Mon.
,, 4	Liscard, Wallasey—Engine, Pump House, &c.	Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
,, 4	Liscard, Wallasey—Car Sheds, &c.	Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
,, 4	Liscard, Wallasey—Extension of Engine House	Urban District Council	J. H. Crowther, Engineer. Great Float, near Birkenhead.
,, 4	London, W.—Underground Convenience	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
,, 4	Felixstowe—Hotel	D. A. Tollemache	T. W. Cotman, Architect, Northgate Street, Ipswich.
,, 4	Cheltenham—Private Boarding School	——	T. Malvern, 21 Winchcombe Street, Cheltenham.
,, 4	Frome—Separation Wards	Guardians	J. A. Benyon, Architect, Nunnery Road, Frome.
,, 4	Darlington—Water-closets and Clock Tower	Park Committee	Borough Surveyor, Town Hall, Darlington.
,, 5	Glasgow—Workshops	Corporation	A. B. M'Donald, City Engineer, City Chambers, Glasgow.
,, 5	Wooten Basset, Wilts.—Passenger Station	Great Western Railway	Engineer, Great Western Railway Company, Paddington, W.
,, 5	Thorpe, Norfolk—Builders' Materials	——	G. Smith, Clerk of Works, County Asylum, Thorpe.
,, 5	Worsley and Pendlebury—Two Cottages and Stores	Manchester Corporation	Secretary, Waterworks Offices, Town Hall, Manchester.
,, 5	Bradford—Generating Station	Electricity Works	F. Stevens, Town Clerk, Town Hall. Bradford.
,, 5	Manchester—Cottages	Corporation Waterworks Committee	Secretary, Waterworks Office, Town Hall, Manchester.
,, 5	Welwyn—Additional Premises	Guardians	T. J. Sworder, Union Offices, Welwyn, Herts.
,, 6	Bideford—Cottage	Town Council	Surveyor, Council Offices, Bideford.
,, 6	Dublin—Cottages	Rural District Council	J. O'Neill, Clerk, North Brunswick Street. Dublin.
,, 6	London, S.W.—Boundary Wall	Fulham Borough Council	C. Botterill, Borough Surveyor, Town Hall, Walham Green, S.W.
,, 7	Downpatrick—Rectory	——	Estate Office, Downpatrick.
,, 7	Rhymney—19 Villas	Building Company	J. Ll. Smith, 50 High Street, Merthyr Tydfil.
,, 7	Sheffield—Lodge and Shelter	Park Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
,, 7	Loughbrickland—Central Dairy	Committee	H. Hobort, Architect, Dromore, County Down.
,, 8	Cheltenham—School	——	T. Malvern, 21 Winchcombe Street, Cheltenham.
,, 9	Fishguard—School Buildings	Managers	G. Morris, Clerk, High Street, Fishguard, Pembroke.
,, 11	Wanstead—Walls, &c.	School Board	J. T. Bressey, 71 Bishopsgate Street Within, E.C.
,, 11	Warminster—Schools	Urban Council	W. H. Hardick, Architect, Warminster.
	ENGINEERING.		
Mar. 1	Swansea—Heating, &c.	Corporation	G. Bell, 13 Somerset Place, Swansea.
,, 1	Maidenhead—Weighbridge	Union Workhouse	W. Weed, Clerk, Queen Street Chambers, Maidenhead.
,, 1	Paisley—Pipe Track, &c.	Water Commissioners	J. Lee, C.E., 13 Gilmour Street, Paisley.
,, 2	Lowestoft—Timber Protection Wall	Town Council	G. M. Hamby, Borough Engineer, Town Hall, Lowestoft.
,, 2	Romsey, Hants—Flushing Works	Guardians	Mr. Jenvey's Office, Market Place, Romsey.
,, 2	Stafford—Steam Boiler	Guardians	W. Blackshaw, Borough Hall, Stafford.
,, 2	Bournemouth—Electric Cars	Town Council	F. W. Lacey, Borough Engineer, Municipal Buildings, Bournemouth.
,, 2	East Dereham—Purifiers	Urban District Council	H. Kitson, Gasworks, East Dereham.
,, 4	Luton—Wiring	Town Council	Borough Engineer, Luton.
,, 4	Lincoln—Boring	Waterworks Committee	P. Griffith, 54 Parliament Street, Westminster, S.W.
,, 4	Egremont—Overhead Equipment, &c.	Wallasey Urban District Council	J. H. Crowther, Great Float, near Birkenhead.
,, 4	Manchester—Electrical Equipment	Tramways Committee	J. M. M'Elroy, Tramways Department, Town Hall, Manchester.
,, 4	Kirkintilloch—Reservoir	Town Council	W. R. Copland, C.E., 146 West Regent Street, Glasgow.
,, 4	Wicklow—Groynes	Urban District Council	J. Pansing, Town Surveyor, Church Hill, Wicklow.
,, 4	Coventry—Electric Lighting	Sanitary Committee	J. E. Surdlehurst, City Engineer, St. Mary's Hall, Coventry.
,, 6	Grantown-on-Spey—Electric Light	Town Council	W. Forsyth, Town Clerk's Offices, Grantown-on-Spey.
,, 6	Stockport—Condensers	Gas and Electric Committee	Gas and Electricity Department, Portwood, Stockport.
,, 7	London, S.W.—Pumps, &c.	Admiralty	Admiralty Pattern Rooms, 72 Great Queen Street, Lincoln's Inn, W.C.
,, 7	Manchester—Lift	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
,, 8	Leeds—Trolley Wires and Attachments	Tramways Committee	City Engineer, Municipal Buildings, Leeds.
,, 11	Glasgow—Crane	Clyde Navigation Trustees	T. R. Mackenzie, 16 Robertson Street, Glasgow.
,, 11	Bewdley—Waterworks	Corporation	R. E. W. Berrington, Civil Engineer, Wolverhampton.
	IRON AND STEEL.		
Mar. 1	Paisley—Pipes	Water Commissioners	J. Lee, C.E., 13 Gilmore Street, Paisley.
,, 1	Swansea—Cast-iron Pipes, &c	Town Council	Waterworks Engineer, Guildhall, Swansea.
,, 4	Manchester—Grids, &c.	Corporation	Manager, House Drainage Department, Manchester.
,, 4	London, W.—Iron and Steel, &c.	Paddington Borough Council	Surveyor's Office, Town Hall, Paddington, W.
,, 5	Thorpe, Norfolk—Engineer's Fittings, Pipes	——	G. Smith, Clerk of Works, County Surveyor, Thorpe.
,, 6	London, E.C.—Steel and Iron Works	Shoreditch Borough Council	C. N. Russell, Electrical Light Station, Coronet Street, Hoxton, N.
,, 6	Colchester—Iron and Steel Work, &c.	Roads and Drainage Committee	Borough Surveyor's Office, Stanwell Street.
,, 11	Workington—Pipes, &c.	Corporation	J. Eden, 58 Pow Street, Workington.
,, 12	Norwich—Ironwork	——	A. E. Collins, City Engineer, Guildhall, Norwich.

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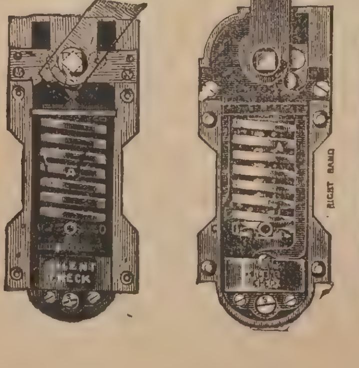

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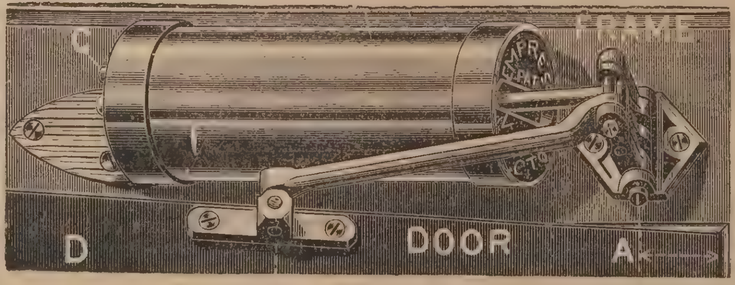

Fig 1, as fixed on face of door.

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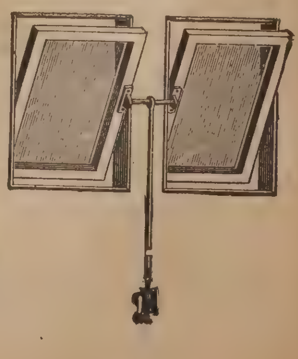

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	PAINTING AND PLUMBING.		
Mar. 1	Cairo—Paints, &c.	Barrage Administration	Barrage Administration, Cairo.
„ 1	Midland Railway—Cleaning and Painting	Midland Railway Company	Engineer's Offices, Derby Station.
„ 4	Manchester—Painting Work	Sanitary Committee	City Surveyor's Office, Town Hall, Manchester.
„ 4	Manchester—Oils, Paints, &c.	Rivers Committee	Secretary, Rivers Department, Town Hall, Manchester.
„ 8	Manchester—Painting Work	Corporation	Secretary, Waterworks Offices, Town Hall, Manchester.
„ 8	Derby—Paints, Oils, &c.	Town Council	J. Ward, Borough Surveyor, Babington Lane, Derby.
„ 8	Thirlmere Aqueduct, Manchester—Painting Bridges	Corporation	Secretary, Waterworks Offices, Town Hall, Manchester.
„ 9	Burntwood, near Lichfield—Repainting	—	W. H. Cheadle, County Surveyor, Stafford.
	ROADS AND CARTAGE.		
Mar. 1	Hampton Wick, Middlesex—Horsing Vans, &c.	Urban District Council	Council Offices, Hampton Wick.
„ 1	Withington, Lancs—Streets, &c.	Urban District Council	A. B. Mountain, Surveyor, Town Hall, Withington.
„ 1	Sandridge—Repairs, &c.	—	S. Norman, Upper Culver Road, Sandridge.
„ 1	Croydon—Horses, Carts, &c.	County Council	Surveyor's Office, Town Hall, Croydon.
„ 1	Blackhill, Durham—Footpaths	Consett Iron Company, Limited	C. E. Oliver, General Offices, Consett.
„ 1	Croydon—Materials	Corporation	Borough Road Surveyor, Town Hall, Croydon.
„ 1	Staines—Macadam	Rural District Council	Surveyor, Council's Offices, London Road, Ashford, Staines.
„ 2	Whitley, Northumberland—Whinstone, &c.	Urban District Council	J. Moore, Council Offices, Whitley, R.S.O.
„ 2	Doncaster—Dross and Granite	Rural District Council	W. R. Crabtree, Union Offices, High Street, Doncaster.
„ 2	Radcliffe, Lancs—Laying-out Park	Urban District Council	W. L. Rothwell, Surveyor, Council Offices, Radcliffe.
„ 4	Abingdon—Stone	Rural District Council	B. and E. M. Challenor, Council Offices, 59, Stert Street, Abingdon.
„ 4	London, W.—Ashphalte Paving	Paddington Borough Council	Surveyor's Office, Town Hall, Paddington.
„ 4	London, W.—Granite, Kerb, &c.	Paddington Borough Council	Surveyor's Office, Town Hall, Paddington.
„ 4	Thames Ditton—Materials, &c.	Urban District Council	A. J. Henderson, Council Offices, Thames Ditton.
„ 4	Thorne, near Doncaster—Dross Screenings, &c.	Rural District Council	G. Kenyon, Plantation Road, Thorne.
„ 4	Paddington, N.W.—Works and Materials (4 Contracts)	Borough Council	Surveyor's Office, Town Hall, Paddington.
„ 4	London, N.—Works and Materials (14 contracts)	Hornsey Urban District Council	E. J. Lovegrove, Engineer to the Council, Southwood Lane, Highgate.
„ 5	Maidstone—Maintenance of Roads	Kent County Council	F. W. Ruck, 86 Week Street, Maidstone.
„ 5	Tottenham—Wood paving	Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
„ 5	Middlesex—Broken Granite (Two Contracts)	County Council	H. T. Wakelam, County Surveyor Guildhall, Westminster.
„ 5	Hampton—Granite Chippings, Flint, &c.	Urban District Council	Council Offices, Park House, Hampton.
„ 5	Wandsworth, S.W.—Paving	Borough Council	Council House, East Hill, Wandsworth.
„ 5	Huddersfield—Motor-carts	Corporation	A. B. Mountain, Electricity Works, Huddersfield.
„ 5	Milton—Road Material	Urban District Council	W. A. Farnham, Town Hall, Milton-next-Sittingbourne.
„ 5	Mountain Ash, Wales—Street Improvements	Urban District Council	J. Williams, Town Hall, Mountain Ash.
„ 5	Leyton—Granite	Urban District Council	Surveyor, Town Hall, Leyton.
„ 6	Colchester—Various	Roads and Drainage Committee	H. Goodyear, Stanwell Street, Colchester.
„ 6	Oldham—Granite, pipes, &c.	Tramways Committee	Borough Surveyor's Office, Town Hall, Oldham.
„ 6	Ormskirk, Lancs—Paving, &c.	Rural District Council	C. Law-Green, Union Offices, Wigan Road, Ormskirk.
„ 6	South Shields—Materials	Corporation	S. E. Burgess, Borough Engineer, Chapter Row, South Shields.
„ 7	Littlehampton, Sussex—Brick Paving, &c.	Urban District Council	H. Howard, Town Offices, Littlehampton.
„ 7	London, W.—Making up	Ealing Urban District Council	C. Jones, Public Buildings, Ealing, W.
„ 8	Derby—Granite, Gravel, &c.	County Council	J. Ward, Borough Surveyor, Babington Lane, Derby.
„ 8	Hull—Stone	Corporation	A. E. White, City Engineer, Town Hall, Hull.
„ 8	High Wycombe—Flints	Rural District Council	A. L. Grant, Crown Lane, High Wycombe.
„ 9	Worcester—Road Stone and Slag	Highways and Bridges Committee	J. H. Garrett, Shire Hall, Worcester.
„ 11	Grassendale, Lancs—Materials	Urban District Council	F. W. Bowden, District Surveyor, Grassendale.
	SANITARY.		
Mar. 1	Middlesbrough—Sanitary Pipes, &c.	Stores Committee	F. Baker, Borough Engineer, Middlesbrough.
„ 2	Chelmsford—Removal of Refuse	Rural District Council	W. Edser, Avenue Chambers, Chelmsford.
„ 4	Chesterton, Cambs—Removal of Refuse	Urban District Council	J. D. Bland, Council Offices, Chesterton.
„ 4	Southwick, Sussex—Sewerage	Urban District Council	G. W. Warr, Council Offices, Albion Street, Southwick.
„ 4	Wicklow—Sewerage Works	Urban District Council	J. Pansing, Church Hill, Wicklow.
„ 4	London, N.—Works and Materials (14 contracts)	Urban District Council	E. J. Lovegrove, Engineer to the Council, Southwood Lane, Highgate.
„ 6	Colchester—Lime	Roads and Drainage Committee	H. Goodyear, Borough Engineer and Surveyor, Colchester.
„ 6	Wortley, Sheffield—Sewers, &c.	Rural District Council	G. E. Beaumont, Engineer to the Council, Grenoside, near Sheffield.
„ 7	Bitterne, Hants—Sewers, &c.	South Stoneham Rural District Council	F. Wentworth-Shields, 1 Cranbury Road, Southampton.
„ 7	Cannock, Staffs—Sewage Works	Urban District Council	C. L. Whitehead, Engineer, Council Offices, Cannock.
„ 9	Failsworth, Lancs—Laying out ground	Urban District Council	C. J. Lomax, 37 Cross Street, Manchester.
„ 9	Hunslet, Leeds—Sewerage Works	Rural District Council	C. H. Marriott, Son and Shaw, Church Street Chambers, Dewsbury.
	TIMBER.		
Mar. 5	Thorpe, Norfolk—Timber, Oil, &c.	County Asylum Committee	G. Smith, Asylum, Thorpe, Norfolk.

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COLLEDGE & BRIDGEN,

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"Reliable" Mortise Locks,

&c., &c., &c.

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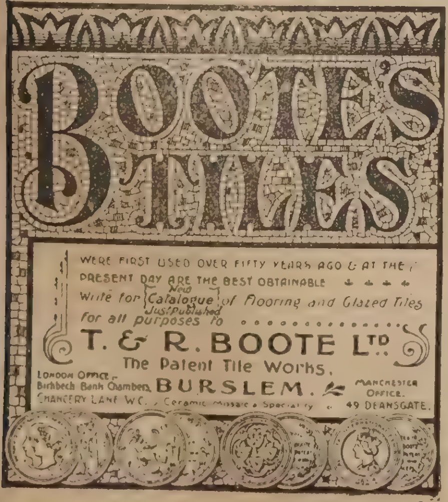

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CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Hay, best	per load	4	0	0	4	7	6
Sainfoin mixture ..	do.	3	10	0	4	10	0
Clover, best	do.	4	5	0	5	0	0
Beans	per qr.	1	10	0	1	10	6
Straw	per load	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.	1	2	2	1	12	8
Colza Oil, English ..	do.	1	6	0	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	1	0	—		
Lead, white, ground, carbonate	do.	1	4	10	—		
Do. red	do.	1	0	4½	—		
Linseed Oil, barrels ..	do.	1	3	9	1	4	0
Petroleum, American ..	per gal.	0	0	6¾	0	0	7
Do. Russian ..	do.	0	0	6¼	0	0	6½
Pitch	per barrel	0	7	6	—		
Shellac, orange	per cwt.	3	1	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	5	6	1	6	0
Tar, Stockholm	per barrel	1	8	0	—		
Turpentine	per cwt.	1	8	10½	1	9	0

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	86	0	0	—		
Iron, Staffs., bar.. ..	do.	7	5	0	9	10	0
Do Galvanised Corrugated sheet ..	do.	11	10	0	—		
Lead, pig, Spanish ..	do.	14	0	0	—		
Do. do. English common brands..	do.	14	17	6	—		
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0	—		
Do. pipe	do.	18	3	0	—		
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do. , floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	10	0	7	0	0
Do. Mild Bars	do.	7	5	0	7	10	0
Tin, Foreign	do.	122	10	0	123	0	0
Do. English ingots ..	do.	126	10	0	—		
Zinc, sheets, Silesian ..	do.	21	0	0	—		
Do. do. Vieille Montaigne	do.	21	12	6	—		
Do. Spelter	do.	17	2	6	—		

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel..	per load	3	0	0	4	0	0
Pine, Quebec Yellow ..	do.	4	7	6	6	0	0
Do. Pitch	do.	2	10	0	3	15	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	0
Do. Petersburg ..	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P. Std.	11	0	0	14	15	0
Do. do. 4th & 3rd	do.	9	15	0	14	0	0
Do. do. unsorted	do.	—			—		
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	15	0	15	5	0
Do. do. 2nd „	do.	8	15	0	14	15	0
Do. do. Unsorted „	do.	5	5	0	13	0	0
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	11	10	0	16	15	0
Do. White Sea ..	do.	10	0	0	14	15	0
Do. Quebec Pine, 1st..	do.	22	0	0	23	0	0
Do. do. 2nd	per P. Std.	19	15	0	—		
Do. do. 3rd &c.	do.	13	10	0	—		
Do. Canadian Spruce, 1st	do.	12	5	0	12	15	0
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	7	15	0	10	10	0
Flooring Boards, 1in. prepared, 1st ..	per square	0	13	6	—		
Do. 2nd ..	do.	0	9	9	0	12	6
Do. 3rd &c. ..	do.	0	9	3	—		

CONTRACTS OPEN.

TO BUILDERS.

The METROPOLITAN ASYLUMS BOARD invite TENDERS for the ERECTION of a SCHOOL at BRENTWOOD, Essex, according to drawings, conditions, and specifications, and Articles of Agreement, which may be seen at the Office of the Architects (Messrs. C. & W. HENMAN), 64 Cannon Street, E.C., between TEN and FIVE on and after WEDNESDAY, the 27th instant.

Bills of quantities, prepared by Mr. BERNARD SWINSTEAD, may be obtained at the Office of the Architects, upon payment of a deposit of £10 in gold or Bank of England notes, which amount will be returned to persons sending in a bonâ-fide Tender.

Tenders, sealed and endorsed "Tender High Wood School," and accompanied by original priced bills of quantities in separate sealed packets, must be sent to The Clerk, Metropolitan Asylums Board, Embankment, E.C., not later than TEN a.m. on WEDNESDAY, MARCH 20th.

The Board do not bind themselves to accept the lowest or any Tender.

By order,
T. DUNCOMBE MANN,
Clerk to the Board.

February 22nd, 1901.

COUNTY BOROUGH OF WEST HAM.

TO CONTRACTORS.

The Council hereby invite TENDERS for the ERECTION of a DYNAMO HOUSE at their Small-pox Hospital, Dagenham, Essex.

Plans and specification may be seen, and form of Tender, bills of quantities, and further particulars obtained at the Borough Engineer's Office, Town Hall, West Ham, E., upon the deposit of One Pound, which will be returned upon the receipt of a bonâ-fide Tender.

Tenders, endorsed "Tender for Dynamo House, Dagenham," to be sent to my Office not later than FOUR o'clock on TUESDAY, 12th MARCH, 1901.

The Council do not bind themselves to accept the lowest or any Tender. The contractor will be required to enter into a bond, with two sureties, for the due performance of the contract, and no work will be ordered under the contract until such bond has been duly executed.

The contractor whose Tender is accepted, and with whom a contract is entered into, will be required to pay to the whole of his workmen such rate of wages, and observe such hours of labour, as are recognised by the workmen's trade unions, and shall not assign, nor under-let, or make a sub-contract with any person or persons for the execution of any part of such work. In the event of any breach of such agreement the Council will enforce the penalty clause in its entirety.

By order of the Council,
FRED. E. HILLEARY,
Town Clerk.

Town Hall,
West Ham, E.,
February 1901.

BOROUGH OF PADDINGTON.

PUBLIC UNDERGROUND CONVENIENCE FOR BOTH SEXES.

TO CONTRACTORS AND BUILDERS.

The Borough Council of this Borough are prepared to receive TENDERS from parties willing to contract for the ERECTION and COMPLETION of a Public UNDERGROUND CONVENIENCE for both sexes at the junction of Edgware Road and Harrow Road, together with the works incidental thereto.

Conditions, specifications, bills of quantities, and plans may be obtained at the Surveyor's Department, Town Hall, Paddington, between the hours of TEN and FOUR (Saturdays, TEN and ONE p.m.) on payment of a deposit of £1 which will be returned on the receipt of a bonâ-fide Tender.

The Tenders must be sent, sealed and endorsed "Tenders for Underground Convenience," and directed to the Town Clerk, Town Hall, Paddington, and left at the Town Hall on or before TWELVE noon on MONDAY, the 4th of MARCH, 1901.

At the same time a £10 Bank of England note (not to be enclosed with the Tender) must be lodged with the Town Clerk as evidence that the Tender is made bonâ fide the same to be returned immediately to parties whose Tenders are rejected, but in the case of the party whose Tender is accepted to be retained until the contract is signed. If the Tender be withdrawn after its acceptance by the Council the deposit will become forfeited.

The party whose Tender may be accepted will be required to provide two sureties for the due performance of the works.

The Council do not bind themselves to accept the lowest or any Tender.

By order,
FRANK DETHRIDGE,
Town Clerk.

Town Hall, Paddington,
London, W.,
February 1901.

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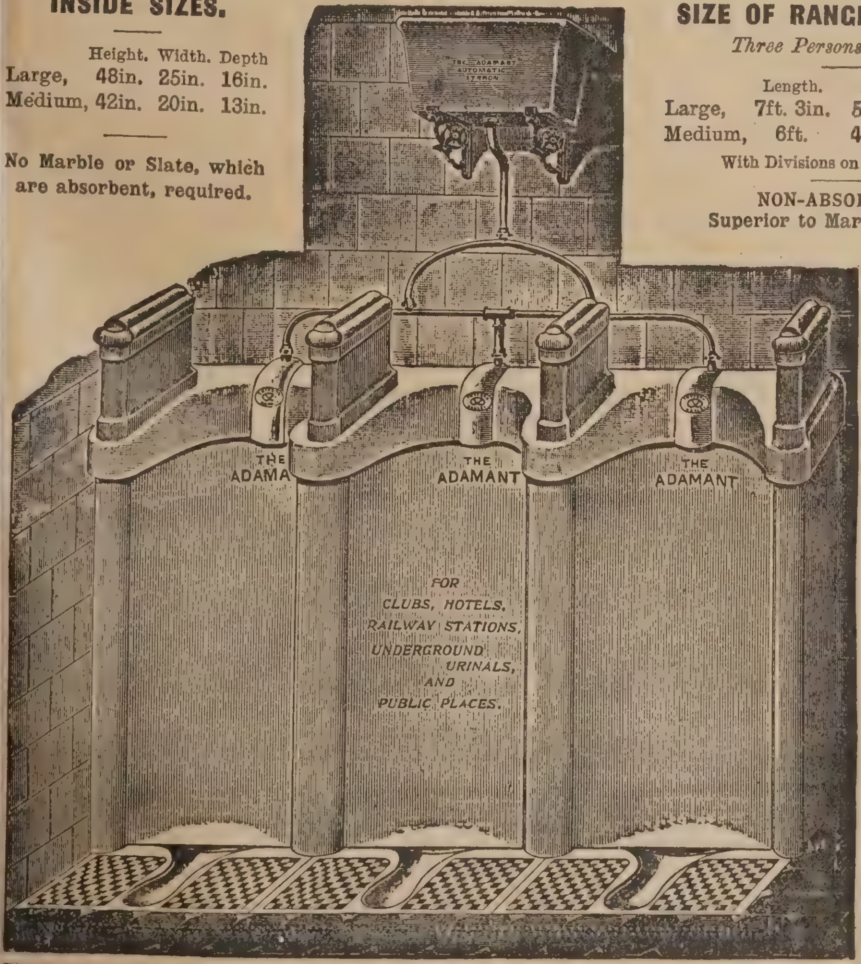
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Keystones.

A Valuable Slate Quarry has been discovered on the Cappard estate, County Galway, on the property of Major Galbraith, J.P. A company is to be formed for the purpose of working it early next year. This will be a great boon to the poor people of the neighbourhood, and will serve as a source of permanent employment for the cottiers, whose life is a struggling existence on the bleak Echtge Hills, which separate that part of the Shannon valley in the County Galway, in the Woodford direction, from the Plain of Aidhus.

A Rhenish Tour.—Last week Mr. Charles Cole gave a lecture to the Devon and Exeter Architectural Society, Mr. C. J. Tait, president, being in the chair. Mr. Cole took his audience from Harwich to the Hook of Holland, thence viâ Rotterdam, Nymingen, and Cranigen—the German frontier station—and so on to Cologne; thence in the Rhine Valley to Remagen. Coblentz and the fortresses of Ehrenheitstein were then dealt with. At Cologne the well-known bridge of boats and Cologne Cathedral were described. The seven mountains, including the far-famed Drackenfel at Königswinter, were next illustrated. A trip up the valley of the Ahr, with sketches of the picturesque Bunte Kuh, and the villages of Ahrweiler, Walpouzheim, Marienthal, Dernan, Rech, Maysshoss to Altenahr, were shown on the screen, and the curious wayside shrines described. Bonn, the birthplace of Beethoven, followed, and views were shown of the house in which the master was born, as well as others of the Münster Church, with the twelfth-century cloisters and the Market Place and Fountain Column, and the Alte Zou. The ancient town of Boppard was pictured next, with its handsome Ptarrkirsche, old Roman arch, and the Carmelite church, in which is a Christian tombstone of the seventh century, and some very fine fifteenth century carved stalls. The little village of Erpel across the Rhine, opposite Remagen, concluded the lecture.

London County Council.—At last week's meeting of the Council the Finance Committee recommended that they be authorised to take the necessary steps to ascertain the views of the Secretary of State for the Home Department on the following proposals:—(*a*) The extension of the sinking fund period for capital money raised for the erection of working-class dwellings; (*b*) the power to reckon the freehold land on which the dwellings are erected as an asset against debt. This was agreed to. Upon the recommendation of the General Purposes Committee it was resolved to appoint a new standing committee for the purpose of considering and reporting upon questions relating to historic buildings in London and of dealing with the preservation and publication of the historical records of the Council, the administration of the library, and other cognate matters. The Building Act Committee reported that they had received a letter from his Majesty's Office of Works with reference to the new offices for the Land Registry, Lincoln's Inn Fields, promising that the building line of the square should be, if possible, adhered to. This is very satisfactory from the public point of view, especially having regard to the exemption of Government buildings from the provisions of the London Building Act, 1894, and to the fact that it is not proposed to rebuild on the site of the existing one-storey buildings at the south-east corner of the Fields.

New Companies.

Non-injurious White Paint Syndicate, Limited.
Registered January 21st. Capital £4,000 in £1 shares.

Warwickshire Coal Company, Limited.

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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the Work.

ABERDEEG, Mon.—For the erection of school at Warm Turn, near Aberdeeg, Mon. Mr. R. L. Roberts, Abercarn, architect:—

E. R. Evans & Co., Cardiff	£6,653	2	3
A. G. Howel, Cardiff	6,570	0	0
C. H. Reed, Newport	6,500	0	0
J. Morgan, Blaenavon	6,087	0	0
D. Lewis, Llanhilleth, Aberbeeg	5,979	0	0
A. P. Williams,* Abertillery	5,869	0	0
N. Bagley & Co., Abertillery	5,807	12	0
W. E. Willis, Ystrad	5,777	0	0
Gaen Bros., Abertillery	5,709	0	0
D. Thomas & Son, Cardiff	5,698	0	0
J. Jenkins, Newport	5,535	0	0
W. Britten, Barry Dock	5,270	0	0

* Accepted.

BRANKSOME.—For making new roads and sewers on the Branksome Estate, for the Trustees of the late George Durrant, Esq. Messrs. Hankinson & Son, Richmond Chambers, Bournemouth, surveyors:—

M. Loader, Bournemouth	£2,640	2	11
G. T. Budden, Parkstone	2,224	13	4
H. C. Brixey, Parkstone	2,211	19	6
Grounds & Newton,* Bournemouth	1,976	12	6

* Accepted.

BROMLEY, Middlesex.—For sundry work in connection with the installation of electric light at the Poplar and Stepney Sick Asylum:—

C. Cooper & Co.	£4,075	0	0
Speedy, Enon & Co.	3,498	10	0
G. Weston & Co.	3,488	0	0
J. C. Christie	3,345	0	0
F. A. Glover & Co.	3,262	0	0
Strode & Co.	3,193	0	0
J. Bolding & Sons, Limited	2,899	15	0
R. Dawson & Co., Limited	2,876	0	0
V. E. Middleton	2,784	10	0
J. J. Roche & Co.	2,596	0	0
Frigell Bros. & Louis	2,550	0	0
National Wiring Company	2,540	0	0
H. F. Joel & Co. and T. Potter & Sons, United	2,439	0	0
Young & Marten, Limited	2,359	0	0
C. Peacock & Co.*	2,039	0	0
Whittaker Bros., Limited	1,756	19	6

* Accepted.

DEVONPORT.—For the erection of St. Budeaux Board School for the Devonport School Board. Messrs. Hine & Odgers, architects:—

Berry	£19,555	Coles	£15,878
Goad	17,850	Andrews	15,850
Blackell	17,711	Matcham & Co.	15,673
Roach & Lovell	17,350	Wakeham	15,138
Carter	16,681	Lethbridge	14,980
Skinner	16,349	Allen & Tozer	14,951
Paynter	16,250	Lapthorn & Co.	14,666
Trevena	16,100	Blake	13,900
May	16,055		

DURHAM.—For the construction of 1,720 lineal yds. of 9in. pipe sewers, with manholes, ventilation shafts and a flushing chamber in connection therewith, the construction of a screening chamber, and the laying-out and fencing of three acres of land for sewage irrigation at Aldin Grange in the parish of Broom, for the Durham Rural District Council. Mr. George Gregson, surveyor:—

G. T. Manners, Durham	£1,776	0	0
P. Frater, Howden-le-Wear	1,696	0	0
R. Oliver, Gilesgate Moor	1,550	0	0
T. Skelton, Durham	1,544	7	11
J. G. Bradley, Durham	1,496	19	6
J. Carrick,* Durham	1,493	1	3
W. Garnet, South Moor	1,453	5	0

* Accepted. [Surveyor's estimate, £1,564.]

DURHAM.—For erection of pumping station at sewage, disposal works, for the Durham Corporation. Mr. Harry W. Taylor, A.M.I.C.E., engineer:—

J. Miller, North Shields	£1,565	0	0
Gardon & Son, Durham	1,398	0	0
C. W. Gibson,* Durham	1,297	10	0

[Engineer's estimate, £1,500.] * Accepted.

HURSTPIERPOINT, Sussex.—For the erection of the isolation hospital, Hurstpierpoint, for the Cuckfield Rural District Council:—

J. Brown, Horley	£12,100
Ockenden & Son, Crawley	11,602
Thomas & Edge, Woolwich	11,577
Longley, Crawley	10,949
Johnson & Co., Wandsworth	10,877
Peerless, Dennis & Co., Eastbourne	10,370
Foster Bros., Norwood	10,293
R. Cook & Sons, Crawley	10,284
Rowland Bros., Horsham	10,279
Potter Bros., Horsham	10,000
Tonge, Watford	9,898
S. Knight, Cuckfield	9,802
Wallis, Balham	9,741
Field & Co., Brighton	9,570
Norman & Burt,* Burgess Hill	9,399

* Accepted.

LONDON.—For the erection of the "Perseverance," East Ham, E. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, London, E C. Quantities supplied:—

F. & T. Thorne	£4,350	Courtney & Fairbairn	£4,053
G. E. Todd & Co.	4,270	Sheffield Bros.*	3,925
C. Dearing & Son	4,205		

* Accepted.

NOTTINGHAM.—For erection of a car-shed and offices in Piccadilly, off Highbury Road, Bulwell, for the Tramways Committee. Mr. Arthur Brown, M I.C.E., city engineer:—

W. Crane, Ltd.	£10,250	J. H. Williamson, Ltd.	£9,100
J. Hutchinson	9,905	J. Lewin, Netherfield	9,070
F. Messom	9,889	H. Vickers	8,960
A. G. Bell	9,671	T. Cuthbert	8,888
J. G. Thomas	9,400	Dennett & Ingle,* Station Street	8,750
W. Maule	9,300		
J. H, Vickers, Ltd.	9,174		

* Accepted.

[Rest of Nottingham.]

POOLE.—For the erection of car-shed, 580 super yds., repair shops, 170 super yds., brick-walls, steel and slate roofs; general offices, 100 super yds, brick walls, slate roofs, lavatories, outbuildings, pits, boundary walls, &c., at Poole, for the British Electric Traction Company:—

Jones & Seward, 97 Poole Road, Bournemouth	£2,724
Jenkins & Sons, 43 Holdenhurst Road, Bournemouth	2,655
Burt & Vick,* Buffalo Works, Poole	2,142

* Accepted.

WELLINGTON.—For business premises for Mr. H. Shepard. Messrs. Dalgleish and Dickens Lewis, architects. Quantities by the architects:—

R. & J. Millington, Oakengates	£1,950	0	0
John Carver, Wellington	1,898	18	0
R. Price & Sons, Shrewsbury	1,880	0	0
A. Roper,* Wellington	1,789	0	0

* Accepted.

WEST CROYDON.—For painting, &c., to Spurgeon's Tabernacle, West Croydon. Messrs. Chas. Bell, Withers & Meredith, architects, 3 Salters Hall Court, Cannon Street, E.C.:—

F. R. Docking	£134	7	D. Waller*	£127	9

* Accepted.

WHITBY.—For the erection of an electric light station, for the Whitby Urban District Council:—

F. G. Minter, Ferry Works, Page Street, Westminster	£6,664	0	0
J. Jaram & Sons, Gladstone St., Scarborough	6,379	10	0
J. F. Wilson, Scarborough	6,252	1	6
Parker & Sharp, York	5,508	15	2
A. Palframan, Prospect House, Chubb Hill Road, Whitby	4,648	14	0

* Accepted.

COMING EVENTS.

Wednesday, February 27.

Edinburgh Architectural Society.—Mr. Percy E. Nobbs, M.A., on "Why we go to Italy," 8 p.m.

Society of Arts.—Dr. W. Schlich, C.I.E., on "The Outlook for the World's Timber Supply," 8 p.m.

Northern Architectural Association.—Mr. Algernon Barker, B.A., on "Legal Topics of Interest to Architects and Surveyors," 7 30 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. Henry R. Kenwood, M.B., D P.H., on "Methods of Disinfection," 7 p.m. Inspection and Demonstration at Common Lodging House, at 3 p.m.

Institution of Civil Engineers.—Students' visit to the Electrical Works of the London United Tramways, Limited, 88 High Road, Chiswick, 2.30 p.m.

Thursday, February 28.

Royal Institution.—Professor Percy Gardner, Litt.D., F.S.A., on "Greek and Roman Portrait Sculpture," I., 3 p.m.

Carpenters' Hall, London Wall.—Mr. H. C. Richards, K C., M.P., on "Old London," 8 p.m.

Society for the Encouragement of the Fine Arts.—Mr. F. H. Evans on "Architectural Details from Southwell Minster."

Institution of Electrical Engineers.—Meeting at 8 p.m.

Society of Antiquaries of London.—Meeting at 8.30 p.m.

Friday, March 1.

Architectural Association.—Mr. E. W. M. Wonnacott on "The Paris Exhibition," 7.30 p.m.

Royal Institution.—Mr. H. Hardinge-Cunynghame on "Enamels," 9 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. Henry R. Kenwood, M.B., D.P.H., on "Water, Composition, Pollution, and Purification." 7 p.m.

Institution of Junior Engineers.—Mr. A. Woodroffe Manton, M.I.C.E., on "Shield-Driven Tunnelling," 8 p.m.

Saturday, March 2.

Sanitary Inspectors' Association.—Paper to be read at 6 p.m.

Architectural Association.—Second Spring Visit to the Royal School of Art Needlework, Prince's Gate, S.W., by permission of the Architect, Mr. F. B. Wade, 3 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I. Inspection and Demonstration at Islington Disinfecting Station, at 3 p.m., conducted by Mr. A. E. Harris, L.R.C.P., M.H.

British Institute of Certified Carpenters (Carpenters' Hall).—Mr. W. H. Betambeau on "Wood Beams: their Properties and Design," 6 p.m.

Monday, March 4.

Royal Institute of British Architects.—Business meeting; election of Royal Gold Medallist, 8 p.m.

Surveyors' Institution.—Annual Dinner at the King's Hall, Holborn Restaurant, at 6.30 p.m.

Liverpool Architectural Society.—Professor Beresford Pite on "The Architectural Treatment of Stonework," 6 p.m.

Leeds and Yorkshire Architectural Society.—Mr. Geoffrey Lucas on "Logical Building and its Influence on Design," 6.30 p.m.

Society of Engineers.—Meeting at 7.30 p.m.

Victoria Institute, 8 Adelphi Terrace, W.C.—Rev. G. E. White on "A Visit to the Hittite Cities Eyuk and Boghas," 4 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. Henry R. Kenwood, M.B., D.P.H., on "Elementary Statistics," 7 p.m.

Tuesday, March 5.

Cardiff, South Wales and Monmouthshire Architects' Society.—Mr. J. H. Phillips on "Holidays on the Continent."

Glasgow Architectural Association.—Paper by Mr. George S. Hill, A.R I.B.A.

Architectural Association of Ireland.—Mr. John Good on "Some Aspects of the Labour Question as Applied to the Building Industry," 7.45 p.m.

Society of Arts (Applied Art Section).—Mr. Richard Steele on "Early Playing Cards and their Decoration," 8 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. J. Wright Clarke on "Details of Plumbers' Work," 7 p.m.

Wednesday, March 6.

Geological Society of London.—Meeting at 8 p.m.

Northern Architectural Association.—Students' Evening and Council Meeting.

Ruskin Society of Birmingham.—Mr. Richard Whiteing on "Ruskin's Moral Ideas in History," 8 p.m.

British Archæological Association.—Meeting at 8 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration at Soap Works at 3 p.m.

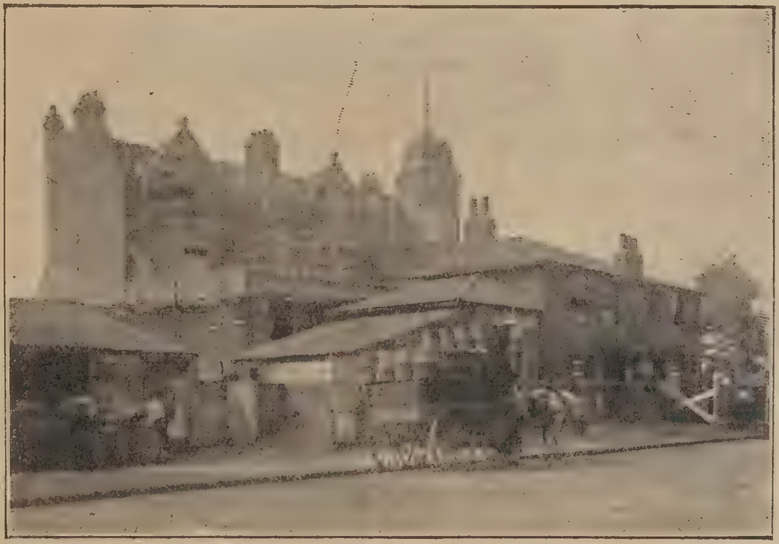
THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

MARCH 6, 1901.
No. CCCXVII.

EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

An Architectural Causerie.

The New Chiswick. THE Four Miles Radius was long an insuperable barrier to the adequate extension of suburban London. Beyond the charmed circle of that number of miles from Charing Cross, where the roaring tide of London's life flows most strongly, one was plunged instantly into the provinces. The change was effected as though by the wand of the pantomime fairy. On the hither side of the fateful lamp-post one could claim to belong to the great world of the Metropolis, of politics, of fashion; on the outer side, one was a dweller in Suburbia. The matter of a single stride, the thickness of a party-wall, sufficed to effect this psychological change, and at the same time as it deprived one of self-respect and that of those who were fortunate enough to live nearer the hub of the universe by six inches or so, it sent up the prices of everything from a cab-fare to a cauliflower by at least fifty per cent. The Radius is now deprived of its terrors, for of late years tramways and other methods of communication have effected a change, and although the cabman still charges excruciating fares beyond the four-mile limit when he gets the chance, that chance but rarely comes to him now. With recent years, too, has come the building of flats in districts far beyond the radius—a thing thought impossible not so long ago, when it was an article of belief among builders and property owners that flats could not be made to pay at these distances. Peculiarly interesting in this connection is the growth of London along that western exit from it known as the Bath Road. Within the unstrained memory of the youngest of us, King Street, Hammersmith, was no sooner left behind than a modified rurality was reached at that part of the Bath Road which was, and is still, locally known as the Chiswick High Road. Chiswick never did lie upon this main artery, but may be sought, even yet very much of an old-world village, lying on the foreshore of the Thames, down a turning to the left. Turnham Green, on the main road, in the parish of Chiswick, has seen all the recent building, and by many of its residents who have a nice taste in addresses is dignified as Chiswick. Recent building operations here have disposed of the very last of the old market-gardens and fruitful orchards that bordered the way. The cause of this sudden development may be sought, firstly, in the all-night service of trams started two years ago, and secondly in the recent reconstruction of this line of the London United Tramways, which will give a service of electric trams from Hammersmith Broadway not only to Kew Bridge, but beyond that, through Brentford, to the very western end of Hounslow itself. The value of land has gone up immensely in this district in consequence of the cheaper and speedier communications thus ensured. A sign of the times here is the proximate completion of an extensive block of flats at Hamlet Gardens, on the site of Hamlet House, a deserted old mansion standing until quite recently in large grounds which could neither be let nor sold for a period of about twenty years past, during all which time a succession of the usual house and estate agents' huge black notice-boards appeared and flourished awhile and rotted away. We grew up from boyhood to maturity in this while, and thought to find the play outlast our time and the place at last gather such myths and eerie legends as most do affect such derelict old mansions. But one day the last of the boards disappeared; the enclosing high brick wall came down, the trees followed, and after that the house itself; and now, behold, flats apoplectically red, towering to the skies! Across the road, too, a little to the westward, there stood, until recently, an old roadside inn that knew the time when not a house save farmsteads (and of those but one or two) were in sight. An ugly, old, but not ancient, inn; a typical beerhouse, this "Coach and Horses," where the waggoners, jogging their three-miles-an-hour gait between the Middlesex market gardens and Covent Garden Market halted to refresh on beer and bread and cheese. Such a market waggon you actually see in the accompanying photograph of the house—a view taken the very day before the last of it was demolished to give place to the gorgeous red-brick and terra-cotta modern "Coach and Horses" seen rising behind. The view is interesting—nay, unique, for it shows us at one glance what old and new in this order of things are like. No longer will the waggoners halt their weary teams here, for the customers of the new house will be the residents of the new streets of villas that are springing up on the cabbage fields round the corner; and the two classes of trade—we have it on authority—do not mix. This, then, is the last of that old Chiswick which bordered the highway, and the disappearance of rurality so far as Kew and Brentford.



THE COACH AND HORSES, CHISWICK ROAD.

Our Squares. IT is only in very recent times that we have learnt to appreciate our squares. As London spreads no new ones are laid out; the appellation "Gardens" is freely applied where no gardens exist, whilst in blocks of "Mansions" all idea of square or garden is frankly abandoned. The historian of London at some future day will marvel at the culpable neglect of the people of the greatest city in the world who could thus allow vast neighbourhoods to spring up without the air, light and greenery of the older system. It is rare in English society to hear architecture mentioned: the rising middle class looks upon one square as fashionable and another as vulgar for social reasons alone without reference to taste, and the masses care for none of these things. Next to her parks and her river, her squares should be London's most cherished possession. Think of the number and extent of them; add up their acreage and see what "lungs" they are to the town, what a refreshment to the eye, what a comfort to the mind after the crowded streets; surely they merit the attention of all who are interested in the imperial city. The long succession of squares beginning near Gray's Inn Road and ending at Bayswater was commenced in the last century. Built of brick, comfortable, homely, seldom ill-proportioned, they are representative of the middle class—but they are destitute of fine buildings, striking effects, or picturesque designs. The familiar London brickwork has changed with time from staring yellow to dingy brown and grimy black; the slight relief given by small Palladian details has shared the same fate; monotony is a fault common to them all. Nearer our own time the brick fronts gave place to stucco in one uniform tint; the effect was to intensify the monotony, but when varied with tasteful colours, as was done more recently still, the results were very satisfactory. On the whole, however, our squares exhibit a remarkable want of public spirit and of artistic taste; a committee in each square charged to negotiate with the ground landlord and supervise all questions of taste and decoration would have been, nay would even now be, quite feasible, and greatly add to the amenities of London. A still greater change is the re-introduction of red brick as a building material; greater still is the revival of gables and fanciful roof treatment; greatest of all the increased height of modern buildings. The new style has burst upon quiet neighbourhoods in Bloomsbury and Marylebone with a most disturbing effect, and one of the new designs is enough to break the architectural peace of a whole square. It remains to be seen if the artistic effect will be satisfactory; at present we live in a state of change, but the danger of architectural failure must always be present if there be no "courtesy of architecture," no consideration for neighbouring designs, no restraint in height, material, or colour. If our squares are in danger of passing from the extreme of placid monotony in design to that of florid restlessness—not even St. James's Square or Hanover Square being spared—one feature at least remains sacred: the garden. No city can boast of such trees within its bounds, and the plane, it is well known, takes kindly to London; those in Berkeley Square are the most celebrated, but there are many more. Beautiful and restful as they are, the gardens exhibit the same monotony of treatment as the houses; one type prevails throughout, and the details, such as ironwork, gates, and the like, are usually poor; they seem to have been made by the mile. It is much to be regretted that no attempt has been made at formal or Italian gardening; that no central feature, no group of sculpture, no fountain, is found in them. There is a rather forlorn statue of one of the Dukes of Bedford somewhere in Bloomsbury, and others may be found by the diligent explorer, but the combination of the natural and the artificial, so common and so delightful a feature of Italian cities, is little understood in London.

THE SARACENIC ARCHITECTURE OF CAIRO.*

BY RONALD P. JONES, B.A.

IN the general group of Mahomedan styles, extending from India to the South of Spain, the Saracenic architecture of Egypt is in many respects the most important. Cairo, though not the residence of the Caliph, was, during the career of the Muslims in the Middle Ages, the centre of artistic development, and can show a series of mosques and monuments unequalled in number or beauty by those of any other city.

Again, the Cairene work may be considered the normal type: purer and more restrained than that of the other branches, and less affected by previous work at home or contemporary styles developing abroad. Cairo in itself has the additional advantage of including within its boundaries practically all the Saracenic architecture which still survives in Egypt, extending from the middle of the seventh century down to the end of the sixteenth, when it may be said to terminate altogether. As with mediæval Gothic, the finest work was produced in the thirteenth and fourteenth centuries.

The Arabs, on their conquest of Egypt, brought with them no style of their own to impose on the subject nation, and that which they found existing was a Coptic Christian copy of the Byzantine, borrowing largely, like its model, from the Roman remains. In detail, however, there was a certain amount of original work, such as carving, which followed the Byzantine method of drilling to obtain depth of shadow, and using the characteristic acanthus leaf with sharp points.

The first mosques were probably adapted from Christian basilicas, and in any case were designed by Coptic architects, so that more than two centuries elapsed before the Saracens freed their work entirely from Byzantine influence.

On the other hand, the ancient Egyptian architecture and its Græco-Roman revival, which had ceased with the introduction of Christianity, can hardly be said to have influenced the Mahomedans at all; and this is not surprising, for the sacred buildings of the two periods were so entirely different in form and character that it would not be easy to find any two types belonging to the same country which have so little in common; even this is due rather to climatic conditions than to any real connection between the styles.

The Egyptian temple, a threatening and impenetrable mass of wall and pylon, full of dark mysterious chambers accessible only to a chosen priesthood, built for eternity of the most durable materials in enormous masses, was not so much a house of prayer for the nation as a fortress within which the truth was jealously kept from common knowledge: while the Saracenic mosque was open in every part to the light of day, and free to all comers; constructed no more solidly than was necessary for the provision of shade and seclusion, a picturesque group of open courts and cool recesses, fantastic minarets and airy domes, all arranged with playful disregard for symmetry or dignity and decorated with a fascinating, if superficial, system of colour and mosaic, which told no mysterious and awe-inspiring story, but simply gave here and there patches of rich colour, charming to the eye and perfectly in harmony with the true character of the building itself.

To turn to some of the general features and influences of the style, first and foremost comes the climate. Cairo is practically rainless: not that it never rains at all, as in upper Egypt, but the rain is not frequent or continuous enough to be of importance; while the perfect dryness of the air and almost perpetual sunshine are certainly unknown in any other country which has developed a style of its own. The effect is felt in all branches of construction and decoration. In the first place the necessity for a roof as a protection from rain and bad weather hardly exists; but on the other hand protection from the sun is all important: there is hardly any part of a mosque which would not be devastated by a northern winter storm, and the most delicate woodwork and stucco relief is entirely exposed to the open air. The roof is flat and invisible from the ground externally, and it needs no gables, gutters, or gargoyles, or any of those expedients which the northern architect turns to such good account. The domes are reduced to incredibly thin shells of masonry which have no greater weight to bear than that of their own materials: carved and modelled work, so long as it was out of reach of human destruction, might be carried to extremes of fragility, and at first ornament which would naturally be carved in stone was executed in plaster.

The extraordinary brilliance of the sunlight led to the use of low relief, the depth of which hardly varies, whatever the material employed; while the sharp contrast of light and shade rendered undercutting unnecessary and delicate half-tones impossible. Colour abounds everywhere; not only the artificial colouring found in ancient work, but that of natural materials, which is one of the finest features of the style, and has been once for all described in a celebrated passage of the "Stones of Venice."

With regard to religious requirements, a mosque is not a church at all in the Western sense; it is merely an enclosure where the individual worshipper may find rest and shade. The simple services which take place only require a pulpit and a reading desk, while a niche in the wall shows the direction of Mecca, and a fountain in the court supplies water for the preliminary ablutions. There is no special sanctuary reserved for the priesthood, no music or singing, and no ritual of processions or sacrifices; consequently the furniture of a mosque is trifling compared with that of a cathedral, and its form once fixed remains permanent all through the life of the style.

An important religious point, however, exercised immense influence over the decorative arts—representation of man and animals in sculpture or painting was absolutely prohibited; and this commandment at one blow debarred the Saracenic artists from the widest field for their talents. They had to take refuge in abstract lines and curves; the more so since Egypt is almost entirely destitute of natural foliage which might have served as a model; As a result they produced a most ingenious and complicated system of interwoven lines, radiating and returning, which may be uninteresting compared with the sculpture of the West, but is suitable for the use of coloured materials and possesses a distinct charm of its own.

This geometrical system was applied to all materials indiscriminately, from stonework to carpets; though exceptions occur, such as friezes, where the running scroll with conventional leaves is found, often serving as a background for texts from the Koran, which in the beautiful Cufic or Arabic lettering are extremely effective.

The materials may next be shortly described, beginning with stone, which does not appear to have come into use for construction till the beginning of the fourteenth century; after that time most use was made of limestone, of which there is an inexhaustible supply in the hills to the east of Cairo, while the Pyramids themselves were even more convenient as a quarry, since the blocks of stone were there ready cut and only needed reducing to a manageable size and transporting across the Nile.

Granite is hardly ever found except in the form of old fragments, such as lintels from the temples, used as threshold stones for the inner courtyard of the mosque, and in many cases still showing their original hieroglyphics.

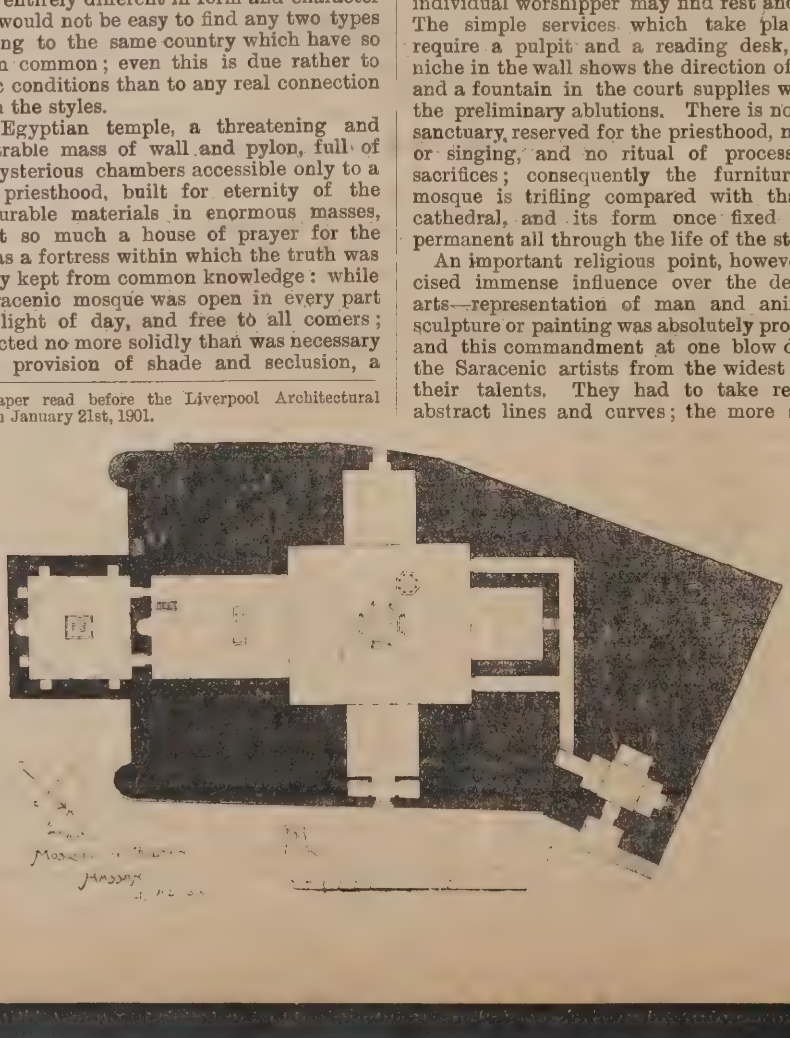
Marble as a constructional material is equally rare, and consists of columns borrowed from small Greek and Roman buildings, and used for the arcades in the early period of the style. But the supply seems to have given out very soon and did not lead to the formation of any Saracenic order, since the architects afterwards took to setting their arches on square piers. On the other hand, as a veneer marble is very important in all periods; whether cut in large slabs for dados, inlaid in pavements, or combined with other precious materials in mosaic, it is the chief decorative factor of the style and contributes a great deal of that natural colouring which is one of its best features.

A few varieties were quarried in the country, such as red porphyry, black diorite and greenstone; but all the rest were obtained from the Roman work at Alexandria, or from the Coptic churches, which in their turn had imported them from Greece, Italy and the whole civilised world.

The Saracenic brickwork resembles the Roman, from which it was no doubt copied, in the use of bricks not more than 2in. thick with very wide mortar joints. Like Roman work, too, it was never meant to be visible, but always covered with plaster, laid on in several coats of some thickness, and if decoratively treated, modelled by hand while still damp; this method of treating the stucco gives it the proper freedom of line and artistic effect which is not to be found in the mechanical moulded work of the south of Spain.

The Cairo mosques contain a remarkable amount of woodwork, considering that Egypt grew no trees at all except the palm, which seldom attained a size large enough for roofing beams; practically all timber had to be imported—sycamore and cedar from Syria, and pitch pine from Asia Minor, these being the varieties mainly used.

Again, the effect of the climate on large carpentry was bad; certainly there was no fear of damp and its consequences, but the fierce dry heat sooner or later warped the wood and made it brittle. The only remedy for this was to adopt a system of minute subdivision into panels so that the shrinkage in each particular piece should not affect the whole too seriously. The system was not very practicable in the case of roofs of some span except as coffering, which is sometimes found; consequently most of the original roofs have long ago collapsed. But with joinery and cabinet work it was carried out most thoroughly, and it is curious to note that the necessities of the climate pointed to exactly the same method of treating woodwork as did the Saracenic scheme of decoration imposed by a religious prohibition. Variety of colouring could be obtained by the use of cedar, sycamore and ebony, which were often combined with small plaques of ivory and mother-of-pearl.



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* A paper read before the Liverpool Architectural Society on January 21st, 1901.

Leaving glass to be considered with windows, the other minor materials are chiefly decorative, such as tiles, enamel, and tortoise-shell, used with marble for mosaics. Bronze and iron are the only metals which commonly occur, being used for overlaying doors, when they are themselves sometimes inlaid with discs of silver embossed in relief.

In respect to plan and general proportions, the mosques fall into two main classes—that of the square cloistered court, and that of the cruciform building with an open court in the centre. Some examples of a third type are found following the Byzantine model with a central dome; but they are not important enough to be regarded as anything more than exceptions.

The original mosque of Mahomet at Mecca consisted of a simple enclosure of brick partly roofed with beams supported on wooden columns, and up to the thirteenth century the cloistered mosque derived from it continues to be the only type. Round three sides of the courtyard ran a single or double arcade, while on the east side (in reality south-east, the direction of Mecca from Cairo) the number was increased to five or six, in order to provide more shade where the congregation gathered.

In the earliest examples the arcades run north and south on all sides, so that in the east and west walks the arches are transverse; but this arrangement was soon given up in favour of the other and more usual plan.

The general proportions were low, since the court was of great size and the arcades had to be kept down to obtain as much shade as possible throughout the day; consequently the exterior elevation was barely higher than the adjoining houses and was treated simply as a blank wall, with the exception of the entrance, which was always a prominent feature in the mosque.

The second type prevailed during the period of the best work, and is much more compact and effective considered as a whole. The central court is smaller on plan and of nearly cubical dimensions, and from each side there extend arched openings, that in the eastern wall being the largest, as containing the niche and pulpit; but the plan is so far cruciform and symmetrical. The proportions of height to width were much more equal than in the earlier class, and the exterior called for more careful treatment. Unfortunately the good effect of the plan was entirely lost externally, owing to the habit of filling in the angles with small passages, staircases and rooms in several storeys, which had no particular object and brought the exterior elevation to that of a simple rectangle, the walls of which are pierced with tiers of small windows arranged without regularity and giving no indications of the interior arrangements. The cruciform mosque has therefore none of that close and logical connection between interior and exterior which is characteristic of the best Gothic work; and considered architecturally it suffers accordingly.

At the same time it must be admitted that symmetry and dignity were not the aims of the Saracenic architects, who possibly preferred that their buildings, which were usually of small size, should attract by picturesque and informal grouping of the various parts; and this was the more desirable since the principal feature of the style—the dome—could not be made to form the central point of a symmetrical group.

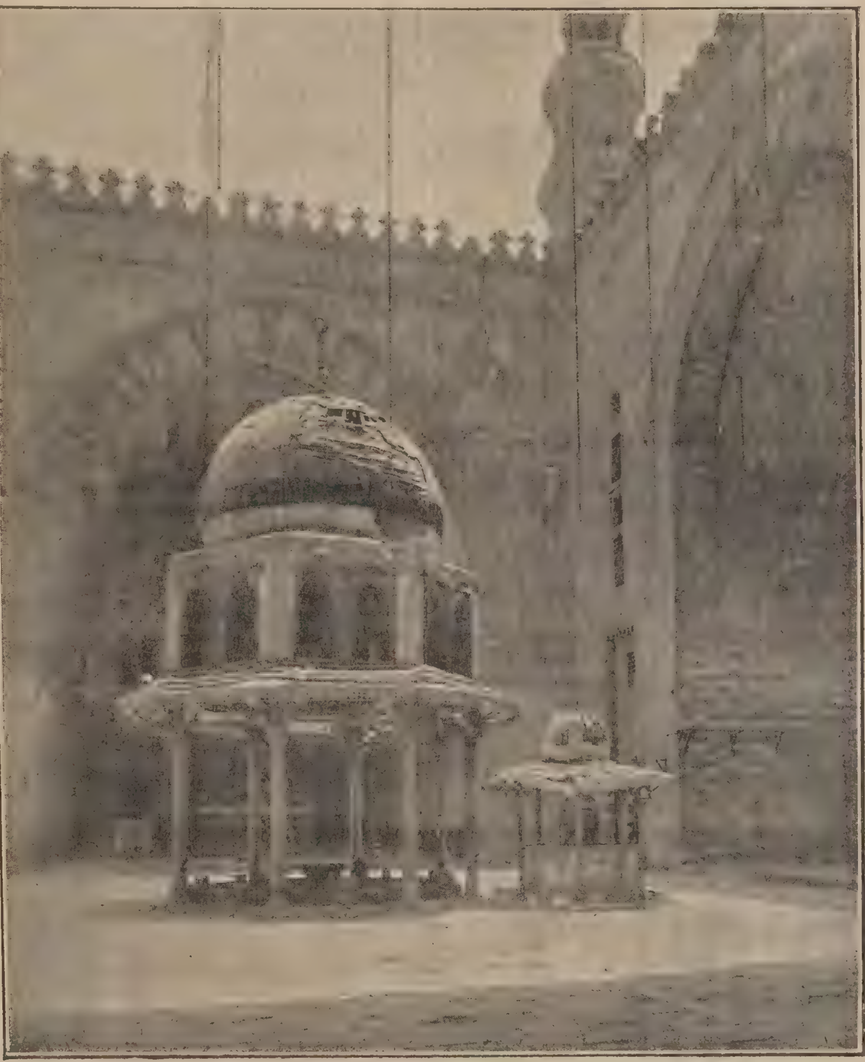
The dome, in itself, has no connection with the mosque, as it is only used to cover the tomb-chapel, or mausoleum of the founder: many of the early mosques have no dome at all, and its presence in later times is only due to the custom which came in that each building should have some member of the founder's family buried by it.

Not only was the dome cut off from the mosque itself, but the tomb-chapel was not generally placed on the centre line, but in some convenient position on one side of the eastern arm; which necessarily gave the exterior a lop-sided appearance.

Other opportunities for effect were lost by the fact that the interior of the dome was only visible from the chapel directly below it, and the proportion of height to width was sometimes more than three to one—much too great for comfort or good effect.

The minarets on their part did not help matters externally. Each mosque had one or two, the position of which was undecided; they might be at any angle and need not necessarily be on the building at all, since a pair of them belonging to one of the late cloistered mosques are placed over a large gate in the city wall, which happens to be near at hand. The main entrance again is found at any odd corner, and never by any chance in the centre of the western side.

The constructional details of the two types may be considered together since they only vary in so far as different materials were in common use at different periods. In the absence of a complete Saracenic order the arch is the feature which first claims attention; the original form was naturally semicircular, since the Romans and Copts used no other.



MOSQUE OF SULTAN HASSAN, CAIRO: INTERIOR.

But as early as the ninth century a very beautiful form of pointed arch was introduced, which consequently antedates by about three centuries the first of its kind in Europe. The Mahomedan architects, unlike their European rivals, do not seem to have been driven to the pointed form by any necessity of construction; it can only be supposed that they knew of both kinds, and preferred the pointed from a decorative standpoint.

In the early examples the arch is somewhat obtuse and has a slight return at the springing, giving an indication of the horseshoe form which afterwards became much exaggerated in other countries. The typical Saracenic arch is the stilted equilateral or four-centred, as the pure Gothic form with centres on the springing-line is not common. Small arches sometimes have trefoil heads, or are otherwise decoratively treated.

In one point all these arches differ from those of the western mediæval work: the voussoirs are invariably square in section, with a flat soffit: mouldings on them are entirely unknown. During the Crusades, the Arabs became familiar with the forms of European architecture prevalent at the time, but for several reasons they kept to their square section. In the first place mouldings were out of place in a country of brilliant, almost harsh, light and shade. Secondly, the square pier which at an early date replaced the circular column did not lend itself to an arch section of curved form. Having decided to reject the moulding system, which emphasised the continuity of the curve, the Saracens took the opposite course of laying stress upon the division into voussoirs by painting every alternate one red. This custom, in its turn, compelled the use of a keystone, in order to obtain symmetry in the colour decoration; and here again the Arabs differ from the Europeans, who always regarded the pointed arch as two segments meeting at the apex without a keystone. In fact, it is interesting to notice in how many respects the Cairene and Gothic arches contradict each other.

That which is commonly spoken of as a Saracenic arch—the true horseshoe form—is not often found in Cairo, as before noted, except in small buildings, where it is inoffensive, though naturally always bad constructively, since the returning segments at the springing are useless and have to be supported by a useless projection in the pier below.

The early arcades, as in Byzantine work, were supported on columns, invariably borrowed from older buildings and roughly brought to the right length, sometimes by the addition of an inverted capital used as a base; dosserets were used over the capital, and also wooden tie-beams, the purpose of which does not seem to have been really understood, as they are often used in parts of an arcade where there is no outward thrust not counteracted by the adjoining arches. The first original form of pier to be evolved was one of square plan, with attached shafts in the angles, of the same material as the pier itself, namely, plastered brick. But this was only a transition to the plain square, which in time became as universal as the corresponding arch.

There is no very marked division between the pier and its arch, like the Gothic capital; but occasionally a band of carving or stucco relief is carried round under the springing.

With regard to vaults, the Saracens were familiar with all forms of barrel vaulting; the first cloistered mosques had flat wooden ceilings, which are always unsatisfactory in appearance, since there is no masonry connecting the parallel arcades, as there are no transverse arches.

Vaulting, however, soon came into use for passages, where it is usually of pointed section, and may be of plastered brickwork or carefully-jointed masonry; as the style developed very large spaces came to be covered by this pointed barrel vaulting. Domical vaulting, as might be expected, is very common, and takes the place of the Gothic intersecting vault. The finest examples are to be found in the two city gates, which are in the shape of low square towers covered by what is practically the original type of dome on pendentives, slightly flattened in section. The normal Saracenic dome of the best period invariably has a drum of some height, and in section appears to be a stilted three-centred arch of a shape which is not found in the West. It consists of a single shell of very thin masonry or brickwork without a lantern at the apex, and the drum is pierced with a ring of small windows with semicircular or pointed heads.

The brick domes are constructed in horizontal rings, overhanging as they rise, till they meet at the apex. They are plastered inside and out, in the latter case fluted or otherwise treated in relief. But in the later centuries they were of cut stone, with radiating joints in the true arch form, and their outer surface is enriched with fluting or carved geometrical patterns. The wonderful elaboration of these designs and the ingenious way in which they are adapted to a surface of peculiar form make these domes one of the most beautiful features of the style, though it is curious that they are not coloured in any way, and show no signs of having been so treated. Being only possible in a very dry climate, they derive additional interest from the fact that they are practically unique. The pendentive is a very important member of the style, as it occurs not only under domes, but for the purpose of filling up angles in various other positions. It is constructed like the Byzantine pendentive, but always decorated with a false and unconstructional system, which is often quoted as a happy invention of the Saracens, but is in reality one of their great blunders.

This is the stalactite or honeycomb carving, which always consists of the same form, repeated and combined in different ways. The single atom, so to speak, is a small pointed arch, curving forward at the apex and resting on two upright supports with a recess between them: these in their turn rest on nothing whatever; but below each one comes the apex of another arch, also curving away beneath it, and providing no kind of support, real or apparent.

To suit the pendentive form, the lowest point is a single arch, each row above it containing one more than the last, and overhanging it. Thus the series gradually spreads out and terminates under the drum. Of course, being carved in solid stone, the system has no constructional value, in which case it would obviously be impossible; but merely as a decorative design it is most objectionable, since it suggests a *tour de force*, especially when, as is often the case, the supports of the arch are treated as small columns with capitals, and sometimes are actually hung from the arch as pendants. It would hardly be fair, in dealing with a decorative and fanciful style, to expect logically decorated construction in all positions, but in a pendentive beneath a dome there should certainly be a suggestion of support in the method; whereas the Saracenic stalactites make the pendentive appear to hang from the dome and to have no more power of supporting it than a piece of tapestry let down to conceal an awkward corner. In fact, the masonry in some cases has been left plain, and the architect has perversely covered it with stalactites carved in wood, which have since partly or entirely collapsed and reveal the simple construction behind them.

Compared, for instance, with fan-tracery, where the lines of the ribs and liernes help to suggest the construction of the vault, though not actually supporting it, the inferiority of the Eastern system is apparent. And the same may be said of the Cairene cornices, which consist of tiers of stalactites, as in the pendentives, when compared with the bracket cornice of the Classical and Renaissance periods.

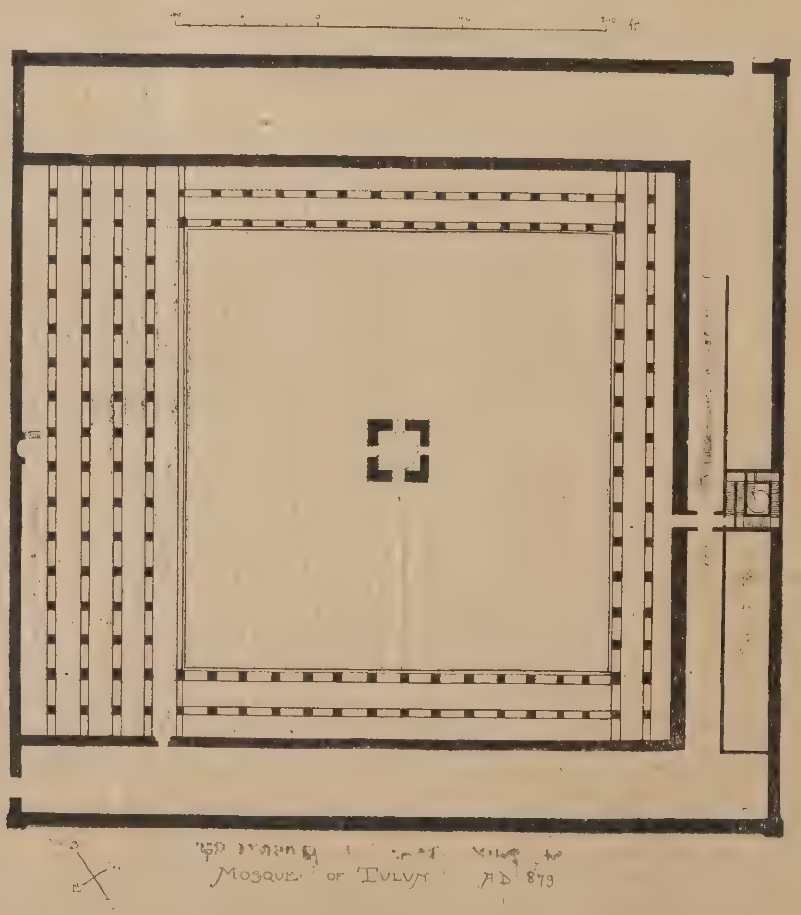
On the exterior of the dome the transition from the base of the drum to the square substructure was managed by cutting away the angles of the latter over the pendentives in the shape of steps which are sometimes enriched with large mouldings; by this means the square was brought to an octagon and could receive the circular drum direct. From a constructional point of view the most surprising fact about the mosques is the very slight resistance which can be offered to the dome's thrust. The substructure is generally isolated on three sides and has no buttresses of any kind, while the dome is raised on a drum of some height which brings its section to that of an extremely stilted Gothic arch, or something approaching it. The masonry of the dome is of extraordinary lightness, perhaps not more than 8in. or 9in.; but then so is that of the drum, where 18in. or so has been found solid enough to support a dome 30ft. or 40ft. in diameter. As seen in section, the dome could not stand a moment if it were an arch or a vault, and this fact is noted by Fergusson in dealing with the Indian domes, where the architect seems to be able to play with his construction in the most surprising way. Bearing in mind the English chapter-houses, with their central pier and elaborate buttresses, it is nothing less than a revelation to see the lightness and boldness of the Saracenic domes.

The principles of lighting may next be considered. In the cloistered mosque the windows were naturally of slight importance: every part of the building was open to the air and brilliantly lit through the arcades, so that no cross lighting from the outer walls was required; even in the cruciform mosque the central court provided ample light for the four recesses. Besides this, in a climate where light means heat, there is every reason for obtaining as much deep shade as possible, so that in Saracenic work there is no tendency to the large window-spaces of the Gothic styles, and as a general rule the window was introduced, not as a means of obtaining light, but as a particularly brilliant piece of wall decoration. The lights have square or arched heads, and may be used singly or grouped under a circular opening, in which case the arrangement recalls that of the Early English transition to plate tracery. Their position on the wall was restricted by no rules, except that they were always very high up. The eastern arm of the cruciform mosque uusually contained two or more lights grouped symmetrically above the prayer-niche, but the three other transepts, so to speak, being less ornately treated, were not bound to have any at all.

With the tomb-chapel beneath the dome the case is different. Any light which might enter had to pass through the windows, and here they are more numerous, though still small. A circle of them was set in the drum of the dome, and the walls, down to the level of the springing of the pendentives, were pierced with groups. Below this point, however, they were rarely placed, and the general effect of the mausoleum, where the stained glass still survives, is that of a cool and shadowy chapel, with its darkness partly dispelled far overhead by rings and patches of rich light, subdued yet gorgeous, like glowing jewels.

Instead of stone tracery the lights are filled with a sheet of stucco about an inch thick, in which, while still soft, small holes of irregular shape are cut, forming the pattern, of which the glass is the filling. There are certain types of design most commonly found, such as conventional trees or vases of flowers, and there is no great variety of these.

The glass itself is very crude and violent in colour—red, green, blue, yellow and purple, all



MOSQUE OF TULUN AD 879

of the harshest tones—but in small pieces, separated by the thick lines of the stucco and set at the right distance above the eye, the general effect is surprisingly rich and beautiful.

Some general principles of Saracenic decoration still remain to be considered. In the first place, the Arabs aimed at concentration of ornament with the relief of plain surfaces, except in the case of very small mosques, where it was possible to apply minute decoration to the whole of the internal wall-surface without producing an over-elaborate effect.

On the exterior the points to which attention was directed were the porch and the minarets, besides the dome, already noticed.

The former was, in the best period, always modelled on one example, and consisted of a high and narrow rectangular recess, rising almost to the cornice and terminating in stalactites, leading up to a small semi-dome. The door is of no great height, generally square-headed and surmounted by windows. Beautiful examples of attached columns, running friezes, and inlaid work are found on the three internal sides of these porches. The minaret was necessary for the summoning of the people to prayer from some commanding position where the voice of the mueddin could be heard at a distance, bells of every kind being strictly forbidden. It rises from the general level of the exterior as a square tower containing a winding staircase; the square changes to an octagon and again to a circle; balconies project at various heights, supported on stalactites, and the top storey consists of a ring of small columns, standing free, and crowned by a bulbous dome with a sharply-pointed apex.

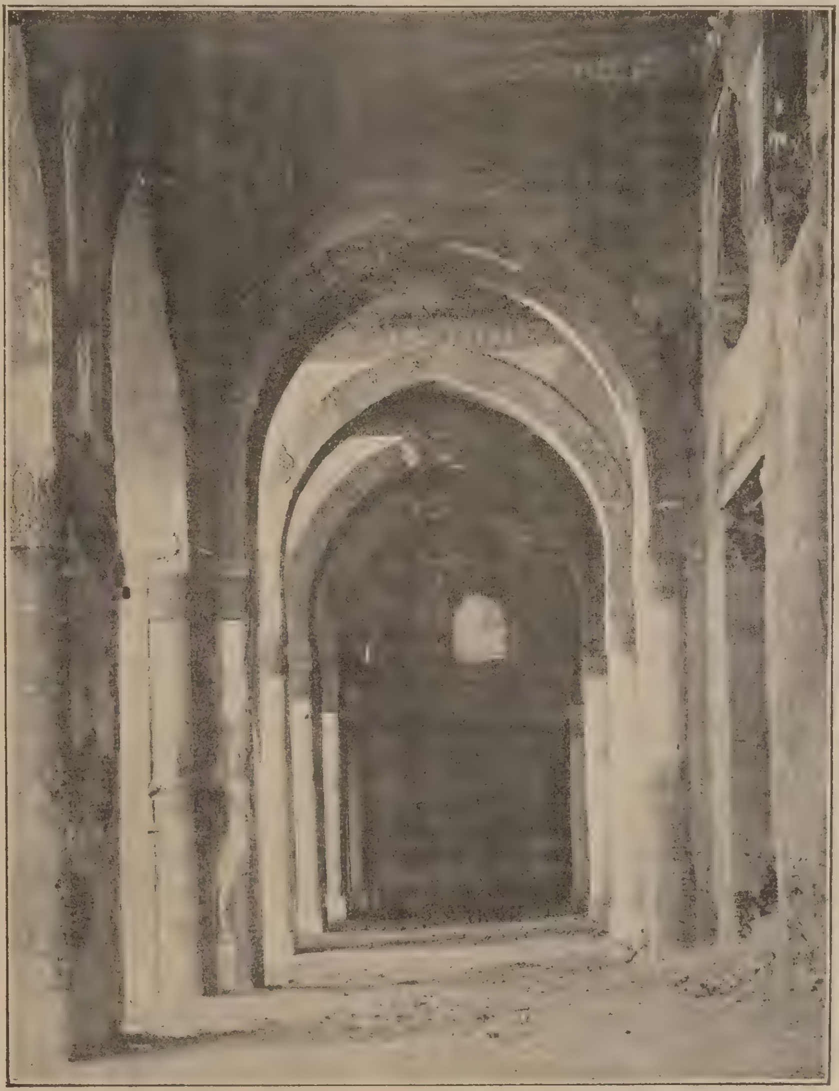
The whole surface is richly decorated with colour and relief, and in proportion and beauty of detail many of the Cairo minarets are worthy to be ranked with the Gothic spires and pinnacles, if their colour and delicacy may be held to compensate for the absence of the grandeur and solemnity of the Western work.

In the interior, decoration is lavished on the prayer-niche, which is always a beautiful piece of surface design elaborately treated with marble panelling, dwarf colonnades, mosaic and precious stones.

The arcades, if not vaulted, are covered with a flat wooden ceiling, in which the beams are square at the ends, but in the centre rounded and carved underneath; coffering is found, but nearly all the structural woodwork has had to be completely restored. The ubiquitous stalactites are used to mask the corners, and as brackets to support the beams. The pulpit may be of stone, but more commonly of wood, minutely panelled and subdivided: it is always set against the eastern wall, close to the prayer-niche, and has a flight of steps facing the court, so that the preacher simply ascends the stair and stands on the platform at the top, or rather on the top step but one, as a mark of deference to Mahomet himself, whose own position it would be presumptuous to occupy.

There were no choir-stalls or any other fittings which would offer scope for wood-carving, and perhaps the only remaining form of woodwork which calls for notice is the well-known mushrebîyeh lattice, formed of small turned pieces fitted together in geometrical patterns. It is mostly used in window openings of private houses, and, being restricted to very few forms, it is monotonous from a decorative point of view and of no particular interest.

There are said to be over 300 mosques in Cairo; but, like the Roman churches, it is not necessary to describe or even visit all of them; it will be enough to mention briefly the most notable examples of different kinds and periods. The starting point of the independent Saracenic style is the mosque of Tulun, the largest of the cloistered type. Before its erection marble columns, taken from earlier buildings, had been used with semicircular arches to form the arcades, as in that of Amru, outside the city. Ahmed Tulun's architect, however, undertook to build with new materials, and thereby saved numerous Coptic churches (he was himself a Coptic Christian), the destruction of which would have been necessary if marble columns were required. The work was begun in 876 A.D. and finished in two years, the material being plastered brickwork throughout. In plan the outer enclosing wall is 500ft. square and forms an outer court: the central court itself is 300ft. square, and is surrounded on three sides by double arcades, and on the fourth by five rows. The arches rest on square piers treated with attached shafts of the same material at their corners, and are the first known examples of the use of the pointed arch throughout a building, being somewhat obtuse in form, with a slight return at the springing. Between every pair of arches there is a niche-like opening, and the surface of the wall facing the court is decorated with large rosettes and terminated with a frieze of the same kind and a pierced cresting. Further decoration is on the arches and piers in the form of bands of carved stucco with a conventional foliage design, which shows none of the radiating form afterwards so common. Small windows are set in the outer wall, filled with beautiful pierced screens of geometrical pattern, and the roof is of date palm and sycamore, and has no decorative feature. There is a minaret with a unique external winding staircase. A certain massiveness distinguishes the mosque from other cloistered examples, and it contains no stalactites, and in fact very little characteristic Saracenic decoration at all.



INTERIOR OF ARCADE, MOSQUE OF TULUN, CAIRO.

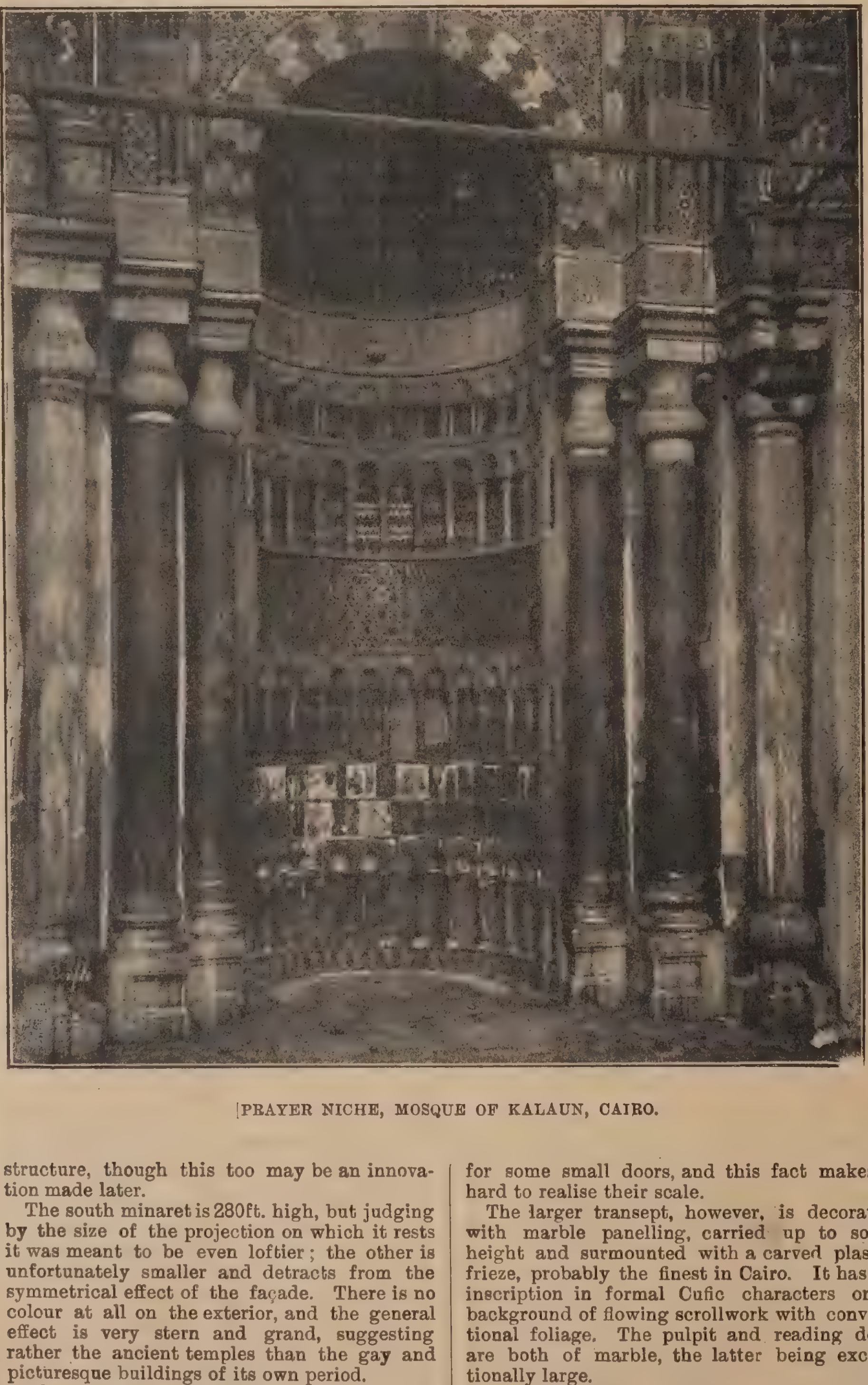
El-Azhar, dating from 973 A.D., is more irregular in plan than Tulun, consequent on its having become the great Mohammedan university shortly after its erection. The Mecca side of the court was extended until it contained ten rows of arcades, some with a second storey, and all having old marble columns and capitals, with arches resembling a stilted "Tudor."

The finest and most important mosque in Cairo, however, is of the second type, with a cruciform interior. It was begun in 1356 A.D. by Sultan Hassan, and finished in three years (see centre plate). In scale and proportions it is so huge that it seems to stand outside the style altogether, and differs largely from the average work in many points. In plan it is of irregular shape and about 500ft. by 250ft. extreme dimensions. The architect appears to have realised fully the changed conditions under which he should work in dealing with proportions so unusual. In the first place he aimed at a dignified symmetry, and with this object placed the tomb-chapel on the centre line behind the Mecca transept; on either side of it he planned a symmetrical eastern façade, terminated at the angles by projections for minarets. In accordance with the usual custom, the angles of the interior were filled in with numerous small rooms and passages, in some places of eight storeys high (which, for the sake of simplifying the plan, are here omitted), and the exterior outline of the plan should therefore have been a plain oblong. But unfortunately he encountered difficulties about the site at the west end.

Possibly the Sultan did not wish to disturb the existing streets and houses, though he might be expected to have appropriated just what he wanted. At any rate, the line of the streets was followed with disastrous results on the west side, though they are more obvious on a plan than they seem on the spot.

The worst point is the position of the main entrance, which would have added greatly to the effect of the whole if it had been on the centre line opposite the eastern transept. As it is, it occupies the north-west angle, facing north, and even so is not in line with the north side. As to the interior, the central court is open to the sky as usual, and the tomb-chamber with the dome only communicates with the rest of the building by two small doors.

The east façade is perhaps the finest part of the mosque: the material is the finest limestone, brought from the Pyramids and laid in regular courses 2ft. high. The total height of the wall is 100ft., and the cornice adds 13ft. more. The surface of the flanks is broken by high and narrow recesses containing eight tiers of windows, and the plain walling between them suggests the effect of buttresses. On the east front there are some larger windows, which light the mausoleum, and a certain amount of surface decoration. The dome is the largest in Cairo, being 70ft. in diameter and 175ft. high externally. It was rebuilt in the last century, when the section was probably brought down to the present form, as it would naturally be much sharper. It is unique in not resting on pendentives, but on squinch arches thrown across the angles of the square substructure, though this too may be an innovation made later.



PRAYER NICHE, MOSQUE OF KALAUN, CAIRO.

The south minaret is 280ft. high, but judging by the size of the projection on which it rests it was meant to be even loftier; the other is unfortunately smaller and detracts from the symmetrical effect of the façade. There is no colour at all on the exterior, and the general effect is very stern and grand, suggesting rather the ancient temples than the gay and picturesque buildings of its own period.

The principal remaining feature of the exterior is the porch, which became the model for all future entrances, though none equalled it in size. The door is set in a recess, which terminates in a semi-dome on stalactites, nearly 90ft. from the ground; the door itself is of moderate size and is surmounted by other openings. The magnificent pair of bronze doors, carved, pierced, and inlaid in radiating patterns, have now been removed to another mosque. Through the entrance, the vestibule is reached, crowned with a dome, surrounded by semi-domes all on stalactite pendentives: it is decorated with some richness in colour and relief.

A small stone-vaulted passage leads to the great central court, 117ft. by 105ft., and about the same in height, forming a cube, more or less, on each side of which opens a transept spanned by a single arch continued back as pointed barrel-vaulting. The three small transepts are 46ft. square, but the Mecca one is 70ft. across and 90ft. deep. All four arches are 90ft. high, and the vaulting behind them is of plastered brickwork, of stilted form in the case of the three first named. They and the wall-surface below them are perfectly plain, except for some small doors, and this fact makes it hard to realise their scale.

The larger transept, however, is decorated with marble panelling, carried up to some height and surmounted with a carved plaster frieze, probably the finest in Cairo. It has an inscription in formal Cufic characters on a background of flowing scrollwork with conventional foliage. The pulpit and reading desk are both of marble, the latter being exceptionally large.

The mausoleum itself has just as little decorative treatment. There is a marble dado and a carved wooden frieze; higher up, windows which have lost their stained glass, and dilapidated fragments of wooden stalactite carving, formerly in the shape of pendentives, but now so broken up that the squinch arches supporting the dome can be seen from below. The surface of the dome itself is quite undecorated, as indeed it is in most mosques, though the reason for it is not at all clear.

Generally considered, Sultan Hassan's mosque is a disappointment: its scale and general idea are superb, but the Saracens were not used to a dignified and "monumental" structure; decoratively, where they were at their best, it seems to have overwhelmed them with its size, and they hardly attempted to do much for it. The area covered is about 90,000 sq. ft., so that it claims comparison in all respects with the largest cathedrals. But the interior, though imposing, does not look its size, and suffers from the absence of a central feature, as the open court tends to break up the connection between the transepts. Had this court been covered with a great dome the effect would have been magnificent; but in such a climate this was not to be expected. The existing dome is only visible from the mausoleum, and as an external feature it might well have been higher.

Altogether, though this is one of the giant buildings of the world, it must be admitted that the Saracens succeeded more completely when dealing with moderate or small dimensions, and with this exception they wisely kept to them.

Many other mosques might be mentioned, such as Kalaun, which shows a great deal of Romanesque feeling, acquired by the Arabs in the Crusades, and contains, as the founder's tomb-chapel, an octagonal structure on eight columns which terminates in a kind of clerestory with pointed windows, and was originally crowned with a dome. Or Ibrahim Agha, with its splendid wall-lining of greenish-blue tiles. Or the two great gates of the mediæval city, with their massive domes of almost cyclopean masonry.

But the most interesting group of buildings of the late period is to be found outside the city and separated from it by a ridge of sand hills. These are the celebrated tombs of the Khalifs (see centre plate), all tomb-mosques of small size dating from the thirteenth to the sixteenth century. The largest is that of Barkuk, which follows the old cloistered plan, the arcades being vaulted domically in brick: it has two mausoleums which, with two minarets, are placed one at each angle, forming a symmetrical group. The gem of the whole style, however, is the mosque of Kait Bey (see centre plate), built in 1472. In plan it is very irregular, though not awkwardly so, like Hassan's. The mosque court is symmetrical, but the tomb-chapel is set at one corner, being of comparatively large size, while the minaret rises at a point just by the entrance porch, which itself is in a projection on the south side.

Within its limits, however, the exterior is perfect, as a picturesque group of very small scale. There is a certain regularity in the spacing of the windows and their height, and the wall-surface is broken by the recesses in which they are set. The dome itself perhaps rises rather abruptly from the octagon, in which the substructure terminates, but the decoration of its surface is a masterpiece of design and execution. The minaret is also well proportioned and groups beautifully with the entrance porch and the loggia on the other side of it. The absence of a cornice, which might seem a defect, is only to be expected in a climate where such a member would be of no practical use, and at this period of the style they are hardly ever found.

The interior is most elaborately decorated: every inch of the surface is either overlaid with marble or carved with geometrical or flowing patterns; the pulpit and reading desk, all the doors, screens, and other fittings are treated in the same way, and yet the effect is not overloaded or confused, partly owing to the diminutive size of the whole and partly to the taste and harmony of the decoration.

This mosque, in fact, shows the style at its best. The Saracens had no settled architectural idea like the mediæval Europeans. Their plans and arrangement of the different details are vague and follow no logical rules; considered on paper they come very far behind their Western rivals. And yet in surface decoration and colour effects the Arabs are supreme, as far as their religious precepts admit of it. They were instinctively artistic in everything they made, like the Greek and Gothic artists, and on the spot it is difficult to lay much stress on theoretical shortcomings in the face of the actual colours of walls, windows, marble, mosaic, and precious stones, all harmonised and luminous in the dazzling sunshine of Egypt.

Law Cases.

Architects as Arbitrators: Two Important Cases.—Two important cases affecting architects came before the Court of Appeal last Wednesday. These were *Chambers* v. *Goldthorpe*, and *Restell* v. *Nye* (see our issues for February 14th, 1900, page 31, and Jannary 31st 1900, page 414). In the former the plaintiff (an architect) sued for fees, and the defendant (a building owner) counterclaimed for negligence. The plaintiff had been employed to prepare plans for certain houses, to superintend the work and to measure it up when completed. By Clause 20 of the contract "a certificate of the architect, or an award of the referee hereinafter referred to, as the case may be, showing the final balance due or payable to the contractor is to be conclusive evidence of the works having been duly completed, and that the contractor is entitled to receive payment of the final balance. . . ." After the houses were completed the plaintiff measured up the work done and gave his final certificate. The plaintiff having sued the defendant in the County Court for the amount of his fees—namely, 4 per cent. upon £622 14s., the total cost of the work—the defendant counterclaimed for negligence by reason of the plaintiff having incorrectly measured up certain of the work done, whereby the certificate was for a larger amount than it ought to have been. The County Court Judge gave judgment for the plaintiff on the claim and for the defendant on the counter-claim for damages to be assessed. The Divisional Court held that the architect was, under clause 20 of the contract, placed in a judicial position between the building owner and the contractor with reference to giving his certificate, and, therefore, was not liable for negligence. They accordingly entered judgment for the plaintiff on the counter-claim. The defendant appealed. At the close of the argument by counsel the Master of the Rolls said that the Court would hear the case of *Restell* v. *Nye.* This action was brought by a building owner against an architect to recover damages for negligence. The defendant was employed in connection with the building of a bungalow in Sussex. He was to be paid for "plans, specifications and supervision of works" 5 per cent. upon the amount of the expenditure, travelling and out-of-pocket expenses to be charged extra. The defendant prepared a specification, and a tender submitted by a firm of builders at Brighton for the erection of the bungalow for £1,790 was accepted. A building contract was signed by the plaintiff, which provided that the price should be paid by instalments upon the defendant's certificates, and that his final certificate should be conclusive evidence that the builders were entitled to receive payment of the final balance. The work was completed, and the plaintiff paid the contract price together with the cost of certain extras on the defendant's certificates. The plaintiff alleged in this action that the defendant had omitted to check the builder's accounts with due skill and diligence, and had passed as extras works included in the contract and had certified for sums improperly passed. The building contract was in substance the same as that in the previous case of *Chambers* v. *Goldthorpe*. The only clause in which there was any material variation was the arbitration clause. Justice Mathew in the lower court gave judgment for the defendant, on the ground that he was in the position of an arbitrator and that an action would not lie against him for negligence. The plaintiff appealed. The Court dismissed both appeals. The Master of the Rolls said he would deal first with the case of *Chambers* v. *Goldthorpe*. The only question raised was one which arose on the counter-claim, and was this—whether Chambers was placed in the position of an arbitrator, or whether he was merely in the position of a person acting as agent for the building owner. If he was an arbitrator, then the building owner could not sue him for negligence; he could only sue him for fraud or collusion; and there was no suggestion in this case of anything of that kind. When they looked at the building contract it was plain that under many of the clauses of the contract Chambers was only to act as agent for Goldthorpe. But when they came to Clause 20, the question arose, did the architect still remain merely the agent of the building owner, or was he not an arbitrator? It seemed to him to be impossible to say with regard to Clause 20 that the architect's sole duty was to look after the interests of the building owner. The architect undertook the duty of bringing out a final certificate. With respect to that he owed a duty to the builder as well as to the building owner, his duty being to hold the balance fairly between the one and the other. It was argued that in this case there was no dispute, and that there could be no arbitration unless there was a dispute. In his opinion there might be an arbitration to settle what otherwise might be the matter of a dispute. His Lordship referred to the cases of *Clemence* v. *Clarke*, *Lloyd Brothers* v. *Milward* and *Stevenson* v. *Watson* (4 C.P.D., 148), and pointed out, with reference to the last-mentioned case, that Chambers had not merely to make an arithmetical calculation, but to use professional knowledge and skill. He came to the conclusion that Chambers was in the position of an arbitrator. He thought that the counter-claim could not be maintained, and that the appeal must be dismissed. For the same reasons he thought that the claim in the other case, *Restell* v. *Nye*, could not be maintained, and that the appeal in that case should also be dismissed. Lord Justice Collins said he was of the same opinion. The question seemed to him to be the same in both cases—namely, whether the architect was in the position of a *quasi*-arbitrator. If he was, then the case against him in each instance must fail. The question depended on this, whether he was in such a position that he was bound to exercise his judgment between the two parties impartially. It was suggested that he was only the agent of the building owner, and owed no duty to the builder. But in his opinion, when the building contract was read, it was clear that he was in the position of a *quasi*-arbitrator. An architect who was bound to give a final certificate, which should be binding not only on his employer, but on the other party, could not be said to be free from duty to the other party; he was under a duty to exercise his judgment impartially between the two contracting parties. And where a person was bound to exercise judgment between others involving professional skill he was an arbitrator. He therefore agreed that the appeals should be dismissed. Lord Justice Romer said he regretted to differ from his learned brethren. In the contract not only was there no indication that in measuring up the work and certifying the architect was regarded or treated as an arbitrator, but the provisions of the contract appeared to him to negative the idea that under that contract he was regarded as or placed in the position of an arbitrator. He thought that the appeals ought to be allowed.

Masters and Men.

Strike in the Aberdeen Plasterers' Trade.—The Aberdeen Operative Plasterers' Union held a meeting last week to consider the masters' decision to reduce the wages from the rate of 8½d. to 7½d. per hour. Towards the end of last year the masters complained of the dulness of trade, and intimated that they intended to reduce the wages as stated. The three months' notice having expired notices were posted last Saturday week at the various yards intimating that after that date the rate of wages to be paid would be 7½d. per hour. The men have refused the new terms and have been paid off. About 100 men are affected by the dispute.

PRESENT CONDITION OF THE BUILDING INDUSTRY.

MR. THOMAS BLASHILL, the late superintending architect to the London County Council, read a paper last week before the Surveyors' Institution on "The Present Condition of the Building Industry."

He insisted on the radical difference between the crafts that make up the building industry and the class of solitary trades and manufactures. The architect, the mason and the carpenter were not isolated artists like the statuary or coppersmith, and should any worker not understand his fellows or not look beyond his own department to the scheme as a whole, or should he act stupidly or maliciously, the whole must suffer.

The client, who was the source of all fees, wages and profits, was entitled to more consideration than he usually received, and it was not certain that architects, who were nearest him, always understood him as well as they ought. Many of them could speak from experience of the difficulty of getting his real meaning from him and embodying it in drawings so that he understood what he was getting for his money. But no pains were too great to ensure that he did, and a young architect could scarcely have a worse reputation than that of exceeding his estimates. Still, the architect must act fairly between the client and the contractor, especially in view of the fact that many persons, whether in their private capacity or as members of public bodies, thought it fair to take every advantage of the contractor and expected the architect to assist.

None but builders of good reputation should be allowed to tender; it was practically impossible to convince a committee, on the clearest evidence, of the unsuitability of a particular builder if his tender was the lowest. Sub-letting by the contractor was properly discountenanced when there was danger of his losing control of the work, or of introducing a person whom the architect might have reason to distrust, or of lowering the quality of the work. But, on the other hand, it was a very risky practice to introduce into a contract a great number of special works for which the architect had made arrangements with other parties whose tenders he put down in the specification, stipulating for the general contractor to adopt these parties as sub-contractors and pay them the amounts of their tenders. It was said that the secrets of trade lists and discounts could not be penetrated by the architect, and that the system could not be altered. If that were so the architect should cut the knot by demanding to know the lowest price to a safe cash customer, or, if that were inconvenient, should keep the reins in his own hands and see that a sufficient profit, and no more, was allowed the contractor. The worst feature in the system of discounts was that they furnished a fund from which secret commissions could be paid to persons ordering particular goods for their client. The best course was to let the contractor make, or buy, and fix everything that could be safely left to him. The modern builder on a large scale should have a fancy for machinery and be ready to seize on improvements. So far as practicable, improved conditions of labour in the shop were being applied on the building, but it was not certain how far in London this was due to native smartness, or the example of Scotland and the North, or the pertinacity of American inventors.

In discussing the English builder of to-morrow it was impossible to ignore the work of the American builder of to-day, who was a constructional engineer. With us a first-class city building might rise at the rate of one storey in three weeks; a New York building of which a model was shown in the Paris Exhibition shot up through its ordinary and plainest storeys at the rate of two storeys a week, and in the artistic upper and lower storeys the rate could not have been much slower than one per week.

Coming to the subject of the building operative, Mr. Blashill paid a tribute to the skill of the old artificer in wood and stone, and then referred to the depressing effects of time-wages, and the fixity of position of such men without reasonable expectation of betterment while craftsmen, and with no assurance of a comfortable provision against old age. The trade union was a natural engine for accomplishing what the isolated craftsman could not bring about for himself. In regard to the prevention of sweating, questions between payment by time and payment by results played a leading part. Not that in the eyes of the workman there was anything specially sacred in either; there were now far more men, trade unionists, paid by the piece than by time, and payment by piece was as stubbornly fought for in some trades as payment by time in others. What really was the fair day's work of which the fair day's wage was the equivalent? "Labour" was often confused with "time," with mischievous results. Not workmen only, but the rest of us, got into a habit of talking about our "time" as if it were something valuable by which money ought to be made. But mere time was worthless to anyone except the owner, if even to him. What the employer really bought was so much improvement to the material he put before the workman as might reasonably be expected to be done in the time by which the payment was calculated. This was simply measurement by the town clock instead of by the 5ft. rod, and if a day's work were a fixed quantity the clock would measure it as accurately and much more conveniently than any scale of feet and inches. Yet, on this side the Atlantic, no workman, no employer, no public authority had seriously attempted to apply in our own industry any kind of measurement, even the rudest, to the "day's work" itself. Surely the Chicago plumber's method of declaring how much he would do in seven hours and then claiming the right to do it in five with seven hours' pay was in principle honest and fair. The desire to have an easy time was common among time workers of every class, but a more serious matter than mere idleness was the deliberate loitering of which employers had long complained. There was also the important question of work lost to trades by changes in modes of construction, apart from the policy of employers or employed. Thus, the demand for fire-resisting construction had already affected the carpenter very seriously. Mason's work, which for a time recovered its place after a long struggle with imitative cement, had now to compete with cut-brick work and terracotta; it was said that this change was due to a mason's strike. In the case of the plasterer, such disputes were dangerously interesting. There were a dozen substitutes for plaster—none perhaps quite satisfactory, but a single architect was now using one of them by the acre—and he had let slip the artistic and interesting branch of his work. On brickwork, which seemed least liable to be supplanted, concrete was encroaching fast—concrete that just failed to become a dangerous substitute twenty years ago, when brickwork was hardly more than half its recent price.

Apprenticeship of the old pattern, in which the youth was bound for seven years, during two or three of which he learnt very little and was of little use, was vanishing with other mediæval customs. The workmen had deemed it necessary for their own protection to limit much more stringently than formerly the admittance of apprentices; indeed, in some trades it was practically impossible to get a boy apprenticed uuless he was the son of a man in the trade. The position of the building operative had been improving, and there was no reason why he should not, like the poorly-paid French artisan or the doubly-paid American, leave his work at night in a condition as to dress and general appearance good enough for any company into which he might care to go. We were as yet only at an early stage in technical education; at present it was necessary to see that public money was spent only on such as had actually entered their trade, but this was not a rule without exceptions, and the knowledge of tools and processes must very soon become as common as the knowledge of arithmetic. In conclusion, Mr. Blashill asked why all those engaged in the building industry should not learn the different crafts that composed it in the same school and at the same bench, at least so far as they had to travel together. The workmen would leave comparatively early in the journey and the rest at stages which preference or necessity might dictate. But so far as they might journey together they would be learning the very same things. They would understand each other for the rest of their lives, and, if one who might have started with lower ambitions should find his way into the higher grades of the industry, it was not the class to which the speaker belonged that would begrudge him the success he had earned.

CEMENT MANUFACTURE.

At the meeting of the Institution of Civil Engineers held on February 26th last a paper on "The Rotatory Process of Cement Manufacture," by Messrs. W. H. Stanger, M.I.C.E., and B. Blount, A.I.C.E., was read. It described the rotatory process of manufacturing cement, which presented the advantages that the operation was conducted continuously and mechanically instead of intermittently and by the aid of much hand labour, and that the product was better and more uniform than that obtained by the old method. By this process it was possible to approach the theoretical ratio of acids to bases represented by the equation $\frac{CaO}{SiO_2 + Al_2O_3} = 3$, and to obtain a cement which was stronger and sounder than the best cements commercially prepared by discontinuous processes. The output per unit of plant was more than double that of the best fixed kilns, and the consumption of fuel was smaller; a cheaper class of fuel, namely, small coal instead of coke, could be used. Various forms of fixed kilns were described and discussed, and their merits and defects were pointed out. The history of the evolution of the rotatory kiln was traced. The earliest practicable form of rotatory kiln had been invented by the late Frederick Ransome, A.I.C.E., who burned powdered raw materials in a revolving cylinder heated internally by producer-gas. His chief object had been to produce cement already ground, but this had necessarily failed because powdered raw materials agglomerated during burning; the process had not been successful because the clinker produced adhered to the firebrick lining of the kiln and ultimately destroyed it, and because a high and regular temperature could not be maintained by producer-gas without the use of regenerators, and when these were used they became choked with dust from the materials in the kiln.

The next important improvement in the rotatory kiln had been effected by Mr. Wilfrid Stokes, A.I.C.E., whose apparatus presented many features of interest. In this apparatus slurry was dried on a drum heated by the waste gases of the kiln. The kiln itself was heated internally by producer-gas, and the hot clinker was passed down a cooling cylinder, where it heated the air used in burning the producer-gas; thus its heat was regenerated. The apparatus had worked well save for the corrosion of the firebrick lining by the clinker and the difficulty of controlling the temperature. Various forms of lining had been tried, including bauxite bricks, but without complete success.

The percentage of coal needed to burn raw materials to cement clinker was computed under various stated conditions. The calculated minimum quantity amounted to 8·23 per cent. on the weight of the clinker when dry raw materials were used, and the waste gases escaped at 300deg. C. (572deg. Fahr.). When the raw materials were in the form of slurry containing 40 per cent. of water, the calculated minimum quantity was 19·40 per cent. with the waste gases at 300deg. C. (572deg. Fahr.), and 17 01 per cent. with the waste gases at 200deg. C. (392deg. Fahr.). Tables were given showing the allocation of the heat to the performance of the chemical reactions necessary to produce clinker, to the heat lost in the clinker and in the waste gases, and to the drying of the slurry when wet raw materials were being dealt with. This last-named item was large, being nearly 50 per cent. of the total quantity of heat requisite.

The successful development of the rotatory process in America had been aided in great measure by the cheapness of petroleum in that country. The difficulty of obtaining and maintaining a high and uniform temperature disappeared when oil was substituted for producer-gas. The lining trouble had remained except in one case where it had been completely overcome. The largest and most complete installation of rotatory kilns was that at the works of the Atlas Cement Company of Northampton, Pennsylvania, which had been examined by the authors in 1898. The output of this works was between 8,000 and 9,000 tons per week, *i.e.*, about four times the amount of most large European works, and the whole quantity was obtained from rotatory kilns. There were at present 51 kilns in operation, and 48 were about to be added, nearly doubling the output given above. The whole of this plant was on the rotatory system invented by Messrs. Hurry and Seaman. The raw materials used by the Atlas Company were a calcareous shale and a limestone. These were crushed, dried, finely powdered and fed mechanically into rotatory kilns. The kilns were steel cylinders 60ft. by 6ft. 6in, set on a slight incline, and capable of being rotated by suitable gearing. The fuel was powdered coal driven in by a blast of air through an injector burner at the lower end of the kiln. An intensely hot flame, readily controllable, was thus produced, and heated the raw materials introduced at the upper end of the kiln, and caused to travel downwards in a direction opposite to that of the blast. The materials were thus heated systematically, and at the lower end of the kiln near the burner became converted into clinker. This fell into a rotating cylinder lined with firebrick, through which passed a current of air serving to feed the coal-dust flame. A great part of the heat of the clinker was thus regenerated. The clinker was then roughly crushed between rolls which worked under a spray of water and passed through a final rotating cooler into trucks, by which it was conveyed to stock-boxes over the grinding-plant. Huntingdon mills were used for the whole of the grinding-plant, whether for raw materials, powdered coal or clinker. From the crushing of the raw materials to the storing of the finished cement no hand labour was employed, all conveyance, distribution and transmission being done mechanically. The firebrick lining of the kilns was protected by a layer of clinker which was perfectly effective. The crushing, watering and cooling of the clinker had the effect of maturing the cement, and storage and aeration usually necessary for cement made by the old process were abolished. Tests and analyses of the cement showed it to be of high quality and perfectly sound. The cost of manufacture did not exceed 12s. 6d. per ton, as against an average of 20s. for cement made on the old system. The process could be applied with success to wet raw materials, and a large plant for treating these was now being erected in this country. When wet raw materials were used they were pumped in the form of slurry into the upper part of the kiln which was then unlined, and were dried by the waste heat of the furnace-gases. In other respects the process was identical with that using dry raw materials. A table of comparative costs of the old and new systems was given, which justified the conclusion that the complete replacement of fixed kilns by a well-devised rotatory system would take place in Europe as it was already occurring in the United States.

Improvements at Bude.—A new post office building has been erected recently in the centre of the town on the site formerly occupied by a part of the Globe Hotel. Mr. Beckley, of Holsworthy, is the builder, and Mr. James Crutchett, of Stratton, the architect. On part of the site a couple of shops will also be erected, and on the other part a new hotel, to be called the Blanchminster. The footpath from the railway station is also being made. It is hoped that the Bude water supply will very soon be commenced, and the lighting is also to be taken in hand.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Coloured Mortar and Bricks.

NEWCASTLE-ON-TYNE.—B. P. writes: "How should a lightish mortar be composed to get a picturesque effect with red brickwork? How is the yellow coloured mortar sometimes seen in south country houses obtained? Where can rich coloured thin red bricks of interesting surface be procured and would their carriage here make them very ruinous in price? Do you know who makes "Keymer" bricks? Can the mouldings of sash bars be placed outside with satisfactory results, exterior effect being chiefly considered?"

To me the questions are somewhat vague. If the mortar is intended for pointing brickwork, a light coloured mortar is composed of lime, putty and sand, and a yellow coloured mortar is composed of lime, putty, yellow ochre, silver sand and copperas, the proportions being regulated according to the desired shade. If the mortar is intended for external plasterwork, a yellow tint is obtained by an admixture of yellow ochre, or yellow oxide, with the material used for the setting coat. A durable yellow tint is also obtained by using a bright yellow sand, such as Arnold's Fletic sand for the setting coat. Red coloured thin red bricks with more or less interesting surfaces, may be procured from most brick manufacturers; apply to some of the makers who advertise in the columns of this journal as to red bricks and Keymer bricks. Moulded sash bars, wood or iron, can be placed outside with satisfactory results if painted periodically. Exterior effect depends upon the design. W. MILLAR.

Architects' Registration Bill.

LONDON.—A. B. writes: "I have noted your recent replies about the Architects' Registration Bill, but I should be glad if you could give me any information on the following points:—In the event of the Bill becoming law, will an assistant who served some years in a builder's office to gain experience, and is now an assistant in an architect's office, be entitled to be registered without examination, provided he has served altogether the stipulated seven years before the passing of the Act? Can you say what the qualifying examinations will be?"

We do not think it expedient to further discuss in detail a Bill which has not yet been passed in substance. Sufficient particulars have already been given by us in the replies mentioned.

Drawings for Patents.

BELFAST.—LAGAN writes: "Are drawings for the Patent Office to be made on cloth; is colour desirable; and what scale should be adopted?"

For all information regarding patents apply to the Comptroller-General, Patent Office, 25 Southampton Buildings, Chancery Lane, W.C. So far as we know, it is not imperative to make drawings on cloth, but it is probable that there are certain regulations as to size. Colour and wash work are not allowable, as the drawings in the specifications have to be reproduced in line, not in half-tone.

A Book of Poems "Arranged as Parts of a Gothic Church."

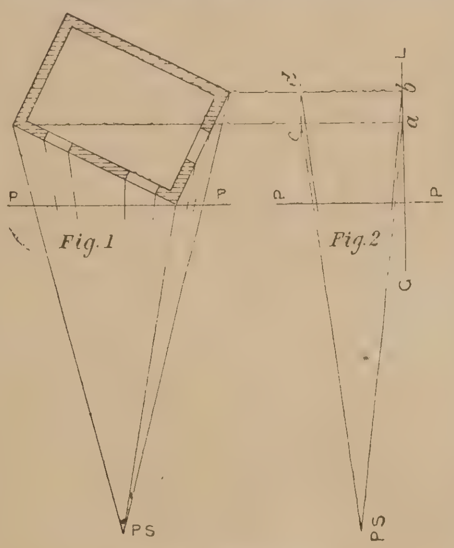
SOUTHPORT.—QUERIST writes: "I should be glad of any information concerning the authorship or editorship of a book published by Messrs. James Parker and Co., of Oxford, called 'The Cathedral: or, the Catholic and Apostolic Church in England.' The copy before me is the third edition, dated 1841, and the preface bears date 1838. The book is a book of poems 'arranged as the parts of a Gothic Church.'"

The author of "The Cathedral" was the late Rev. Isaac Williams, the following account of whom is taken from "Foster's Alumni Oxonienses (1715-1886, page 1,568):—"Williams, Isaac, 3s. of Isaac Lloyd of Cwmcynfellin, Co. Cardingan, arm. Trinity Coll., matric. 7 July, 1821, age 18; scholar 1822-31. B.A. 1826, M.A. 1831, fellow 1831-42, B.D. 1839, philosophical lecturer and tutor 1831-42, dean 1830, rhetoric lecturer, vice-president 1840, held various curacies 1829-42; wrote Nos. 80, 86, and 87 of 'Tracts for the Times,' died 1 May, 1865, father of Anthony C., and of John Edward."

Office Perspective.

EDINBURGH.—PERSPECTIVE writes: "In the issue for February 13th your reviewer of 'A New System of Perspective' states that architect's perspective is substituted owing to the 'school' system being too complicated for office use. Is there a recognised system for the preparation of architectural drawings?"

There is no one general system in use in offices, but the simplest method is shown in the accompanying figures. Any draughtsman can adopt it, though he knows nothing of perspective, but of course the difficulty increases as the building becomes more complex. The plan being pinned down on a table, the point of sight, P S, Fig. 1, is selected, which may be off the paper, and perpendicular to this a line P P is drawn, representing the picture plane and touching the nearest edge of the building.



OFFICE PERSPECTIVE.

This may be on a strip of paper pinned down in place if the sheet which contains the plan is not large enough. Then marks are drawn across line P P from all the important features of the plan. The strip is then taken up and pinned horizontally along the bottom of the sheet upon which the perspective is to be drawn, and verticals through these points will give the position, on each side of the centre, of all vertical lines in the perspective. To cut them off at the right height the following procedure may be adopted. Pin down a new strip of paper, P P, Fig. 2, in the place of the former one, to represent a vertical section of the picture plane, and another strip, G L, to represent the distance of the ground line below the line of sight from P S, and drop perpendiculars on G L at *a* and *b* from the angles of the building, produce to *c d*, so that *a c* and *b d* represent the height of these angles; then lines drawn towards P S will cut P P at the heights above G L required for horizontal lines to cut the verticals on the perspective representing these angles. The perspective of the rectangular block is now drawn by joining these intersections, and, the converging lines being produced, the vanishing points will be found. Any other height, as windows, doors, &c., is set off on the line representing the nearest angle in the perspective, and drawn towards the vanishing points to intersect the verticals. HENRY ADAMS.

Claims in Respect of Defective Work.

BROADSTAIRS.—C. W. writes: "An alteration to business premises intended and specified to be done well has been carried out badly. It was of great importance that the place should be opened as soon as possible, so very little could be condemned and re-executed during the progress of the works. This is clearly unfair to the clients, who desired and agreed to pay for good work. Can a deduction be made at the settlement; and, if so, how should a fair sum or percentage be determined? Should the builder be allowed to stop small shrinkages in hardwood joinery fitting?"

A case of this sort is very difficult to deal with. The right course to have adopted was that of insisting upon sound work, trusting to a properly-worded penalty clause in the agreement for compensation for any resulting delay. This not having been done, the certificates given from time to time have become *primâ facie* evidence that the work is satisfactory, unless they were endorsed to the contrary. Now the only thing to do is to refuse the retention money until all defects are rectified. If they cannot be rectified, a substantial claim for damages will have to be made on behalf of the client, and, if necessary, carried to arbitration. It is better to do this, and to have shrinkages, &c, put right by a reliable man, than to trust again the builder who has proved unsatisfactory.

G. A. T. M.

Nuisance Caused by Drain.

AN OLD SUBSCRIBER writes: "Several years ago a speculating builder erected four or five houses on a piece of land in an urban district adjoining a street (at which time no main sewer existed) and laid a drain entirely within his ground emptying into a cesspool. At the end of the drain in the garden of the end house (now belonging to A) there is a syphon close to the garden wall, which adjoins the street where the drain connects with the Council's sewer. A complains that a nuisance is caused by the syphon sometimes becoming choked, and calls upon the Council to rectify the matter. What course should the Council take? Part III. of the Public Health Acts Amendment Act, 1890, has been adopted in the urban district."

Having adopted Part III. of the Public Health (Amendment) Act of 1890, the District Council have good grounds for declining to acknowledge any liability for the maintenance or repair of the drain and syphon referred to. Clause 19 of this Act states: "(1) Where two or more houses belonging to different owners are connected with a public sewer by a single private drain, an application may be made under section 41 of the Public Health Act, 1875 (relating to complaints as to nuisances from drains), and the local authority may recover any expenses incurred by them in executing any works under the powers conferred on them by that section from the owners of the houses in such shares and proportions as shall be settled by their surveyor or (in case of dispute) by a court of summary jurisdiction. (2) Such expenses may be recovered summarily or may be declared by the urban authority to be private improvement expenses under the Public Health Acts, and may be recovered accordingly. (3) For the purposes of this section the expression 'drain' includes a drain used for the drainage of more than one building." If the drain or syphon becomes a nuisance, the Council should take action as there laid down. The evidence and decision given in the case of *Seal* v. *Merthyr Tydvil* District Council (Queen's Bench Division, July 10th, 1897) will repay careful perusal. In this instance the Council had adopted the Public Health (Amendment) Act of 1890. The following brief outline gives the main facts. A drain was made at the back of houses Nos. 21 to 40 Cromwell Street, Merthyr Tydvil, running through the gardens of the houses, and then joining the sewer of the District Council. Each house was connected to the drain at the back by means of a branch drain. This drain, being in a defective condition, became a nuisance, and proceedings were taken under Section 41 of the Public Health Act, 1875, as amended by Section 19 of the Public Health (Amendment) Act, 1890. The District Council contended that the drain running at the back of the houses was a private drain under the definition in Section 19 (3) Public Health (Amendment) Act, 1890. The local magistrates found that the drain was "a drain used by two or more houses belonging to different owners, and that it was a drain for the particular houses Nos. 21 to 40, and for no other premises." An appeal was made against this decision, but it was upheld by the Queen's Bench. The judges (Mr. Justice Cave and Mr. Justice Ridley) considered that the intention of the Act was to relieve the public from paying for that which they were not allowed to use, and that this drain was a private drain, insomuch that there was no power to drain other houses into it. The case now submitted appears to be generally analogous to that occurring at Merthyr Tydvil.

T. E. C.

Agreement between Builder and Client.

Belfast.—Archos writes: "I should be glad if you could give the correct form of agreement between builder and client, and also the correct form of bond. Are printed forms obtainable, or should the architect write them himself?"

A building agreement must state clearly the nature of the work to be done, the conditions under which it is to be performed, and the consideration or payment for its performance, and must be signed by each party in the presence of a witness who must sign as witness, be dated, and be deposited at any post office within fifteen days of its date in order that it may be stamped, for which a charge of 6d. is made. A form of agreement, which includes a set of conditions of contract in very general use, but not in all respects suitable to country practice, is published by the Royal Institute of British Architects, 9 Conduit Street, Hanover Square, W.; but it is quite sufficient if the form be worded as follows, the various plans and documents referred to being also properly numbered and initialled on every page by both parties.

FORM.

Agreement made the ...... day of ...., 19.., between .... (*full name*) .... of ...... in the County of .... hereinafter called the Employer and .... (*full name or names*) .... of .... in the County of .... hereinafter called the Contractor whereby the Contractor undertakes to erect a .... (*house?*) .... at .... in the County of .... in accordance with plans numbered 1 to .... Conditions numbered 1 to .... and Specification written on pages numbered 1 to .... all being initialled by both parties hereto in consideration of the sum of .... which the Employer hereby undertakes to pay to the Contractor at the times and in the manner set forth in the Said Conditions.

Signature of Employer..............................
....

Witness to Signature of Employer ....
....
....
of ....

Signature of Contractor..............................
....

Witness to Signature of Contractor ....
....
....
of ....

There is generally no reason why the agreement should not be drawn up by the architect, but he is not allowed to charge for it. In the case of large and complex works, or where many interests are involved, it is best, however, to consult a solicitor, placing the R.I.B.A. form in his hands for guidance. If the quantities are to form part of the contract, they must also be referred to in the agreement in the same way as the specification. The period allowed for completion is usually named in the conditions, as is also the penalty for delay, which must be referred to as an agreed liquidated damage, and not as a penalty. G. A. T. M.

Period of Years' Purchase.

Bristol.—Surveyor writes: "Do the arbitration, or other, courts lay down any *fixed* number of years' purchase for the compulsory sale of freehold ground rents; and, if so, how many years' purchase? If there is no *fixed* rule, what is the usual number of years' purchase allowed? Would 10 per cent. for compulsory sale be allowed in addition?"

There is no fixed period. Every arbitrator follows his own discretion. A. O. H.

MAGDALEN COLLEGE, OXFORD.

THE Oxford Architectural and Historical Society recently visited Magdalen College. The president explained how the College was founded by William of Waynflete in the reign of Henry VI., on the site of the dissolved Hospital of St. John the Baptist. The founder being a schoolmaster as well as a cleric, founded not only a college, which was originally on the other side of the river, but a school called Grammar Hall on the site now known as St. Swithin's Quad. A portion of the building, the picturesque block admired by Ruskin, still remains. The outside of the west window of the chapel, with its battlements and niched figures, the Founder's Tower with the fine gate beneath it, now seldom opened, were viewed, then the chapel was entered and its various features pointed out. The windows of the anti-chapel were originally in the chapel—Lord Selborne restored them and had the present coloured windows put in the chapel. The west window was damaged by the storm of 1703, the storm which killed the Bishop of Bath and Wells and gave Addison the inspiration for his poem. The fine altar picture, supposed to be by Ribalta, was noted, then the party passed into the cloister through a small side chapel containing the tomb of the founder's father. The Hall was next examined. The president mentioned that the oak roof which originally surmounted it was about to be restored by the Senior Fellow, Mr. Garndly.

ENGLISH AND FRENCH CATHEDRAL ARCHITECTURE.

MR. ARNOLD MITCHELL, F.R.I.B.A., lectured last week upon some examples of English and French cathedral architecture at the Literary and Philosophical Institute, Newcastle-on-Tyne. Many would have read the latest books on this subject by the American author, Mr. Moore, and the English author, Mr. Prior. From these books, those who had read them would see what different opinions might be formed upon one subject by different individuals. Mr. Moore denied that there was anything original in our examples of Gothic architecture, whilst Mr. Prior took an opposite view. To approach the subject either in the way of contrast or comparison between the French and English churches they must consider the surroundings of the church. In English architecture it would be noticed that the outline of the building was designed so as to give a view of the building in its entirety, whereas in French church architecture the restricted site made it only possible to have a view of a portion of the building. Pictures of Wells and Rheims cathedrals illustrated this fact. The interior architecture of their churches had had a very great influence upon the construction of the whole building. In Lichfield Cathedral they had an example of this. Here they would find the vault roof and the indispensable buttress. In these vault roofs provision had to be made for the bearing of the stress and strain of the enormous weight of the building, hence the buttress and the flying buttress were imperative. The vault roof influenced the whole architectural development. King Henry the Seventh's chapel at Winchester showed admirably the distribution of the weight of the roof to the buttresses: as Mr. Moore in his book had said, "the building was simply a scaffold to hold the roof." Passing to the subject of interior decoration, the lecturer had thrown upon the screen some beautiful views of the interiors of several well-known French and English churches, notably Rheims, Amiens, Chartres, and Notre Dame cathedrals, which he described as being in the order named the finest examples of Gothic architecture in existence. One point which must have struck anyone viewing the interior of English and French churches was the difference in length presented. In English churches this reached 700ft., whilst the French were content with 300ft. or 400ft. Another difference that would be found was that of height. Someone viewing the interior of a French church had described it as a colossus on tiptoe. Although the English churches did not reach the height of 150ft., yet their symmetry was equal to any to be found elsewhere. The lecturer's comments upon the outside sculpture of the churches were particularly interesting, and although giving the palm to the French cathedrals for decorations of this kind he showed that what examples there were in this country were in every way excellent.

New Patents.

These patents are open to opposition until April 6th.

1900.—**Saw Teeth.**—4,825. J. M. Wilson, 96 to 100 Henry Street, Ancoats, Manchester. The teeth are so shaped and arranged that whilst some are scribing the wood others are cutting and removing the sawdust. A smoother and truer surface is thus obtained.

Fireproof Partitions.—23,211. The Fireproof Partition Syndicate, Ltd., and T. I. Cammell, both of 10 York Buildings, Adelphi, London, W.C. The metal framework is fixed to the joists at the top and connected to the other joists in such a manner that it may expand freely. The object is to avoid the bulging of partitions of this kind, having a metal framework covered with cement or plaster, when under the influence of heat.

The following specifications were published on Saturday last, and are open to opposition until April 13th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—2,177, Royle, heat-regulating devices. 2,221, Von Kalinowski, machine for nailing. 2,663, Gibbons and Gibbons, regenerative furnaces. 2,774, Bischof, conversion of white lead into oil paste. 3,844, Lancaster, apparatus for stirring the contents of acetylene generators. 4,220, Condy, pipe wrenches. 4,407, Stevenson, apparatus for generating and storing acetylene gas. 4,526, Clamond, gas stoves. 5,206, Walker and Hildred, safety-locking and releasing apparatus for lifts. 5,269, Restall, apparatus for drilling, &c. 5,314, Gibbons, means for preventing removal of locks. 5,945, Whitehead, device for regulating gas light from a distant position. 5,989, Thompson (*Karsten*), manufacture of incandescent mantles. 6,439, Dunbar, stave-dressing machinery. 6,452, Hailstone, covers for dust and slop carts. 6,512, Jeffery, burners for incandescent gas lighting. 7,491, Leroy, manufacture of imitation stained glass. 10,255, Edgeworth, gas-heating stove. 13,734, Murinick, incandescent gas burner for street lighting. 14,570, Haddan (*Bine*), self-closing valves. 16,307, Seifarth, artificial stone. 16,422, Sayer, kilns for bricks. 17,061, Commons, means of jointing wood with other materials. 18,759, Schroer, chimney tops also applicable for purposes of ventilation. 20,229, Shepherd, acetylene-gas generators. 20,263, Harvey and East, cowl for chimney flues. 20,795, Moser, combined fastenings and burglar alarms. 20,815, Loewe, locks. 21,074, Knopf, incandescent gas lamps. 21,192, Tidmarsh and Tidmarsh, spring-roller window-blinds. 22,853, Anderson, Thaw, Chalmers and Wright, heating and ventilating buildings. 22,914, Tidmarsh and Tidmarsh, outside window sun-blinds. 23,388, Dickmann, floor and wall coverings. 23,399, Percy Bacon and Brothers, Ltd., and Bacon, wall, ceiling and furniture decoration. 23,575, Weaver, waste fittings for baths and lavatory basins. 23,642, Reitz, appliances connected with incandescent gas-lighting apparatus.

1901.—75, Doyle heating apparatus. 408, Klingler, devices for holding open and closing windows, doors, &c.

Lord Chief Justice and Church Restoration.—The Lord Chief Justice of England went to Chatham last week and spoke at the Town Hall in aid of the fund which is being raised for the completion of the restoration of the Parish Church of St. Mary's, Chatham.

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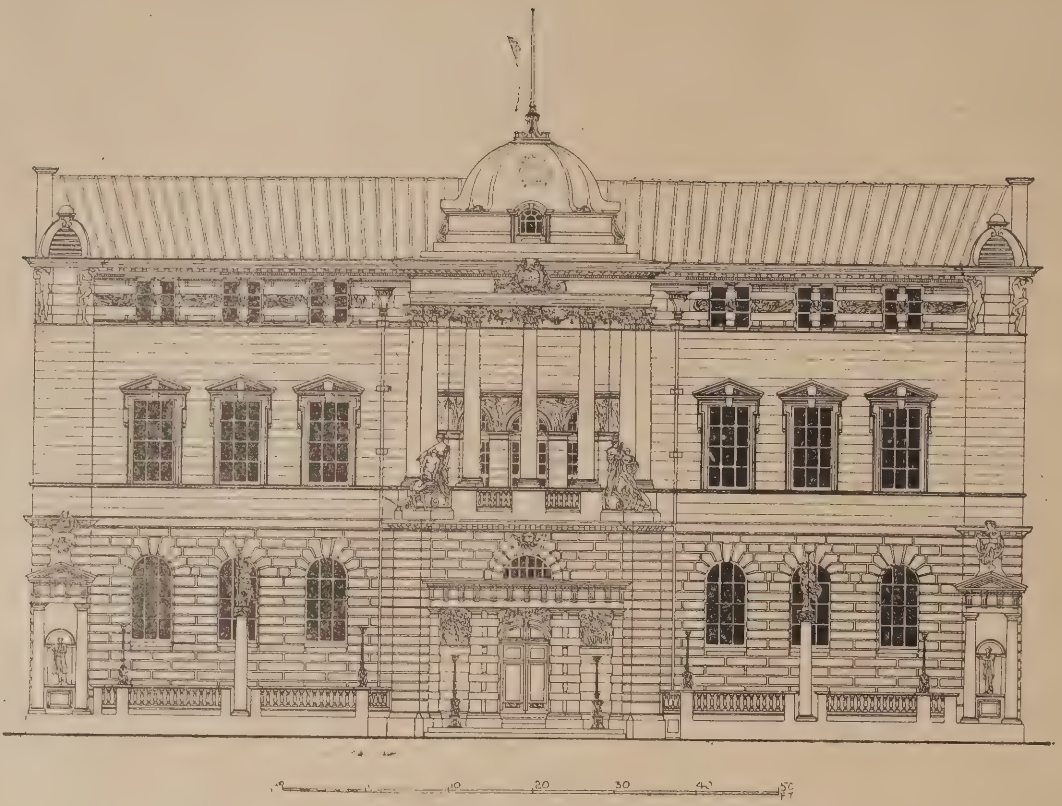
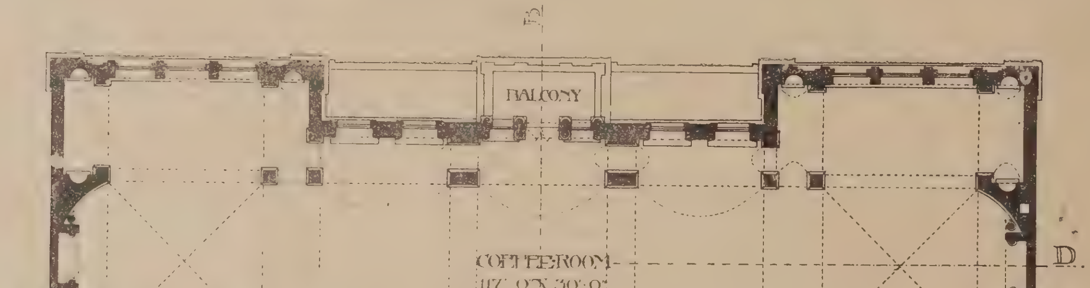


ENTRANCE FRONT.



·GROUND·FLOOR·PLAN·

R.I.B.A. SOANE MEDALLION COMPETITION. DESIGN FOR

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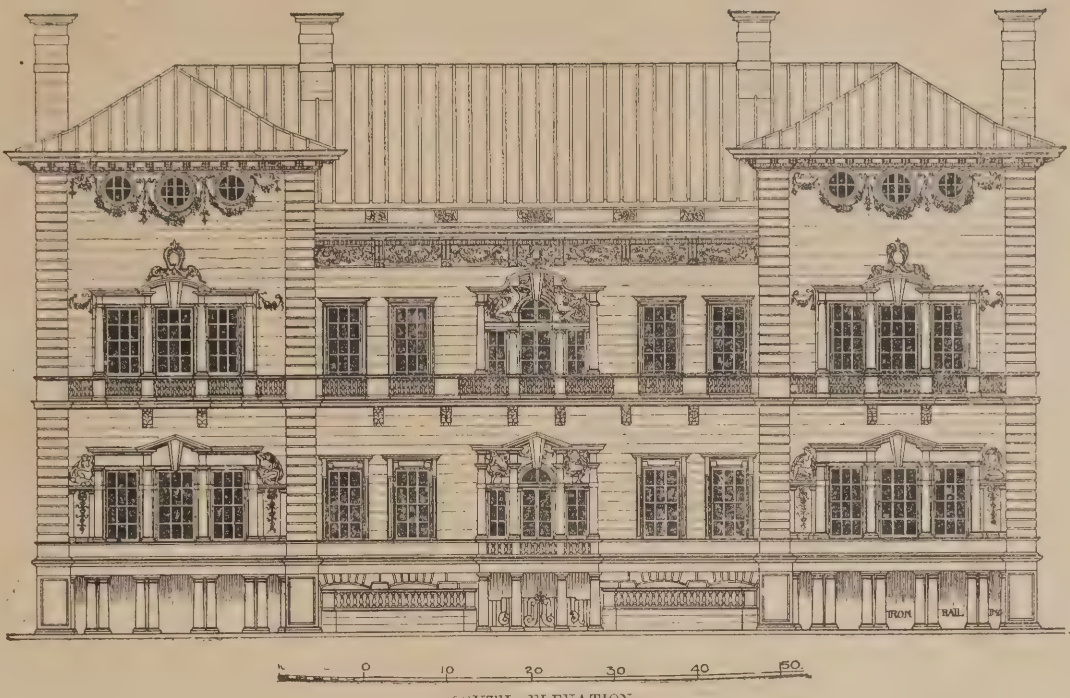
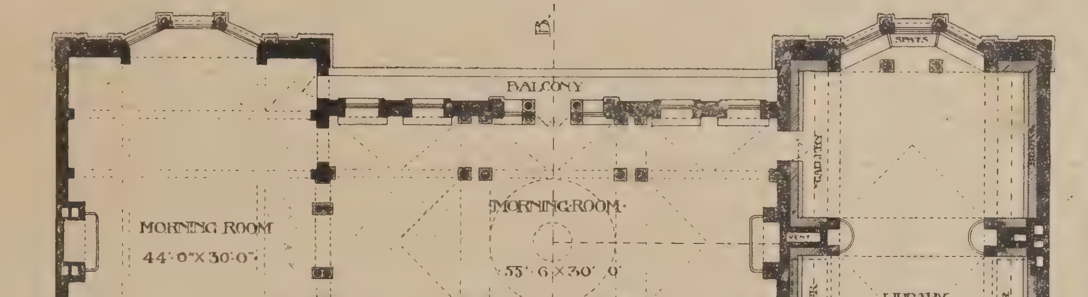


SOUTH ELEVATION.



FIRST·FLOOR·PLAN·

CLUB HOUSE IN A LARGE CITY. By M. J. Dawson.

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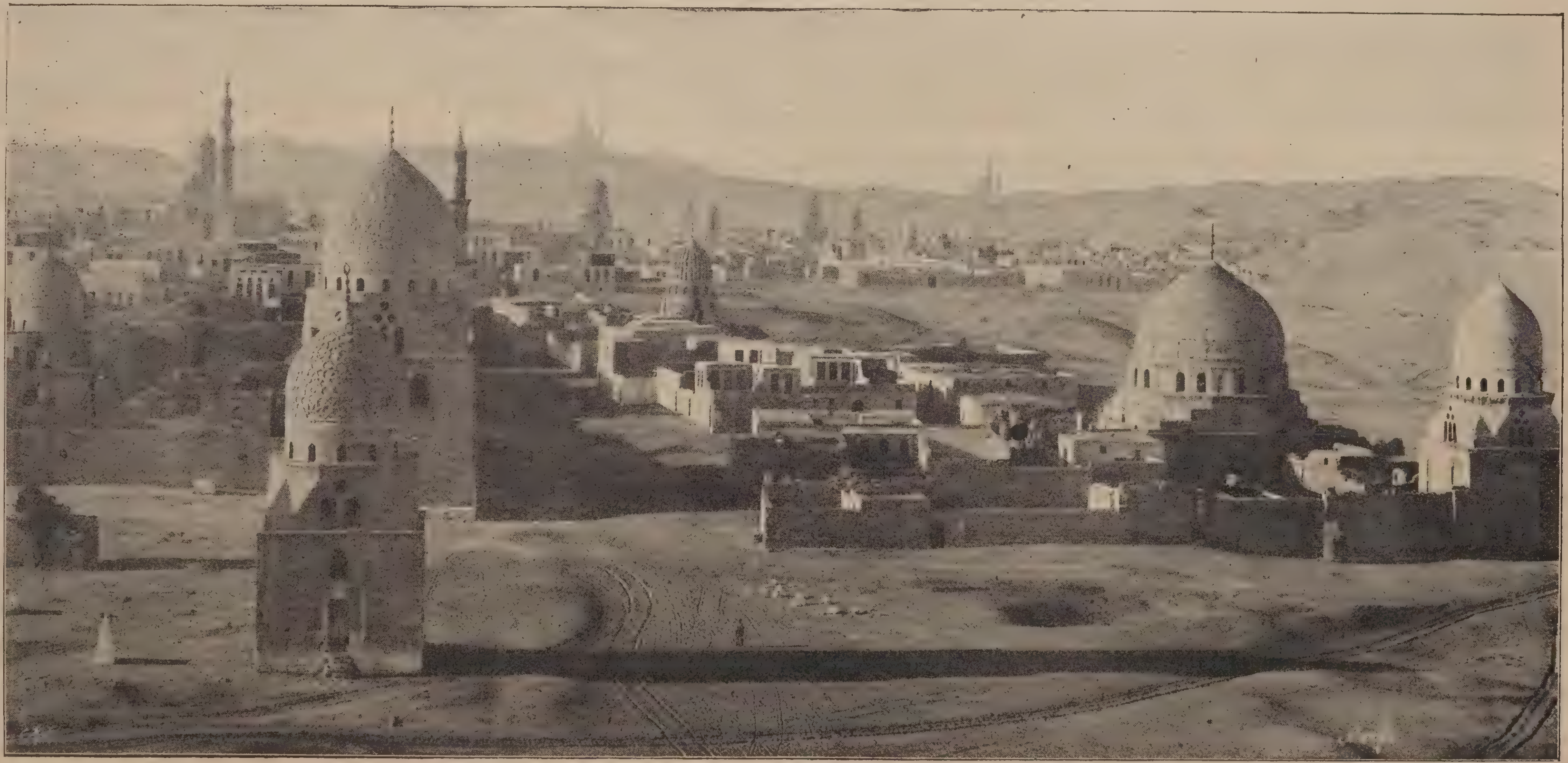

TOMBS OF THE KHALIFS, CAIRO.

(Illustrating Mr. Ronald P. Jones's paper on "The Saracenic Architecture of Cairo.")

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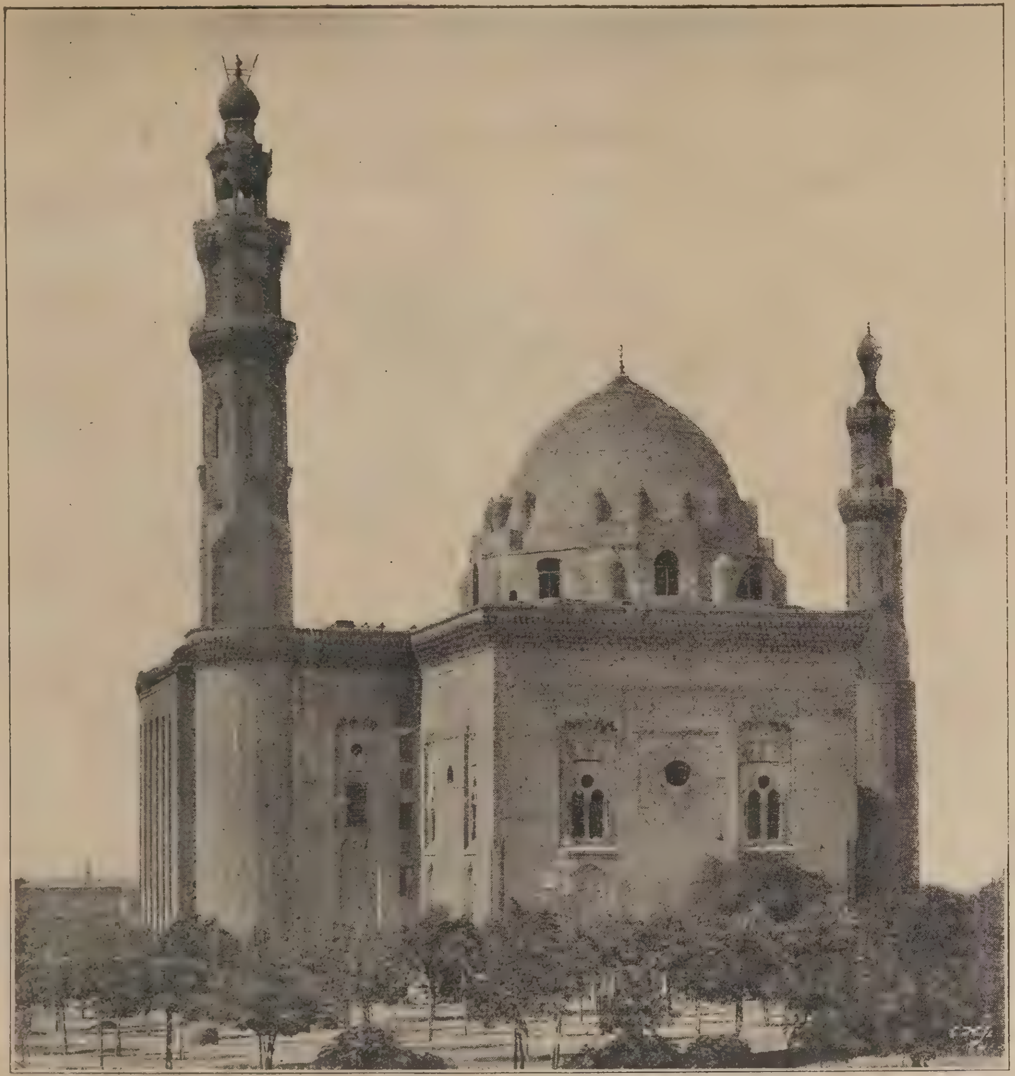
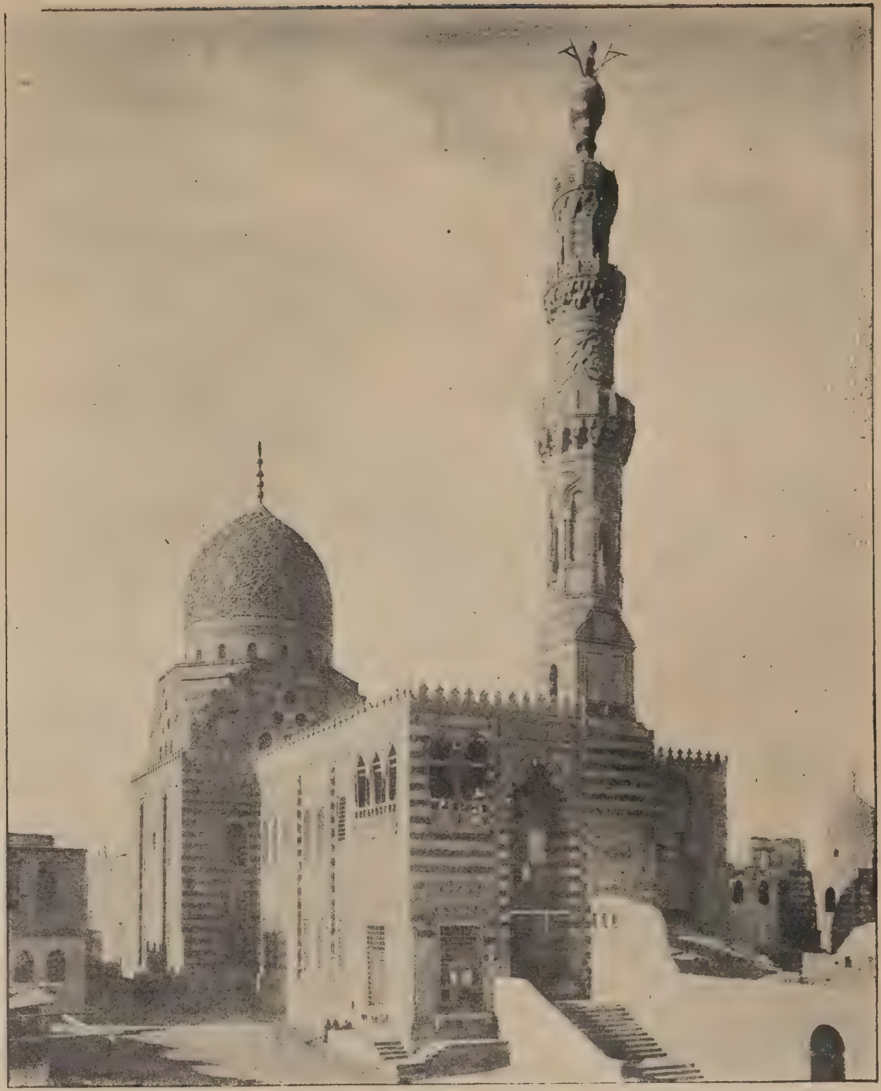
Wednesday, March 6th, 1901.



MOSQUE OF SULTAN HASSAN.



MOSQUE OF KAIT BEY.

(Illustrating Mr. Ronald P. Jones's paper on "The Saracenic Architecture of Cairo.")

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Bricks and Mortar.

APHORISM FOR THE WEEK.

Let each man exercise his best known Art.
ARISTOPHANES.

Our Plates. MR. RONALD P. JONES's paper on "The Saracenic Architecture of Cairo" begins on page 74 of this issue. As already stated in our columns, the Royal Institute did not award the Soane medallion and £100 this year, but an award of thirty guineas each was made to Mr. M. J. Dawson, Mr. J. Munro Cautley, and Mr. J. B. Fulton. We publish Mr. Dawson's drawings this week. Mr. Cautley's design was published in our issue for February 6th.

Stonehenge: Why the Stone Fell. THERE is very little doubt that the chief reason why the stone fell recently is because during the last year or two the number of visitors has increased immensely, and their standing round the stone gazing at the remarkable structure has caused the ground round the base to be trodden into a hollow, which, when the rains came, kept the ground in a sodden state. This continued softening of the ground was too much for the immense weight of the lintel on the top, and as the stones are only from 4ft. to 5ft. below the ground and from 16ft. to 22ft. above, the toppling over was a natural consequence; and if something is not done shortly to keep the visitors and picnickers out other stones are certain to fall.

A Roman Fountain. THE paroxysm of clerical prudery aroused by a fountain in Piazza Termini, Rome, has not been settled by the action of the populace in tearing down the hoarding which surrounded the figures of the much discussed Naiads. Don Prospero Colonna, syndic of Rome, was generally suspected of having, with practical good sense, arranged this farcical result to a foolish agitation. The clerical municipal councillors brought the subject before the Municipal Council in a discussion which became so stormy that the council hall had to be cleared of the public. The discussion ended with the adoption of a motion giving the Syndic discretionary powers with regard to the fountain, and was enlivened by an amusing speech from Signor Jacovacci, director of the Modern Gallery of Fine Art, on the subject of clerical qualms with regard to the nude in art. He asked what standard the [illegible] intended to set up, when one infallible Pope (Pius IX.) had ordered the figures of the angels in the monument by Canova to the Stuarts in St. Peter's to be covered for reasons of morality, and another infallible Pope (Leo XIII.) had ordered the covering to be taken away because the figures were in no sense immoral. The motion leaves the syndic of Rome power to consult artists not connected with the municipality before taking any action with regard to the fountain. Probably if such artists are consulted they will advise the syndic to leave the fountain as it is.

Mr. Gilbert's Lectures. CONTINUING his addresses at the Royal Academy last week on the sculptors of the fourteenth, fifteenth and sixteenth centuries (see p. 64 of last week's issue), Mr. Alfred Gilbert departed from precedent by referring to the work of a living artist, Mr. Watts; it would be sufficient to give the titles of two of his works, the bust of "Clytie" and the picture "Love and Death." While influences like this remained art would never die, and the students before him must think, too, of the influence their work might have on others, and try and help to build up a living art. When Gibson modelled his well-known statue, the "Tinted Venus," in Rome, he had it on reliable authority that he worked with six of the best models in the city posed in a row on one side of him, and with casts of all the pieces in existence of the Venuses of the antique, arranged on the other side. Knowing this, it was possible to understand why the "Tinted Venus" has somewhat of a conventional appearance. Mr. Gilbert urged the students to copy the casts in the schools of the Ilissus and the Theseus, though he knew they hated doing it. But those casts contained the highest beauties of the human form, and they were the best objects of study they could have. In his third lecture Mr. Gilbert dealt with the relationship of sculpture, architecture and painting, and the influence they had on each other. After he had discussed these matters and the close connection of the art of the goldsmith with that of the sculptor, the lecturer touched on the subject of the imaginary work of art, and also referred to masonry, "that degraded art now called a trade," moulding and pointing, among others. With regard to moulding he was sure he was right in insisting that the students should know something about it, for though you could always find moulders in a great city, it was not always easy to find men who would not spoil your work. In explaining pointing to them he would make practical use of the modern machine, but he would also show them the process by which the older workers were enabled to reduce or enlarge, simply by the use of three compasses. He urged the students when modelling to use both hands at once, to work on a definite plan, and to consider always the plastic nature of the clay they handled.

"Restoring" Rothesay Castle. RENOVATION is the rage in Scotland just now, says the "Daily Chronicle." Lord Rosebery has proposed—Mr. Andrew Lang protesting—to experiment with Linlithgow Palace. Now comes the announcement that the patching up of the ancient castle at Rothesay on the Clyde—suspended by the death of the Marquis of Bute, who was its hereditary keeper—is to be proceeded with. It is a pity. The oldest part of the building dates from 1098, and it has been the scene of many historical and legendary incidents in the national history. The excuse for the "restoration" is that the burgh is about to celebrate its quincentenary. It was constituted a royal burgh in 1400, and gave to the King, when he was Prince of Wales, his principal Scottish title, Duke of Rothesay.

The Gotha Observatory. THE destruction by fire of the old observatory on the Seeberg has brought to naught the plans formed by the late Duke Alfred for the restoration of that historic building. The observatory was erected by Duke Ernest II. of Saxe-Gotha and Altenburg in 1787-91, and owes its existence to a visit of the Duke to England. The erection of the observatory marked an epoch, for it was the first example of a style of architecture suitable for the purpose intended. It was built on natural ground, whereas up to that time people had erected observatories in towers which were very unsuitable for their purpose The transit instrument stood between two pillars of porphyry, each of which consisted of one block 9ft. high, 25in. wide, and 25in. thick.

The Wonderful Discovery of Greek Statues. "THE strange and indeed sensational discovery of works of ancient art at the bottom of the sea near the Island of Cerigo (Cythera)," says the Athens correspondent of the "Times," "will be regarded as an event of the highest interest by the antiquarian and artistic world. Statues of exquisite beauty belonging to the best period of Greek sculpture have been rescued from the dark, unfathomed caves in which they have lain for, perhaps, 2,000 years and restored to the admiring gaze of a distant generation. Many of them, unfortunately, have been much corroded by the salt water; in some cases the mischief is irreparable, in others it is comparatively slight, the portions of the statues embedded in the sand being still in excellent preservation. . . ." It is evident that a vessel containing a cargo of the choicest works of art must have foundered on the spot. Many of the statues and fragments have now been brought to Athens, where they have been deposited for the present in the Ministry of Public Instruction. Foremost in interest and beauty is the life-size bronze figure of a youth, apparently Hermes. The figure is poised on the left foot, the right being thrown backward; the right arm is extended, the hand apparently grasping a wreath or a sacrificial phial. The statue probably dates from the fourth century B.C., and may perhaps be attributed to Lysippos or his school; it would, therefore, be unique as a specimen of the bronze works of this epoch, our knowledge of which has hitherto been derived from copies only. It will, perhaps, be known to posterity as the Hermes of Cythera, or of Anticythera—the spot where it was found being nearer to the smaller island. "The ship in which it was conveyed, together with the other statues, was conceivably that in which the conqueror Sulla deposited many of the great masterpieces of Greek art. The vessel was lost, according to Lucian, somewhere in the neighbourhood of Cape Malea. The removal of the incrustation from the statues by means of chemicals will require the greatest care and caution, and the piercing of the fragments of the Hermes will be a still more delicate task. The restoration of this superb masterpiece, a task of the utmost responsibility, will no doubt be entrusted to an artist of world-wide reputation."

An Interesting Statement. MR. GEORGE MIDDLETON, of Bristol, puts another complexion on the discovery, for in a letter to the "Times" he says: "I find in the memoir of the life of my late uncle, Colonel W. Martin Leake, that in September, 1802, he (then Captain Leake), with Mr. William Richard Hamilton, Lord Elgin's private secretary, were engaged in bringing home the collection of Greek works of art belonging to Lord Elgin 'in a small coasting vessel' which had been hired for the purpose. They were directed to make for the Island of Cerigo, where Lord Nelson had directed a small transport to call for the purpose of conveying the marbles to England, but, unfortunately, 'the small coasting vessel' suffered shipwreck on the coasts of the island. She went down so rapidly that there was scarcely time for her passengers and crew to make their escape upon the rocks. With the assistance of sponge-divers from the neighbouring islands 'the chief part' of the marbles (? those in the British Museum) were saved, and now the remainder appear to have come to light, but they have been immersed for less than the 2,000 years (!) that your correspondent imagines."

Old Halls in Wirral. AT a meeting of the British Archæological Association held on February 20th, Mr. S. W. Kershaw, M.A., F.S.A., presiding, an interesting paper on "Some Old Halls in Wirral" was read by Mr. W. Ferguson Irvine. The hundred of Wirral possesses many special characteristics, due mainly to its peculiar surroundings and situation. Wirral, or "Wurrall" as the old natives call it, is the tongue of land lying between the estuaries of the Mersey and the Dee. The halls and manor-houses differ in many respects from the rich examples of domestic architecture for which Cheshire is so celebrated. One peculiarity about them is the half-timber construction, which is confined entirely to the frontages, the rest of the walls being of masonry. In Bidstone Hall there is a good specimen of the style of architecture of the early seventeenth century, the house being built in 1620-22. In the deer park is still standing an old wall more than 6ft. high and about 4ft thick, built of rough stones, which is referred to in almost every lease of the hall as far back as 1609 as "the great stone wall"; its antiquity may be much greater, as tradition records it was built when wages were a penny a day. The wall is popularly known amongst the villagers as the "Penny-a-day dyke." Chief amongst the buildings described and illustrated were Leasowes Castle; Storeton Hall, connected with many memories of the historic house of Stanley, dating from about 1360 and architecturally a good example of the fourteenth century; Shotwick Hall and the partly timbered houses of Irby, Hooton and Plessington. None of these old halls can boast of having been the residence of a king or queen, yet the histories of many of them, as told by the lecturer, were romantic and interesting.

Builders' Notes.

Mr. William Sharp, builder, of Poole, died recently at the age of 65 years.

The Plumbers' Technical Schools at Lincoln are to be reopened, and they will be worked by a committee consisting of equal numbers of masters and operators.

Mr. William Jackson, painter and plumber, died recently in his 56th year. Deceased was for some time a member of the Kendal Burial Board, and also a prominent Oddfellow, being connected with the Nelson Lodge of the Manchester Unity.

"Portland" Cement from Abroad.—The law recognises a fine distinction between inaccurate "trade" names which deceive the public and those which do not, and now a protest is to be made against the purchase of "Portland" cement from abroad. Colonel Tufnell intends to represent to the Admiralty and the War Office that although Portland cement may not come from the south coast station after which it is named, the Government could at least give the orders at home and not invite tenders from abroad.

The Building Trade at Hemel Hempstead and in the locality is slack, but an estate—the Manor Building Estate—of some 200 acres near Boxmoor Station for residential and shop property is being laid out for sale in the spring. Messrs. G. B. Kent and Sons, Ltd., brush manufacturers, have secured a site at Boxmoor, and are about to build a large factory, which should improve things; whilst a motor-car should facilitate accommodation for travellers to the old town, but new borough, of Hemel Hempstead.

London County Council. — The housing question was the main subject of discussion at last week's meeting of the Council. The report of the Housing of the Working Classes Committee dealt with the Reid's Brewery site, Clerkenwell, the Tooting estate for cottages, and the Lordship Lane estate, Tottenham; particulars of the latter were given on page 62 of our issue for last week. Mr. D. S. Waterlow, chairman of the committee, in reply to questions, said they had displaced 13,179 persons and arranged for the rehousing of 14 516. Mr. Harris maintained that 16,000 had been displaced and only 10,526 rehoused. Mr. Waterlow retorted that this number included those displaced by the old Metropolitan Board of Works. Mr. Goulding, M.P., complained that the lowest rents of the cottages at Tooting would be, with daily tram fares, 7s. 6d. to 8s. 6d. per week for two rooms. The portions of the report referring to the proposed schemes were postponed.

Cement in Egypt.—In 1899 the quantities of cement imported were 292,500 casks value £104,700 E., as against 57,500 casks, in 1890, representing a value of £22,700 E. This considerable increase is due to the industrial and agricultural development of Egypt. The various hydraulic works, the construction of factories and dwelling-houses, necessitated the use of large quantities of cement. Cement has to be used for the foundations of houses, owing to the dampness of the soil. It is also employed for pavements and floors. England and Belgium are the chief suppliers, but the various Government departments usually place all their orders in England, which sends over chiefly Portland cement in 300lb. casks. Of late there has been a marked advance in prices. A cask of English Portland cement costs from 7s. to 8s. Belgium sells at lower prices than these, a 150 kilo cask costing 5·25frs. f.o.b. Antwerp, *i.e.* about 47frs. per ton c.i.f. Alexandria. France and Germany supply small quantities; Austria-Hungary does very little, but Italy's trade has increased considerably. The demand for cement tends to increase more and more in Egypt. Very large hydraulic works are now in progress at Assouan and Alexandria.

The National Association of Master Builders held its half-yearly meeting in London recently. The chair was occupied by Mr. Krauss, who was appointed chairman for the ensuing year. The Scottish Federation was represented by Messrs. Lamb and Selkirk, who informed the meeting that their federation wished to form a sort of working agreement with the National Association. The question was referred for further consideration at the next half-yearly meeting, which will be held at Glasgow. Several financial questions were referred to a Finance Committee, with instructions to present a report at the Glasgow meeting. These included resolutions in favour of clearing off a small adverse balance, preparing a scheme to raise ways and means for the purpose of forming a reserve fund to carry on the epecial work of the society, appointing an organising secretary for the United Kingdom, placing all local societies on an equal basis and joining the Employers' Parliamentary Committee. It was reported that the negotiations for affiliating with kindred associations were making satisfactory progress.

Fire Tests with Doors.—We have received a copy of No. 50 of the publications issued by the British Fire Prevention Committee. It deals with a fire test made with a $2\frac{3}{8}$in. door of Archangel deal constructed in three thicknesses and a $1\frac{5}{8}$in. teak door flush-panelled on each side, the panels being in two thicknesses. The test lasted 71 minutes and the door openings were approximately 3ft. by 7ft. The following in a summary of the effect:—In 16 minutes flame appeared over the top of the teak door; in 53 minutes the whole of the top rail of this door was alight, flame also appearing between the joints of the lower panels and muntin; in 53 minutes flame appeared also on the outside of the deal door through the vertical joint between the boards in the centre of the door just above the sill; in 58 minutes the west portion of the top rail of the teak door fell; in 65 minutes the greater part of this door fell, leaving the east stile, part of the west stile, and the bottom rail in position, though much burnt; in 66 minutes a hole about 6in. square was burnt through the deal door in the centre just above the sill, and also a small hole near the top. There was no other sign of damage on the outside, and at the conclusion of the test this door remained in position. It was afterwards found that the two inner thicknesses were practically gone. The teak door had been condemned by a district surveyor as not complying with the Building Act, the panels being constructed in two thicknesses and the total thickness being insufficient. From the foregoing it is seen that the deal door withstood the test much better than the teak door.

"The Outlook for the World's Timber Supply" was the subject of a paper read before the Society of Arts last week by Dr. W. Schlich. He gave statistics showing that in the importing countries of Europe there was a nett increase of 600,000 tons yearly. Great Britain, Germany, and Belgium were responsible for the largest consumption. All authorities agreed that Norway and Hungary were overworked, and that the exports from the forests would cease within a measurable time. Russia, with its enormous forest acreage of 516,000,000, would require all its timber for home consumption when its population reached 150,000,000. The exporting countries of Europe fell short of the annual demand by 240,000,000 tons, which deficiency would in ten years' time be doubled or trebled. What could the non-European countries do to help us? China and India would not be able to export much timber, as it would be required for home consumption. When China trade was opened up it would require large imports, which it would probably derive from the United States and Canada. Though there were 700,000,000 acres of timber in the States it could not maintain the demand which Europe was making upon it. At present the annual consumption was in excess of the annual growth, and if it continued unchecked the result would be bankruptcy. Happily, the United States Government were alive to the danger, and they had founded three Faculties of Forestry in the Universities. The number of fires had been reduced by the appointment of forest rangers, and the selection of reservations. Canada also had been unable to meet the European demand, notwithstanding its vast acreage. Finally, it was pointed out that some seven or eight million tons of timber were annually converted into pulp for the manufacture of paper. This was a serious menace to the production of coniferous wood in the world.

CHIMNEY STACKS.

BY ROBERT W. CARDEN, A.R.I.B.A.

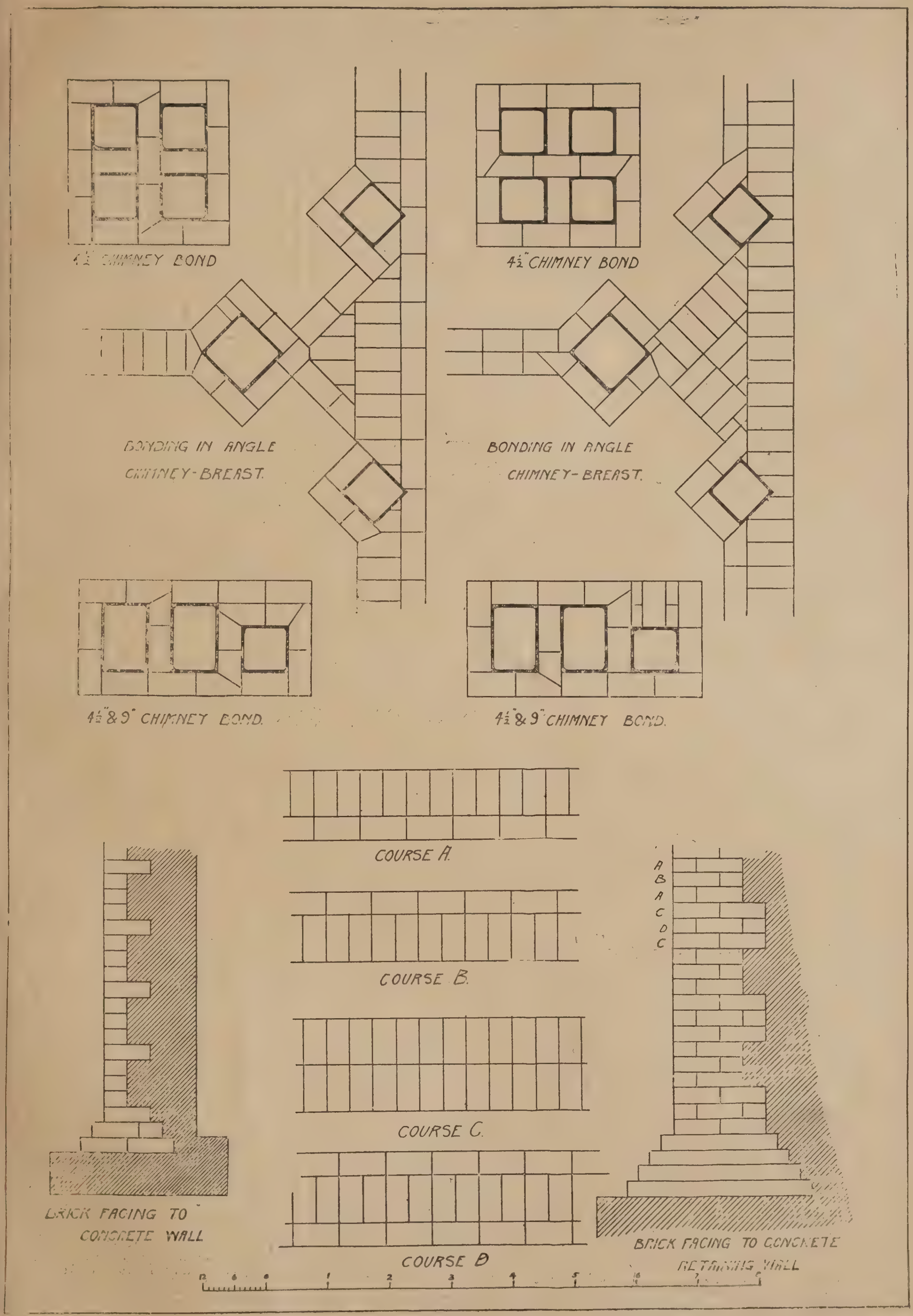
THE construction of a chimney stack, although one of the smaller details of house building, is nevertheless one which has very much to do with the comfort or otherwise of all. It is the general custom to build these with walls only half a brick in thickness, a practice which has two distinct disadvantages, while there is only point in its favour, which is, the trivial advantage of saving the cost of a few bricks. The disadvantages are (*a*) that there is only a thin layer between the flue proper and the external air, and that consequently the flue is chilled and the up-cast of the draught lessened; and (*b*) that there is great difficulty in obtaining anything like a semblance of bond. Skew-cutting is generally necessary in every course (as shown in the accompanying illustrations), but even to this there would be little objection if one could only be sure that the bricklayer would cut each brick carefully and perfectly true to the required angle. But, unfortunately, most of us know the haphazard way in which the generality of bricklayers cut their closers or skew-backs for internal and unseen work, and what little bond might have been obtained by this device is rendered ineffective through careless cutting. Given a conscientious and capable bricklayer and a flue lined with special flue-pipes, there is little objection to the half-brick stack. But the safest plan in all cases would be to have walls one brick thick, for there would be no difficulty in obtaining bond, and the extra cost of the bricks would be in part paid for by the elimination of the cutting, which is charged for, if not supplied.

The adoption of angle fireplaces very often solves a difficulty of planning as far as the architect is concerned, but the matter is entirely different when we realise as the work proceeds what an enormous solid triangle of cut brickwork has to be paid for by the client. This is clearly demonstrated by the illustrations given of two alternate courses showing two 1ft. 6in. chimney openings and three flues, two of them 9in. by 9in. and the other 11in. by 11in. (equivalent to a 14in. by 9in.). Neglecting the considerable amount of cube brickwork required, there is more than 5ft. run of splayed cutting in each course, whatever scheme of bonding may be employed. This all has to be paid for, and if the architect always thought of the expense he was incurring in adopting this solution of his difficulty there would probably be fewer angle fireplaces shown in the plans of future buildings.

Concrete walls with brick facings do not require much notice. The wall is built up in heights of 12in., the brickwork being built first, the framing at the back secured *in situ* and the concrete thrown in, and so on with each succeeding portion. The brick bonding may be one of two types: three courses of stretchers and one course of headers, or three stretchers and one header alternately in each course, the headers in one course being placed alternately between those in the course below.

A new Infectious Diseases Hospital for Southport.—A Local Government Board enquiry was held recently into an application of the Southport Town Council for compulsory powers to purchase a site for a new infectious hospital in the township of Scarisbrick, and also for power to borrow £30,000 for hospital purposes.

The Great Crucifix at St. Albans Abbey which Mr. Harry Hems and his sons were commissioned by Lord Aldenham to do for the high altar screen, is the largest sculptured representation of the crucified Christ in England. Mr. Hems formed his conception from the story in Mr. F. Marion Crawford's novel "Marzio's Crucifix," and the novelist has written to Mr. Hems congratulating him on the work.



BONDING CHIMNEY STACKS.

ARCHITECTURAL ASSOCIATION.

THE PARIS EXHIBITION OF 1900.

BY E. W. M. WONNACOTT.

A MEETING of this Association was held last Friday evening, Mr. W. H Seth-Smith, president, in the chair. Messrs. D. Hill and A. Gilbert Scott having been elected members, Mr. Wonnacott, who won the studentship prize offered by Mr. Arthur Cates, F.R.I.B.A., for giving facilities to visit the Paris Exhibition, read his paper, of which the following is a summary:—

Every eleventh year France, since 1855, has invited the nations to come and vie with her in the great industrial shows she initiated. The exhibition of last year was long foreseen, but it nevertheless was decided on in a hurry, for Berlin had intended to close the century with a magnificent universal exhibition there, but France, ever jealous of her next door neighbour, sailed in a point nearer the wind, and bespoke the date mentioned. Whichever nation it was that was to have the honour of holding the international show, there was the opportunity of closing in a magnificent way the century of artistic, scientific and commercial enterprise that has not yet been equalled in the world's history, and at the threshold of a new century era, to open the door to unknown possibilities.

Perhaps it will be well to mention here that there is now a feeling—almost universal—that these international exhibitions are being held too frequently, and one feels quite gorged with them. It would be better to have them forty or fifty years apart, in the same territory, those in the interval being held by the rival nations.

Having fixed the date so early as 1892, we see it took six years to progress to fruition. The services, staff, &c., were settled in 1893, the site decided on in 1894, and the regulations and rules promulgated in 1896, leaving four clear years, in which were to be brought forth the designs (in competition or otherwise) and the erection of the buildings themselves.

It was left to M. Alfred Picard, inspector general of roads and bridges, the official reporter of the 1889 show, to draft the preliminary ideas of the 1900 Exhibition. On the general lines laid down by him (which included for the first time the right bank of the river or the northern side), a competition for the supply of ideas was initiated in which 108 competitors entered. Parliament voted a credit of 100,000 francs for the purpose. The competitors were at liberty, by the conditions, to raze everything within the selected boundaries, except the Palace of the Trocadero and the Eiffel Tower. The majority of the competitors favoured the opening up of a new avenue from the Champs Elysées to the Invalides, which would entail the destruction of the Palais de l'Industrie, a relic of the 1855 Exhibition. Round this scheme raged a hot and angry discussion, but eventually it was decided to adopt it, and the avenue (now known as the Avenue Nicholas II.) was almost an accomplished fact. Singularly enough, towards the close of the eighteenth century, the same thing had been talked of by Gabriel, the well-known French architect of that time, when he proposed to shave off the top of the rising ground where now stands the Arc de Triomphe, and to make various extensive improvements in this quarter of Paris; the murmurs of the approaching Revolution postponed the accomplishment until our own day.

Then came the second competition, in 1896, for the arrangement of the Exhibition buildings. M. Picard having decided on the knotty problem of how to provide, on almost the same site, as regards size, as the 1889 show, about triple the area of galleries for the 1900 one. The idea being already adopted of an avenue terminating in the Invalides, with a palace on each side of it, next the Champs Elysées, the jury selected nine schemes for the large palace and eight for the small. A final ballot brought out the name of M. Girault as architect for the Petit Palais, while for the Grand Palais were selected (1) M. Louvet, (2) MM. Deglane and Binet, and (3) M. Thomas. Eventually these were associated together in the design and construction of the Grand Palais (except M. Binet, who received as consolation the commission to erect a monumental gateway at the principal entrance of the Exhibition). The architects who were placed second in the competition for the Petit Palais were commissioned to execute the architectural decorations of the new bridge, forming the connecting link between the Champs Elysées and the Invalides. MM. Casssien Bernard and Cousin, the architects referred to, were to work hand-in-hand with the engineers already appointed, MM. Resal and Alby.

The staff—the architectural department—worked under the direction of M. Picard. This was housed in a fine red brick building or pavilion, with offices on the Avenue la Bourdonnais.

Finance.

Perhaps a word or two on the financial aspect of a great exhibition may not be without value. In 1867 the State and Town furnished a subvention of 12 million francs and a Guarantee Corporation had 6 millions more in hand, but was not called on to pay, there being a balance on the right side.

In 1878 the State, jointly with the town, executed the operation, and there was a deficit of 20 millions, but of this sum 10 millions went to pay for the Trocadero. But that of 1889 resulted quite otherwise, and the surplus of receipts over expenditure reached the respectable total of 8 million francs.

The 1900 Exhibition, of which the official accounts have been already published, results in a deficiency of over 2 million francs, but this applies to the official work only. There are in addition the unofficial shows also to consider; 670 projects were submitted in the preliminary competition, sixty of them retained for the final selection; they had to pay extortionate rents for their ground space, and were moreover over-capitalised; many of them closed their doors early in the summer. The total amount of capital raised for these unofficial shows was 46½ million francs, nearly £2,000,000. So we see much money was sunk by the concessionnaires, and nothing was reaped from it.

So also in the case of the Exhibition bonds, the only means of raising money to float the Exhibition at all. Over three million pounds were easily raised by the French bankers by means of £1 bonds, which were greedily snapped up by the public; but they were practically given away, for each bond carried the right of twenty one-franc tickets for admission, a reduction of 25 per cent. on certain of the side shows, and participation in the drawings of the lotteries, the latter being the only prospect of remuneration on the outlay.

Works and Construction.

The wreckers (those wolves of the architects, as they have been called) and the navvies were looked after by a Committee of Hygiene. All the immense masses of earth that were moved, whether in foundations, road or tramway cuttings, were profusely sprinkled every day, when work ceased, with pulverised sulphate of iron 100 parts to quicklime 200 parts to every square mètre. This precaution to us may seem absurd, but it must not be forgotten that Paris is a very insanitary city, and still abounds everywhere with hidden cesspools and middens. A strong staff of inspectors were told off for this purpose of special service of sanitation.

Demolitions.

I have no data of the cost of demolishing the structures that formerly stood on the site of the late Exhibition, but I may mention that the old Palais de l'Industrie was removed for the sum of 200,000fr., only the colossal group that crowned the structure, by Elias Robert, being preserved. The dome, the Dome Centrale on the Champ de Mars site, cost 20,000fr. to pull down and the Pavilion of the Town of Paris—from the last Exhibition—20,000fr. Besides these, there were razed the Palaces of the Fine and Liberal Arts, but I have no items of costs. It is estimated that it would cost, to remove the old Galerie des Machines 1,000,000fr. if decided on.

Workyards.

The contractors' yards for heavy material were laid out in a most methodical manner, amply provided with tramways and railways, cranes, hoists, and everything desirable to facilitate despatch: and despatch was the order of the day, there being only four years to complete. The daily labour roll amounted to over 5,000 hands, in spite of the fact that everything that could be fitted together before arrival on the site was so done. There were twenty-three of these workyards, each under an architect, in some cases under two architects.

Stone.

The stone most largely used was the calcaire grossier, a white freestone largely found in the Paris basin; from the quarries of Château Landon, near Nemours (Seine et Marne), as was used for the Arc de Triomphe; also the stone from the Aisne and Oise Valleys, as the new Louvre; those of Charentenay and Courson (Yonne), as we see in the Hôtel de Ville. The ashlar work of the Petit Palais was a hard freestone from Coutarnoux (Yonne) up to the first band, and above that a freestone from Méry. In the Grand Palais, where there were about 40,000 tons (French)—17,000 cubimetres—used, the lower part was from Villebois, and was the only example I could trace of a quarry-worked stone. All the rest was cut and worked on the site, the freestone being from Euville, Lerouville (Meuse), and Larrys (Bourgogne) for the *socle*, and from Villers, Adam and Vic sur Aisne. We also see pink mottled limestone from the Côte d'Or, or Burgundy, employed in decoration and pilasters, similar in appearance to our Devon limestones. Also grey granites from Calvados, white and golden yellow freestones from Poitevin sources, and the valley of the Oise.

Stucco.

But the material most profusely used throughout the Exhibition for the temporary buildings was the stucco or "staff"[*] applied over the light wood or iron skeleton of the structures on fireproof lathing or wirework. As most of the buildings were temporary, they were executed almost wholly in this way. This "stuc" (the use of which we can readily trace back to the days of the Romans) was very largely used in the seventeenth and eighteenth centuries, and is now the universal material used by speculating builders in Paris for the vestibules, staircases, entrées, &c., and an old example can be seen by the curious in the Presidency of the Chamber of Deputies, where the stuc was coloured; the work was by Jules de Joly, then architect of the Palais Bourbon.

Ciment Armée.

Then there was the ciment armeé, or concrete with steel cores, used in large masses, profusely used in nearly all the buildings, whether permanent or temporary, especially for staircases and landings, and galleries of wide span.

Steel.

But looking back over the century just passed, the material that has come most to the front is steel. At the opening of the nineteenth century iron construction was unknown except in the form of cast girders and occasional roof trusses, either wholly or partly in iron. But the succeeding years bring us by rapid strides, through the demand for high and wide buildings, and fireproof ones, and the commercial use of the steel process, past such landmarks as the Crystal Palace of 1851, and the Gare St. Lazare, in 1867 the elliptical exhibition building, in 1878 the Machinery gallery, trusses without tie rods, of 110 metres span, by the eminent engineer De Dion, outvying our own St. Pancras Station, in 1889 the Eiffel Tower, 300 metres high, and the far-famed Forth Bridge. In 1900 steel had become almost the universal material for the frame of structures, even if temporary.

An example from the statistics will show the great economy effected as the result of previous experience, gained in the former exhibitions. In 1878 it cost nearly 5fr. per cubic metre to erect the steelwork coverings; in 1889 this was reduced to 2·77fr., while in the recent Exhibition I am assured the figure barely reached 2fr. per metre cube.

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[*] "Staff" is a variety of fibrous plaster, cast in moulds, used only in thin sections applied over the surface of the works.

Foundations in Bad Ground.

A singular process was employed in the marshy part of the Exhibition site, where the ground was soft and spongy — that was, mechanical compression, in which a steam pile-driver was first used to perforate the ground down to a hard bottom, then to enlarge the bottom of the hole thus formed, and finally to beat down and consolidate the concrete thrown in to form the foundation, forming a large concrete pile standing on a kind of mushroomed foot on the hard bottom. This avoided the necessity of removing large masses of poor soil, and gave at the same time a stable substructure for the subsequent erections.

Estimates.

A word on the system of estimates prepared by the architects for the builders. Instead of pricing a bill of quantities, as with us, and the job going to the lowest tenderer, the architect, or his surveyor, gives in his estimate at a given figure. Invitations are then sent out to the contractors, and the game then is to find out who will give the greatest rebate below the already quoted price.

Design.

As regards the buildings collectively, one must regard this Exhibition as a spectacular achievement, an architectural fairyland; and one can overlook the faults of too exuberant, or fantastic detail, and similar things, bearing in mind that these productions were for a festal occasion, and festive they undoubtedly were: great was the variety of form and mass, extraordinary originality and vitality were displayed in the details and decorations, while most vigorous was their execution. Picturesqueness was supplied by the row of foreign pavilions on the river bank, the Château d'Eau and the gardens of the Trocadero, and other parts of the Exhibition, while dignity was worshipped in the symmetry displayed in the vistas of the Champ de Mars and the Esplanade des Invalides. All this combination was entirely due to the genius of the French architects and their unique methods of training.

Plan.

The Exhibition was laid out on four main sites, two on each bank of the river, with connecting strips bordering immediately on the river itself; but these four sites fall into two groups, each of which consisted of a piece of ground on one side of the river connected with another similar plot on the other by means of a bridge, which formed the axis of each group. Thus we have the Champ de Mars—the largest of these four plots—connected with its opposite neighbour, the Trocadero Gardens, by the Pont d'Iéna. Similarly we have the Esplanade des Invalides joined to the Champs Elysées portion by the magnificent Pont Alexandre III. Then these two groups were connected themselves by narrow enclosures or strips of ground on the banks of the Seine, as the Rue des Nations on the left bank (the Quai d'Orsay) and the Rue de Paris and the Old Paris on the right bank. But the axes of these two groups were inclined to one another, almost meeting on the south side and diverging to the north on the large bend made by the river between the two bridges above named.

The area of the site covered was much more than in previous exhibitions, and amounted to 112 hectares, including the overflow site in the forest of Vincennes, allotted to the railway and heavy machinery exhibits.

At the main entrance, overlooking the Place de la Concorde, was the Porte Monumentale, the principal entrance (of 45 in all) that gave access to the grounds. This was designed by M. Binet. A broad walk ran parallel to the river, bordered by statues, sculptures, and horticultural exhibits, leading to the magnificent Avenue Nicholas II. and the new bridge, the Pont Alexandre III., and on the right are the two Palaces of the Fine Arts, the one known as the Petit Palais (although itself an immense structure), and facing it on the other side of the Avenue the Grand Palais, the rear of which abuts on to the Avenue d'Antin. These features —the two palaces and the bridge—are intended to be permanent embellishments of the town of Paris. A narrow enclosure between the Cours de la Reine and the river, known as the Rue de Paris, contained chiefly the large pavilion of the town of Paris, by M. Gravigny; the Palace of Horticulture, with its aquarium in the centre; and the Palace of Congress and Social Economy. Each of these structures bordered on the river, and on the other side of the Rue de Paris was a miscellaneous crowd of small shows. A footbridge by the Pont de l'Alma led into the picturesque portion known as Old Paris, also bordering on the river, and emerged on the large garden of the Trocadero, where were situated the French and foreign colonial exhibits. From the Palace of the Trocadero looking south to the Champ de Mars, was the Pont d'Iéna, and opposite the Eiffel Tower; beyond it the Champ de Mars, flanked on either side by a range of palaces, and at the end the vista was closed in by the Château d'Eau and the Palace of Electricity. At the rear of the last-named is the old Galerie des Machines, still standing, and now very much transformed.

The Champ de Mars is connected with the Esplanade des Invalides by the Rue des Nations, where was the most picturesque spectacle of the Exhibition, the row of foreign pavilions abutting on the river, destined to be wiped out of existence by the time I am addressing you, although a few of them are to be re-erected in various parts of the world. On the same bank of the river, before entering the Street of Nations, were the Palaces of Forestry, Navigation, and that of the Land and Sea Forces.

Then coming to the Esplanade des Invalides, we find, as on the Champ de Mars, two parallel ranges of buildings devoted entirely to the decorative and industrial arts, the avenue between these two rows being a continuation of the Avenue Nicholas II. and the Pont Alexandre III., and terminating southwards in the fine vista of the Hôpital des Invalides. It is in this portion of the Exhibition that the buildings were designed on a high artistic level; the façades were very fine, the masses happily grouped, and the details, if somewhat exuberant, were extremely suitable, and *tous Français.*

Le Grand Palais des Beaux Arts.

This building, on the largest and most monumental scale, was, during the Exhibition, the home of the French and foreign displays of the fine arts: painting, sculpture, and architecture; but it will remain as the permanent home of the annual French Salon, and possibly will also be used as the locale of many Government fêtes and displays. The building is of immense size, covering nearly ten acres; its plan resembles the letter H. The commission for this was given to three architects, who worked together most cordially in its production and so successfully treated the various portions as to make them appear one great building externally. The front portion, that facing on the Avenue Nicholas II., was entrusted to M. Deglane, who was responsible for the immense façade and the great hall or "nave" forming the sculpture hall. M. Louvet executed the central portion, forming the link between the front and rear with the grand staircase, "l'Escalier d'Honneur," for ceremonial use, leading to the concert rooms and picture galleries on the first floor. The rear portion was allotted to M. Albert Thomas, comprising the front facing the Avenue d'Antin, a large central hall covered by an elliptic dome, and the wings.

The cost of this was estimated at 25,500,000 francs. The foundations, over 550,000 francs, were put in with great difficulty, as a portion of the site was a mere marsh, with beds of peat and clay; part of the palace is therefore constructed on oak piles, and part on concrete bedded on a sandy clay. The stonework, 40,000 French tons, in a brilliant white freestone, the calcaire grossier, was all cut on the site by a diamond saw, fed by a ten-ton traveller, running on rails. Stone was exclusively used on the external fronts, but the inner walls were of rubble and brick, faced with stone. Ciment armé, *i.e.* cement concrete strengthened with steel wire of large gauge, has been largely adopted for the staircases and galleries. Then for the roof were used about 6,000 tons of steel, executed by Daydé and Pillé, of Creil. I was informed the strains have been so carefully calculated that the resultants pass through the points of support, thus relieving entirely the masonry construction forming the enclosing screen walls of the palace.

M. Deglane was obliged to alter and modify his first conception in order that the Petit Palais, facing it, should not be overpowered by its more important neighbour. But the glory of the façade was retained in the glass mosaic frieze, about 250ft. long, designed by M. Fournier. The immense nave, or sculpture court, 200 by 55 mètres, is under one great glass roof, the central part being dome shaped, of about 230ft. diameter, carried on curved principals formed as box girders, grouped in pairs, and decoratively treated with wrought iron scrolls and ornaments.

The intermediate part, by M. Louvet, or bridge of the H, comprises a return of the *nef*, and the staircase of honour, with two short façades on the north and south sides respectively each 65 mètres long. M. Louvet had a knotty problem to settle when asked to provide for exhibitions of all sorts: the ground floor being intended for the Concours Hippiques, and equestrian performances, for sculpture and various art exhibitions; the first floor for picture galleries, and a salon d'honneur; and the basement for stables and stores; while his staircase of honour, besides being the principal means of access to the upper storey, was to be the grand decorative feature of the interior. Moreover he had to arrange this portion as a complete whole, with its own entrances, stairs, lift and service, so that it could be used for functions quite apart from the Great Hall in the rear block. At the head of the wrought-iron staircase, sumptuously gilded, is the great concert-room, for 1,500 persons.

M. Albert Thomas, who did the rear portion of the great palace, had a fine opportunity, and has produced a very fascinating work. It comprises a rectangle of 150 mètres by 45 wide, covering nearly 7,000 square mètres, with an important façade on the Avenue d'Antin, set well back from the frontage, and raised about $4\frac{1}{2}$ metres above the roadway, giving a well-lighted basement to be utilised as stables during the horse competitions, with room for 600 horses, and accommodating also all the auxiliary services of this vast edifice.

A large hall, nearly circular, forms the central feature on the ground floor, being about 29 mètres diameter and 34 mètres high, top-lighted, and of great beauty and originality of design; a large gallery running all round the outside, on two floors, and two rectangular halls in the two wings, two storeys high, containing the means of access to the upper floors, and giving an uninterrupted vista from end to end of the building. A fine frieze in bas-relief, by M. Joseph Blanc, about 300ft. long, represents the history of art, and is placed behind the colonnade. It has been executed at Sèvres, in opaque pottery or ceramic, and gave a most remarkable effect, being obviously inspired by the Assyrian friezes of Darius.

The Petit Palais.

This very fine building, to me the gem of the Exhibition, covers a surface of 7,000 square mètres, or nearly $1\frac{3}{4}$ acres. It is intended, like the grand palace, to be a permanent home for French art, a State museum in fact, and will become the property of the City of Paris. In construction it should be noted that in this building steel was used to only a limited extent. The walls were all of rubble faced with ashlar, the vaults and floors of brickwork set in gypsum, and the roofs, with a little steel, covered all. These particular vaults were constructed of brick, set in plaster, *i.e.*, the plaster of Paris, which is the universal cementing material, without any centering, only a small curved template being used as a guide; the men worked very rapidly (as plaster sets quickly) in laying the rings or courses of the domes or vaults till the shell was complete; this formed a centre for the next, and even a third, if required, shell on top of this. The cost of this style of work, very light and very strong, was 40f. per square metre; it was very quickly built, and exerted practically no thrust on the walls. The internal stucco decoration was then laid over the surface of the vault as required.

In plan this palace was D-shaped, the interior being a garden surrounded by a semicircular colonnade, round which was grouped a double range of galleries in a semi-hexagonal form for the exhibits; the straight part of the D formed the façade, the main entrance being in the centre, leading into a fine domed hall off which were two lateral galleries at a slightly higher level, and at the ends or corners, two saloons, from which one enters upon the galleries at rear. Several modifications were made in the design in M. Girault's final drawings, and even during the progress of the works, in order to harmonise with the great palace opposite. The order employed in the façade is an Ionic one, with lofty bay in the intercolumniations, the shafts being free from the wall, while in the end pavilions the columns repeat the order but are "engaged." Sculpture is used in abundance, the central porch giving us some very fine "motifs." Internally the decoration is as surprising as the scheme of the exterior, the vaults and domes being covered with relief ornament and sculpture, very fine in treatment and used unsparingly. The columns and pilasters are of a bright and cheerful pink tone.

The Pont Alexandre III.,

though purely engineering work, claims our close attention; for were not two of the leading Parisian architects employed to co-operate with the engineers? Can we point to any such example in England, or even in the world? And what is the result? The finest bridge, considered from either the constructive or decorative aspect, that has yet been seen, retaining its monumental character and bearing a great dignity in spite of its festal decorations.

The bridge is constructed entirely of steel, 350ft. in span, in one low sweep, the rise being 6½ metres, composed of fifteen girders (representing the width of the bridge, which is of the noble dimension of 40 metres), each girder being in two pieces, hinged, or articulated at each abutment and in the centre to allow of the necessary spring. The roadway had to be kept level, or nearly so, with the approaches, in order that the vista of the Invalides should not be interfered with when seen from the opposite bank. The cost of the metal work used in this bridge was about 2¾ million francs, and the accepted tender for the foundations amounted to over 1¾ million more, 12 per cent. below the engineers' price. The contractors were MM. Letellier and Boutringuien, who had already done the foundations of the Pont Mirabeau (one of the newest bridges in Paris), under the same engineers. The chief decorative features are the pylons, the dec statues, the lamp standards, the parapets, and the cartouches.

The strain on the abutments is about 50 kilogrammes per square centimetre. It took over 7,000 tons of steel, all from the Creusot works, laid from a latticed-framed gangway or temporary bridge, first erected to facilitate the placing the girders in position, and then removed. The abutments are in granite blocks from the Vosges, the only material, perhaps, that would stand the immense strain. The setting out was so carefully done that on joining up the centre the discrepancy amounted to $\frac{7}{10}$ of a millimetre on a total length of over 350ft.

The foundations had to be carried down to a depth of 54ft. on the right bank, and nearly 60ft. on the other. Caissons were sunk in the proper positions, and afterwards filled with concrete and granite. Needless to say compressed air was employed in the sub-fluvial excavations. Some very massive castings bedded in the abutments receive the ends of the fifteen steel girders, a pin, circular in section, separating the ends of the girders from the cup in the casting to allow of the necessary movement. Each outer girder weighed 167 tons, and the others 144 tons. The platform carrying the roadway is supported by vertical members, connected to the longitudinal girders and then floored over with steel plates riveted down to the substructure, and extending over the quays as well, where a system of masonry arches takes the place of the steel framing of the bridge.

Mr. Wonnacott then referred in detail to many other buildings which have already been described in our columns.

Correspondence.

St. Mary's Church, Bury St. Edmunds.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, E.C.

SIR,—In the article on Bury St. Edmunds published in your issue for January 23rd last, Mr. Walker does not mention the extremely fine panelled ceiling of St. Mary's Church, which is flat, with a central pendant of open tracery work: it is executed in stone and has a span of about 12ft. The stones are dovetailed together, and the whole forms an interesting and somewhat unusual piece of construction. This ceiling, until comparatively recently, was covered by a thick coating of plaster.—Yours truly,

R. H. MAYHEW, A.R.I.B.A.

A Memorial to Queen Victoria.

To the Editor of THE BUILDERS' JOURNAL.

WIMBORNE.

SIR,—A covered Gothic monument to my mind is the best for London; octagonal on plan, after Santa Maria Della Salute, Venice—say, 100ft. in diameter and 150ft. high. In the centre in pure statuary marble "Victoria the Good." On the walls sculptured in Sicilian marble, "The Good and Great," and also showing the progress in carving made during her reign. Materials: good granites and stone from all parts of the Empire. I can see in the idea what I think would be the greatest monument in the world, with its fine sculptured work, lofty columns and groined ceilings. A building properly warmed would preserve the most delicate sculpture, and last for all time.

Yours truly,

W. T. CHINCHEN.

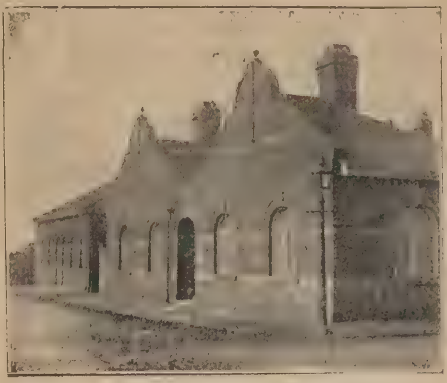
Professional Practice.

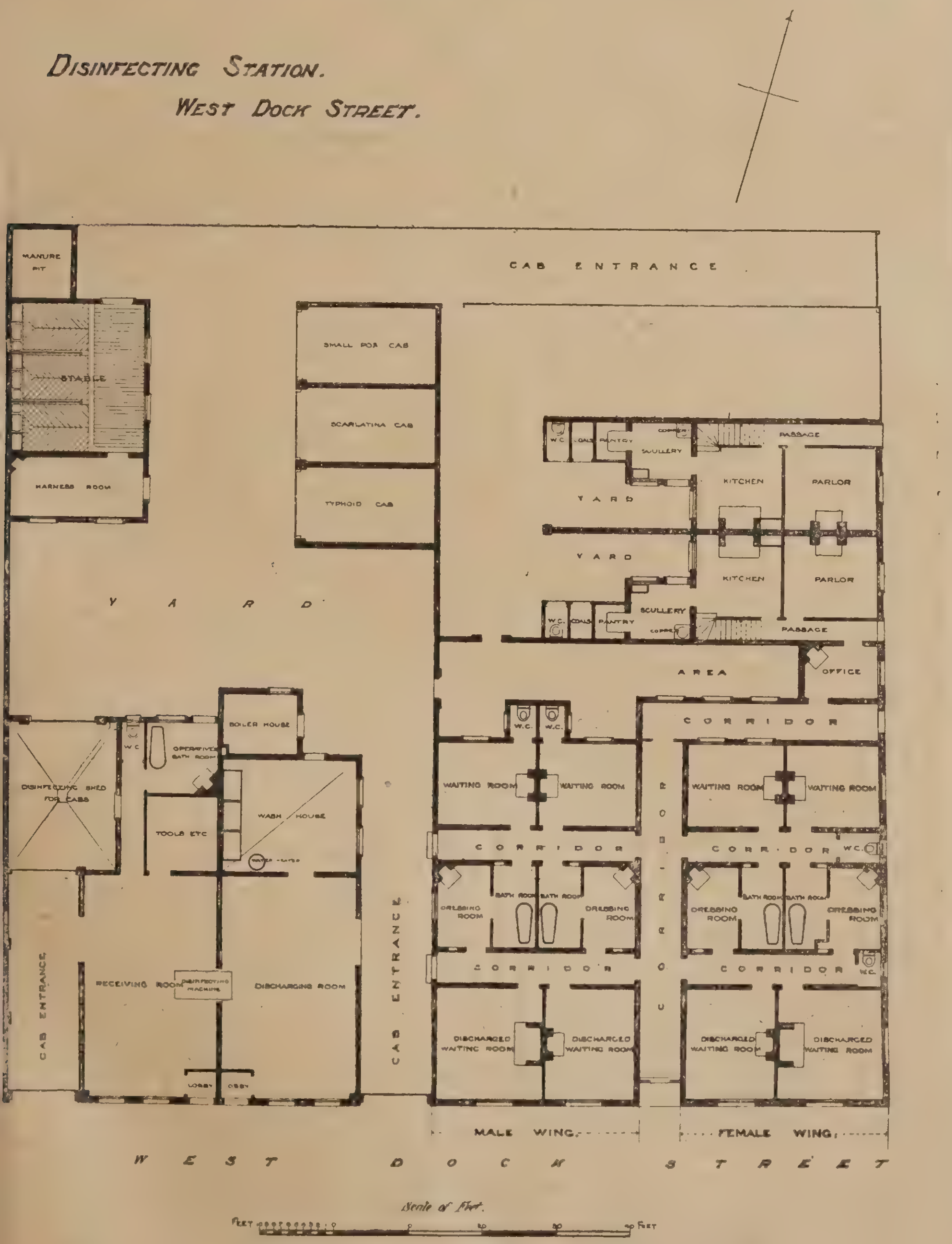
Hull.—A disinfecting station was opened at Kingston-upon-Hull last week. The buildings, which are situated in a corner position near the Albert Dock, are of a plain and substantial character, and form an interesting block inasmuch as they are about the first permanent buildings designed for this special purpose. Upon referring to the plan it will be seen that the infected person is received in one street and discharged in another after having been through waiting-room, bath-room, dressing-room, and discharged waiting-room. It will be noticed also that there are two complete suites of rooms, one for males and another for females. The clothing of the infected person is passed through a hatch from the bath-room into a corridor, and is thence taken by an attendant to the receiving-room of the disinfector and is returned from the discharging-room of the disinfector through a different corridor and delivered to the dressing-room by another hatch, so that while the person is bathing the clothing is being disinfected. The attendants are accommodated in houses on the site, and stabling is provided for three horses. There is also a disinfecting shed for cabs, and separate cab sheds for the different contagious diseases. Four one-storey cottages have also been erected where persons may stay until their homes have been disinfected by the authorities. The cost of the whole of the buildings, exclusive of land and furnishing, is about £5,500. The contract has been carried out under the supervision of the city architect, Mr. Joseph H. Hirst.

Kirkburton.—Mr. J. Berry, architect, of Huddersfield, has prepared plans for the proposed new buildings for the Joint Isolation Hospital Committee. The buildings, which are to be erected off North Road, adjoining Dean Quarry, will consist of an administration block, two storeys in height, with a southern aspect, containing on the ground floor principal entrance, matron's room, nurses' room, dress-room, kitchen, scullery, lavatory, pantry and storeroom. On the same floor there is to be a suite of discharging rooms on the western side of the block, consisting of an undressing-room, bath-room, and dressing-room, in which convalescents may take their final ablutions and acquire clean clothes before leaving the hospital. On the first floor there are six bedrooms, a dressing-room, bathroom, &c. The outbuildings are arranged on the northern side, and the tradesmen's entrance on the eastern side. The ward pavilion will be built practically on pillars, thus allowing a free circulation of air around and underneath the whole building, and will provide accommodation for fourteen persons, eight in one ward and six in the other. The entrance is in the centre of the building, having on the left a clothes store and pantry, and on the right a bath-room. Immediately opposite is the ward kitchen, having two fixed windows allowing complete observation of the two wards. The isolation quarters contain two wards with accommodation for four patients in each, with a ward kitchen in the centre. There is a verandah running along the whole length of the building. The laundry block consists of a wash-house, laundry, and drying closet, disinfecting rooms, ambulance stable, coal, coke and wood stores, mortuary and viewing-room, &c. At the entrance gates there will be a lodge one storey high, containing a living-room, scullery and one bedroom, with outbuildings.

New York.—Messrs. Herbert S. and Dudley S. Harde, who built "The Towers," at Ninety-fourth Street and Central Park West have begun work on their new Riverside Drive structure, "The Turrets." It will cost $350,000, exclusive of land. Rentals for each suite will range from $2,000 to $10,000 a year. "The Turrets" will occupy the south-east corner of the drive at Eighty-fourth Street. It was designed by the architects, Herbert S. Harde and R. Thomas Short, to be New York's latest and most improved apartment building. It will contain suites of ten rooms and three baths to twenty rooms and six baths. Its luxurious appointments will surpass any residential structure heretofore erected on Manhattan Island. The largest rentals obtained at present for any apartment do not exceed $6,000. "The Turrets" will be seven storeys high, of granite, Indiana limestone, terra cotta and brick. The architects have specially designed it to meet the demand and requirements of wealthy families who are leaving the lower Fifth Avenue districts. The building will cover an area of about 12,000 sq. ft. The twenty-room suites will occupy an entire floor, thus affording much more room than the present average five-storey private house. The large suites will include a very large foyer hall, reception room, library, den, drawing-room, music room, conservatory, dining-room, billiard-room, five chambers, five bathrooms and dressing-rooms, nursery, sewing-room, three servants' rooms, servants' bath, laundry, ironing and drying rooms, kitchen and butler's pantry. The smallest suite will contain ten rooms and three bathrooms. Safes for silver in the dining-room will be placed in the panelling of the wainscoting. Mirrors will be placed in the panels of all chamber doors. The bathrooms and kitchens will have walls and floors of pure white marble. There will be an unusual amount of closet room for every suite. There has also been arranged a large ballroom with banquet hall, a billiard room and gymnasium for the free use of tenants. In the basement will be a barber's shop, large marble swimming pool provided with hot and cold water, a general house laundry and accommodations for storing and charging automobiles. There will also be arrangements for the rental of automobiles to the tenants. There will be electric light and telephone in each suite. The servants' quarters will be built in a wing distinct from the main structure.

Portsmouth.—A new technical institute is to be erected on the plot of ground in Park Road, now known as the Mayor's lawn, behind the Town Hall, and will, it is estimated, cost £43,086, exclusive of fittings. It has been designed by Mr. G. E. Smith, of Southsea and Gosport, and will be Classic in style, so as to harmonise as nearly as possible with the Town Hall, but of a less pretentious nature. The elevations will be of red brick and Portland stone. With the object of obtaining plenty of light for the basement floor the building will be set back 5ft. on the Park Road frontage and 30ft. on the Town Hall side, and the space thus obtained is to be used as lighting areas. The technical and art schools will occupy the whole of that part of the building facing on Park Road and part of the block facing the Town Hall, the remainder being taken up by the library section and the examination hall. There are to be three entrances, one at the corner facing the Gas Company's office, being the main entrance to the technical and art schools, another in the centre of the building facing the Town Hall for the library, and the third placed at the extreme end near the railway for use in connection with the examination hall. The entrance hall on the ground floor will be approached from the main entrance by a broad flight of steps leading up through an imposing porch, and will open on to the main staircases leading to the other floors. The main corridor will branch from the left-hand side, running the whole length of the Park Road block. The basement floor, which will be 4ft. below the level of the roadway and 14ft. high, is to be chiefly occupied by workshops, &c., on the one side, and part of the library section on the other, whilst along the Park Road front are to be situated the carpenters' shop, with spacious store, the brickwork and painters' shop, a class-room for theory and dynamo, and an accumulator-room. A boiler-house, smithy, plumbers' shop, and laboratories are provided for at the back. Facing the Town Hall will be the engineering and file rooms and reference library, with a store and a book-binding room at the rear. A wide corridor will run the length of the building in the centre, and at the end of the corridor will be situated the stairs leading to the rooms above. On the ground floor facing Park Road the secretary's room, committee room, a teachers' room and four class-rooms, with mechanical laboratory and a master's room at the back are arranged for. The Free Library, with stone steps leading up to it from the roadway, is to be on this floor, facing the Town Hall, and lighted from the front by deep bay windows. Over this the examination hall will be situated, a room two storeys high with deep bay windows. The other rooms on the same floor are to be set apart for mechanics, a lecture theatre, physical laboratories, drawing offices, a dressmaking room and wood carving and biology rooms. As on the ground floor, a wide corridor will run from end to end. On the second floor, the chemical laboratories, balance-room and lecture-room will be placed over the physical laboratories, and the chemical lecture theatre is to be arranged over the mechanics' lecture theatre. At the back are to be the life-room, antique-room and painting, and two masters' rooms are provided for on this floor. Facing the Town Hall are the modelling room, the upper part of the examination hall and a spare room. The floors are to be of fireproof construction, finished with wood blocks, and the roof constructed with iron principals. The walls of the Free Library, reading and reference rooms will be lined with glazed tiling the full height, whilst the entrance hall and staircase walls are to be provided with glazed tiled dadoes in wood framing. The building is to be heated throughout with hot water by means of radiators placed in the rooms, &c. Where necessary they will be heated uniformly, and all the radiators on the external walls are to have inlet-ventilators behind them, with baffle-plates and water-trays. The building is to be lighted by electricity; gas will be provided in case of emergency, and also for experimental purposes, and hot and cold water and steam are to be laid on. Special ventilation and drainage will be provided for the chemical laboratories. Electric bells are to be fixed throughout, and fire hydrants on each floor.


DISINFECTING STATION, KINGSTON-UPON-HULL: SOUTH ELEVATION.



PLAN OF DISINFECTING STATION, KINGSTON-UPON-HULL,
JOSEPH H. HIRST, CITY ARCHITECT HULL.

Engineering Notes.

Bessemer Gold Medal.—The Iron and Steel Institute have decided that the Bessemer Gold Medal for 1901 shall be awarded to Mr. J. E. Stead, of Middlesbrough.

St. Thomas' Church, Kingsbridge, has lately been fitted with the latest improved "small-tube" hot-water heating apparatus by Messrs. John King, Ltd., engineers, of Liverpool.

The Whitechapel and Bow Railway is now in course of construction. The contractors are enabled to work night and day shifts owing to the amount of light obtained from eight of the Thorn and Hoddle Acetylene Company's gas generators, which are sufficiently portable to meet all requirements.

Leicester Tramways.—A special committee of the Leicester Corporation has commissioned Mr. Manville, of London, to mature a scheme for applying electric traction to the whole of the Leicester tramways. The committee had also recommended the overhead trolley system, but after the startling experience at Liverpool there is a strong revolution in feeling, and a growing determination to declare for the conduit system, though it must entail a large addition to the initial cost.

London Water Companies' Regulations: Collapse.—At the resumed enquiry into the proposed new regulations by the London water companies on Thursday last Mr. Cripps, K.C., on behalf of the companies, asked the Commissioners to request the Local Government Board not to proceed farther with the present enquiry in face of the opposition that the proposals had aroused from the various local authorities. Mr. Freeman, K.C., for the County Council, said of course this withdrawal on the part of the companies brought the proceedings to an end, but he thought that as the public bodies had been put to great expense their costs should be paid. The chairman said they would submit the suggestions as to costs to the Local Government Board.

Keystones.

The Central Tower of Truro Cathedral is to be completed, the money necessary for the work having been given.

Wombwell Parish Church.—A fund has been inaugurated for the completion of the new parish church. The cost of the nave has reached the sum of £5,600, but a further sum of £4,000 is required.

The new Church of St. Cyprian, at Brockley, has been consecrated. The church has been erected from designs prepared by the late Sir Arthur Blomfield at a cost of £9,000, and contains seating accommodation for 1,500 people.

New Higher Grade Schools at Sandown, I.W. have recently been erected by the Brading School Board. The schools have been built by Mr. Ball, of Cowes, from designs by Mr. James Newman, of Sandown, and, with the furniture, have cost £7,200.

A Municipal Sanatorium for Glasgow.—The Glasgow Town Council has decided to build a Corporation House at Loch Katrine at a cost of £5,000. A specially large dining-room will be the leading feature of the mansion, which is to be furnished in a bright and attractive way.

"Dual British and Metric Table Book."—The aim of this little publication (issued at 1d. by Messrs. Allman and Son, Ltd., of 67 New Oxford Street, W.C.) is to show by means of comparison the superiority of the metric system to that used in this country. The equivalents are so arranged as to be of use in turning metric quantities into British and British quantities into metric. Mr. S. Jackson, M.A. (Oxon) is the author.

A new County Asylum for Middlesex is being erected at Napsburg, St. Albans. The site of the new building is 440 acres in extent, and was purchased at a cost of £45,000. The plans are by Mr. Rowland Plumbe, who has designed the buildings in the pavilion style to accommodate 1,150 patients, 100 of whom to be in a separate building, which is to be used only by paying patients. A hospital to accommodate 234 persons is included. The estimated cost of the buildings alone is £358,100 or £311 per patient. The St. Albans site is the best in Hertfordshire.

The Glasgow and West of Scotland Technical College Architectural Craftsmen's Society held a meeting on Friday, February 22nd, when Mr. John G. Dunn read a paper on the "Practice of Chimney Stalk and Boiler Building." To ensure the stability of a stalk, he said, the foundations must be built with best Portland cement, with footings projecting the thickness of the wall, or inverted arches used. The stalk should have a square base, a batter of ½in. to the foot, with hoop iron horizontal ties. The brick courses should be at right angles to the batter, and no port holes cut after the stalk had taken its bearing. Further remarks were made on the subject of efficiency of draught and architectural treatment, and then the lecturer passed on to the consideration of boiler setting, explaining the various types of flues, boilers and fuel economisers.

Devizes Hospital Competition.—Forty-five designs were submitted for the proposed isolation hospital at Devizes. Two premiums of £20 and £10 were offered. Mr. C. E. Ponting, the assessor, suggested five designs from which one might be selected finally, and recommended that the premiums should be awarded to "Hygiene" (Mr. E. C. Isborn, Devizes, and Mr. George Boughton, Woodlands, Ryde, I.W.); and "Q." (Messrs. Charles Bell, Wilton, and Meredith, 3 Salter's Hall Court, Cannon Street, London, E.C.). At a meeting of the committee it was decided that if the authors of the other three selected plans were agreeable they should be retained for a time, in the event of neither of the other two plans being carried out. These designs are:—"Deviser" (Mr. H. H. Clark, 38 Bow Lane, Cheapside, E.C.); "Esculapius" (Mr. R. E. Brinkworth, St. Mary's Street, Chippenham); and "Efficiency" (Mr. J. Hugh Goodman, Town Hall Chambers, Reading).

The Roman Pavement recently discovered at Dorchester has been successfully transferred by Italian workmen to the Dorset County Museum, and now covers a large part of the floor of that institution.

A Kursaal for Harrogate.—A Local Government Board enquiry was held recently into the application of the Corporation to borrow £40,000 for the erection of a Kursaal on the Spa Estate, £9,500 for the purchase of the Starbeck Estate and Baths, and £4,500 for the purpose of conveying water from the Starbeck Baths to the Royal Baths at Harrogate.

Optical Refinements in Architecture.—Mr. George Coffey lectured recently on "Optical Refinements in Classic and Mediæval Architecture," before the Architectural Association of Ireland. Examples of these optical refinements were shown from the Parthenon of the Greeks, from Pisa and Siena cathedrals, the most beautiful specimens of Italian, Romanesque and eleventh-century work, and among many other examples some arcading from Cormac's Chapel at Cashel, where the same refinements occur.

A Barrow-in-Furness Competition.—A competition was recently held for a Board School to be built near the growing suburb of Vickerstown, on Walney Island, for the Barrow-in-Furness School Board. The competition was open to local architects only. Mr. Thos. Bell, of Burnley, was appointed the assessor, and he placed the designs of Mr. Henry T. Fowler, of Ramsden Square, Barrow-in-Furness, first, those of Mr. J. Z. Macintosh second, and those of Mr. W. Moss, A.R.I.B.A., of Settle, third. The decision has been confirmed by the Board, who have appointed Mr. Fowler their architect to carry out the work. The school is to provide accommodation for 600 children, including temporary accommodation for 180 infants, who will be removed to a separate infants' building when the requirements of the district necessitate the increased accommodation.

Rodin and the Paris Municipality.—A conflict has arisen between Auguste Rodin, the illustrious sculptor, and the Paris Municipality, which put a site at his disposal during the late exhibition to allow him to display his work. The Municipality has ordered the sculptor to vacate the ground he has occupied, though he explained that he needs a short delay to allow him to re-erect his exhibition building on another site for which he is negotiating. There is the less reason for the hurry of the Municipality, as most of the other exhibition buildings in the neighbourhood of Rodin's pavilion are still standing. Two of Rodin's statues are to find a home in England. One has been acquired by Mr. Beckett, M.P., and another, purchased with the proceeds of a subscription organised by British artists, is to be placed in the South Kensington Museum. These two works are the "Creation of Man" and a "St. John."

Art and Manual Training.—Mr. J. Liberty Tadd, of Philadelphia, U.S.A., lectured recently at Barry Dock on this subject, illustrating his remarks on the blackboard, using both hands at once. The fundamental principle of the lecturer's system was the training of the mind of the child in observation, and the training of the child's hands to instant and automatic expression of its ideas. Such aids to drawing as rules, callipers, &c., were not allowed, nor was the student allowed to rub anything out, or patch anything up, but by constant repetition to make the correct drawing of figures automatic. The lecturer claimed that the influence of such teaching fascinates children. The system taught facility first, accuracy afterwards, and not *vice versâ*, as was the custom in the textbooks. The children saw more than other people in commonplace things round about; in styles and schools of architecture they could distinguish the pure and impure with greater facility than other people, and the beauties and grandeur of a work of art—whatever it may be—did not escape their observation, although it would escape the mind which had not been trained to observe. The system is pursued extensively in America.

A Municipal Library at Grimsby has been opened at a cost of £4,000.

A new Refuse Destructor at Barry has been erected. The destructor buildings were built by Messrs. Lloyd and Tape at a cost of £2,848, the two cells by Messrs. Hughes and Stirling for £2,763, and the chimney stack by Mr. J. Prout at a cost of £1,805. The site in Barry Road has a frontage of 318ft., and the area is 1 acre, 1 rood, 25 perches.

Discovery of an Early Egyptian Tomb.—The Egyptian Research Account announces the discovery in Upper Egypt of the royal tomb of Neter-Kha, the king credited with the building of the famous step-pyramid of Saggara. His name appears on a rock in Sinai near others of the Fourth Dynasty, but relics now being found in his tomb are analogous rather to those of the Second Dynasty. The nature of the tomb itself is remarkable, and had caused it to be regarded in the past as a fort. The arched roof of its descending stairway is the earliest yet recorded, and carries back the history of the Egyptian arch to the fourth millennium B.C. The excavations are being made by Mr. J. Garstang.

The late Mr. Frederick Startridge Ellis, who died last week, was for many years one of the leading dealers and experts in old books. Mr. Ellis was an intimate friend of William Morris, Dante G. Rossetti, Burne-Jones, and many others of similar phases or schools of thought; for both Morris and Rossetti he acted as publisher. Among his many friends and patrons may be named the late Mr. Ruskin, and "Stray Letters from Professor Ruskin to a London Bibliopole" (F. S. Ellis), 1892, is one of the results of this friendship. Mr. Ellis retired from business in 1885, and his large stock of rare books realised about £16,000 at Sotheby's. Of late years Mr. Ellis has shown great activity and versatility as an editor and compiler. When William Morris started the Kelmscott Press he found an enthusiastic supporter in Mr. Ellis, who, in fact, edited about a dozen of the fine publications of this press. Mr. Ellis was born on June 7th, 1830.

New Fire Stations.—The new fire brigade station in Redcross Street, London, E.C., which has been erected to replace the smaller station in Whitecross Street, was opened recently. The freehold site occupied by the new station has a frontage of about 90ft. to Redcross Street, and was purchased for £31,000, while the cost of the building has been upwards of £12,000. The engine room is equipped with two steamers, a horsed escape, a long fire ladder, and a hose cart ready for immediate use. The chief "run out" is arranged so as to be immediately opposite the scene of the great Cripplegate fire. In the upper part of the building there are 13 suites for married men and a number of single men's quarters. The station, which is lighted with electricity throughout, has been built by the Works Department of the County Council under the direction of Mr. W. E. Riley, the Council's superintendent architect. A new fire station which the County Council have erected in Pennard Road, Shepherd's Bush, at a cost of over £12,000, has also been opened.

Restoring an Old Picture.—In the City of London Court, last week, Mr. William Thompson, of Oxford Street West, made a claim against Mr. Walter Graves, architect, Winchester House, Old Broad Street, E.C., to recover seven guineas for restoring an old oil painting and supplying an old gold frame for it. The defendant said that he was greatly annoyed at what the plaintiff had done. The picture was painted by Sir Joshua Reynolds, and was a sketch of the defendant's grandfather, who was Sir Joshua's engraver. He simply asked the plaintiff, who no doubt was an able man, to varnish the work, but instead of doing so he had added to it, and thoroughly spoilt it. The picture had been altered, and he was shocked when it was returned to him by the plaintiff. The plaintiff denied that any addition had been made to the picture, and said that no paint had been put on the face or body of the person whose portrait it was. The jury found for the plaintiff for £5, which was £1 more than the defendant had paid into Court. The plaintiff also received his costs.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
	BUILDING.		
Mar. 8	Illston-on-Hill, Leices.—Clubroom	Oddfellows' Lodge	H. Nourish, Illston.
,, 8	Swindon—Stores, &c.	Dr. B. H. Dale	R. J. Beswick, 35 Regent Street, Swindon.
,, 8	Cardiff—Materials	Guardians	A. J. Harris, Queen's Chambers, Cardiff.
,, 8	Newmarket—Portland Cement	Urban District Council	J. W. Metcalf, Town Hall, Newmarket.
,, 8	Cheltenham—School	—	T. Malvern. 21 Winchcombe Street, Cheltenham.
,, 9	Glasgow—Tiles and Tiling	Corporation	J. Young, 88 Renfield Street, Glasgow.
,, 9	Treorchy, Wales—Chapel, &c.	Calvinistic Methodists	R. Morgan, 215 High Street, Treorchy.
,, 9	Dublin—Materials	General Prisons Board	Prison of Males, Cork, Ireland.
,, 9	Fishguard—School Buildings	Managers	G. Morris, Clerk, High Street, Fishguard, Pembroke.
,, 9	Shipley—School	School Board	E. P. Peterson, 48 Sunbridge Road, Bradford.
,, 11	Wanstead—Walls, &c.	School Board	J. T. Bressey, 71 Bishopsgate Street Within, E.C.
,, 11	Warminster—Schools	Urban Council	W. H. Hardick, Architect, Warminster.
,, 11	Gateshead—School	School Board	J. L. Nicholson, 55 Northumberland Street, Newcastle.
,, 11	Gateshead—School	School Board	Thompson and Dunn, St. Nicholas's Buildings, Newcastle.
,, 11	Leigh-on-Sea, Essex—Villas	—	A. J. Martin, 11 Prittlewell Square, Southend-on-Sea.
,, 11	Luton—Water Supply Works	Rural District Council	B. B. Franklin, 21 Market Hill, Luton.
,, 11	Dungarvan—Quay Wall	Urban Council	Borough Surveyor, Town Hall, Dungarvan.
,, 11	Ouskinny, Queenstown—Cottages	S. French	W. H. Hill and Son, 28 South Mall, Cork.
,, 11	Aberystwith—Houses	—	T. E. Morgan. Aberystwith.
,, 11	Beckenham—Council Chamber, &c.	Urban District Council	F. Stevens, Clerk, Council Office, Beckenham.
,, 11	Charlton Kings—Stabling, Offices, &c.	Urban District Council	J. Villar, Architect, Cambray, Cheltenham.
,, 12	West Ham—Hospital	County Borough	Borough Engineer's Office, Town Hall, West Ham, E.
,, 12	Bristol—Superstructure of Works	Electrical Committee	H. Williams, 24 Clare Street, Bristol.
,, 12	Strabane—Cottages	Rural District Council	J. E. Sharkie, Clerk, Strabane, Ireland.
,, 12	Bushey Park—National Physical Laboratory	H.M. Commissioners of Works, &c.	Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.
,, 12	Arnside, near Kendal—Chapel	Parish Council	G. L. Hoggarth, 69 Highgate, Kendal.
,, 12	Dagenham, Essex—Dynamo House	West Ham Town Council	Borough Engineer's Office, Town Hall, West Ham.
,, 12	Gloucester—Buildings	Corporation	H. A. Dancey, 26 Clarence Street, Gloucester.
,, 12	Harrow—Classroom	United District School Board	Houston and Houston, 5 York Buildings, Adelphi, W.C.
,, 12	London—Laboratory	Commissioners	H M. Office of Works, &c., Storey's Gate, S.W.
,, 12	Bromley—Street Improvements	Urban District Council	F. H. Norman, District Council Offices, Bromley, Kent.
,, 13	Distington, Cumberland—Conversion	—	Fox, Wellington House, Distington.
,, 13	Woolwich—House, &c.	Guardians	Church, Quick and Whincop, William Street, Woolwich.
,, 13	North Dublin—Cottages	Rural District Council	Mr. Monris, Clerk of Works Dublin.
,, 13	London, S.E.—Infimary	Camberwell Guardians	E. T. Hall, 57 Moorgate Street, E.C.
,, 14	Belfast—Alterations, &c.	Willowfield Church Vestry	W. J. Fennell, Architect, Scottish Provident Buildings, Belfast.
,, 14	Manchester—Extension of Market	Corporation	City Surveyor's Office, Town Hall, Manchester.
,, 14	Meltham, near Huddersfield—Alterations	—	J. Kirk and Sons, Architects, Huddersfield.
,, 14	Charing Cross—Repairs	Metropolitan Police	Police Surveyor, New Scotland Yard, S.W.
,, 15	Halifax—House	—	J. F. Walsh and G. Nicholas, Lancs. and Yorks. Bank Chbrs, Halifax
	ENGINEERING.		
Mar. 8	Leeds—Trolley Wires and Attachments	Tramways Committee	City Engineer, Municipal Buildings, Leeds.
,, 8	Hull—Boiler	Corporation	A. E. White, City Engineer, Town Hall, Hull.
,, 8	Ossett, Yorks—Sewage Works	Corporation	Engineer's Office, Church Street Chambers, Dewsbury.
,, 8	Leeds—Underground Conductors	Tramways Committee	City Engineer. Municipal Buildings, Leeds.
,, 9	Glasgow—Heating	Corporation	J. Young. 88 Renfield Street, Glasgow.
,, 9	Tavistock—Bridge	Rural District Council	J. Northey, Surveyor, Lake, Lifton.
,, 11	Southampton—Cables, &c.	Corporation	Kincaid, Waller and Manville, 29 Great George Street, Westminster.
,, 11	Glasgow—Crane	Clyde Navigation Trustees	T. R. Mackenzie, 16 Robertson Street, Glasgow.
,, 11	Bewdley—Waterworks	Corporation	R. E. W. Berrington, Civil Engineer, Wolverhampton.
,, 11	Santandar, Spain—Floating Dredger	Committee of Works	Corporation Offices, Santandar.
,, 11	Aughrim—Water Supply	Rathdrum Rural District Council	B. Manning, Board Room, Workhouse, Aughrim, Ireland.
,, 11	Dungarvan—Quay Wall	Urban District Council	Borough Surveyor, Town Hall, Dungarvan, Ireland.
,, 11	Luton—Water Supply Works	Rural District Council	B. B. Franklin, 21 Market Hill, Luton.
,, 12	Wargrave—Extension of Mains	Wokingham Rural District Council	Berriss, Victoria Road, Wargrave.
,, 12	London, E.C.—Cables, &c.	Shoreditch Borough Council	H. M. Robinson, Shoreditch Town Hall, Old Street, E.C.
,, 12	Copenhagen—Rails, &c.	Danish State Railways	Engineer-in-Chief, 11 Colljornsensgade, Copenhagen, B.
,, 14	Bray—Plant	Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
	IRON AND STEEL.		
Mar. 8	Cardiff—Ironmongery	Guardians	A. J. Harris, Queen's Chambers, Cardiff.
,, 11	Barnes—Ironmongery	Urban District Council	Engineer and Surveyor, Council Offices, Barnes.
,, 11	Workington—Pipes, &c.	Corporation	J. Eden, 58 Pow Street, Workington.
,, 12	Norwich—Ironwork	—	A. E. Collins, City Engineer, Guildhall, Norwich.
,, 12	London, E.C.—Ironwork	Borough Council	H. M. Robinson, Shoreditch Town Hall, Old Street, E C.
,, 12	London, W.—Pipes, &c.	Kensington Borough Council	Clerk, Town Hall, Kensington.
,, 12	Preston—Pipes	Corporation	Corporation Offices, Town Hall, Preston.
,, 13	Enfield—Pipes, &c.	Urban District Council	R. Collins, Council's Surveyor, Enfield.
,, 13	Eastbourne—Various	Town Council	Borough Engineer's Office, Town Hall, Eastbourne.
,, 15	Cromer—Pipes	Urban District Council	A. F. Scott, Church Street, Cromer.
,, 16	Bollington, Cheshire—Pipes, &c.	Urban District Council	W. H. Raoford, Albion Chambers, King Street, Nottingham.
,, 20	Reading—Manhole Covers	Corporation	J. Bowen, Engineer and Surveyor, Town Hall, Reading.
	PAINTING AND PLUMBING.		
Mar. 8	Leeds—Painting (two contracts)	Corporation	City Engineer, Municipal Buildings, Leeds.
,, 8	Manchester—Painting Work	Corporation	Secretary, Waterworks Offices, Town Hall, Manchester.
,, 8	Derby—Paints, Oils, &c.	Town Council	J. Ward, Borough Surveyor, Babington Lane, Derby.
,, 8	Thirlmere Aqueduct, Manchester—Painting Bridges	Corporation	Secretary, Waterworks Offices, Town Hall, Manchester.
,, 9	Burntwood, near Lichfield—Repainting	—	W. H. Cheadle, County Surveyor, Stafford.
,, 13	Eastbourne—Oils, &c., Colours, &c.	Town Council	Borough Engineer, Town Hall, Eastbourne.
,, 20	Fulham—Plumbing	Metropolitan Borough	W. J. H. Denslow, Town Hall, Walham Green.
	ROADS AND CARTAGE.		
Mar. 8	Bournemouth—Gravel, Granite, &c.	Town Council	F. W. Lacey, Borough Surveyor, Bournemouth.
,, 8	London, S.E.—Granite Cubes, &c.	Penge Urban District Council	Surveyor, Town Hall, Anerley.
,, 8	Eastbourne—Flints	Guardians	Chairman, Workhouse, Eastbourne.
,, 8	Derby—Granite, Gravel, &c.	County Council	J. Ward, Borough Surveyor, Babington Lane, Derby.
,, 8	Hull—Stone	Corporation	A. E. White, City Engineer, Town Hall, Hull.
,, 8	High Wycombe—Flints	Rural District Council	A L. Grant, Crown Lane, High Wycombe.
,, 9	Worcester—Road Stone and Slag	Highways and Bridges Committee	J. H. Garrett, Shire Hall, Worcester.
,, 9	Denbigh—Stone	County Council	E. W. Jones, District Surveyor, Wrexham.
,, 9	Andover—Road	—	A. Herbert, Estate Agent, Andover.
,, 9	Congleton, Cheshire—Materials	Highways and Sewerage Committee	R. Burslam, Town Hall, Congleton.
,, 9	Rotherham, Materials, &c.	Rural District Council	R. Bradbury, 29E, High Street, Rotherham.
,, 11	Barnes—Granite, Flint, &c.	Urban District Council	Engineer and Surveyor, Council Offices, Barnes.
,, 11	Kettering—Gravel, Cartage, &c.	Urban District Council	T. R. Smith, Surveyor, Market Place, Kettering.
,, 11	Grassendale, Lancs—Materials	Urban District Council	F. W. Bowden, District Surveyor, Grassendale.
,, 11	Ilford—Making up	Urban District Council	H. Shaw, Surveyor, Ilford.
,, 11	Ilford—Forming, &c.	Urban District Council	Surveyor, 7 Cranbrook Road, Ilford.
,, 12	Bath—Materials, &c.	Urban District Council	C. R. Fortune, City Surveyor, Bath.
,, 12	London, E.C.—Broken Granite, &c.	Shoreditch Borough Council	Clerk, Town Hall, Old Street, E.C.
,, 12	Leeds—Asphalting	Corporation	City Engineer, Municipal Buildings, Leeds.
,, 12	London—Broken Granite, Pipes, &c.	Kensington Borough Council	Clerk, Town Hall, Kensington.
,, 12	Southall, Middlesex—Granite	Urban District Council	H. R. Felkin, High Street, Southall.
,, 12	Barking—Levelling, &c.	Urban District Council	E. H. Lister, Public Offices, Barking.
,, 12	Bourne, Lincs.—Granite	Urban District Council	S. R. Andrews, Clerk, Bourne.
,, 12	Bromley, Kent—Widening	Urban District Council	Council Surveyor, Bromley, Kent.
,, 12	Ely—Granite, &c.	Rural District Council	A. D. Ennals, Surveyor, Lynn Road, Ely.
,, 12	Lewisham—Kerbing, &c.	Council	Surveyor, Town Hall, Catford, S E.
,, 12	Willesden—Road-making, &c.	District Council	O. C. Robson, Public Offices, Dyne Road, Kilburn, N.W.
13	Eastbourne—Granite, Stone, &c.	Town Council	Borough Engineer, Town Hall, Eastbourne.
13	Linlithgow, Scotland—Quarrying	County Council	A. Forbes, County Buildings, Linlithgow,

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	Road and Cartage.—*Continued.*		
Mar. 13	Bingham, Notts—Materials	Rural District Council	R. H. Beaumont, Clerk's Office, Market Street, Bingham.
„ 13	South Shields—Wood Paving Works	Corporation	S. E. Burgess, Borough Engineer, Chapter Row, South Shields.
„ 13	Bexley—Materials	Urban District Council	W. T. Howse, Surveyor to the Council, Bexley.
„ 13	Hoo, Kent—Road Materials, &c.	Rural District Council	R. P. Smyth, Clerk, Strood.
„ 13	Rishton, Lancs—Materials	Urban District Council	J. J. Adams, 4 Church Street, Rishton.
„ 15	Flaxton, Yorks—Materials	Rural District Council	J. Peters, 4 New Street, York.
„ 16	York—Materials	Corporation	A. Creer, City Engineer, Guildhall, York.
„ 16	Withington, Lancs—Road Materials, &c.	Urban District Council	A. H. Mountain, Town Hall, West Didsbury, Manchester.
„ 16	Walton-on-Thames—Various	Urban District Council	C. J. Jenkins, Engineer and Surveyor's Office, Walton-on-Thames.
„ 18	Sunbury-on-Thames—Kerbing, &c	Urban District Council	H. F. Coales, Surveyor, Sunbury-on-Thames.
„ 18	Prestwich, Lancs—Street Works	District Council	L. A. Orford, Chester Bank, Bury New Road, Prestwich.
	SANITARY.		
Mar. 8	Newmarket—Coping	Urban District Council	J. W. Metcalf, Town Hall, Newmarket.
„ 8	Durham—Scavenging	Rural District Council	J. Menzies, Woodview, Shincliffe, Durham.
„ 8	Guildford—Drainage Work	Guardians	Peak and Lunn, 36 High Street, Guildford.
„ 9	Denbigh—Gullies, &c.	County Council	E. W. Jones, District Surveyor, Wrexham.
„ 9	Failsworth Lancs—Laying out ground	Urban District Council	C. J. Lomax, 37 Cross Street, Manchester.
„ 9	Hunslet, Leeds—Sewerage Works	Rural District Council	C. H. Marriott, Son and Shaw, Church Street Chambers, Dewsbury.
„ 11	Panteg, Wales—Scavenging, &c.	Urban District Council	W. H. Orlidge, Council Offices Pontymoil.
„ 11	Rotherham—Removal of night soil	Rural District Council	B. Godfrey, 29B High Street, Rotherham.
„ 11	Worsley, Lancs—Sewers	Urban District Council	J. T. Proffitt, District Offices, Walkdon, near Manchester.
„ 12	Bath—Sewer Pipes, &c.	Urban Sanitary Authority	City Surveyor's Office, Bath.
„ 12	Hetton, Durham—Scavenging	Urban District Council	J. G. Baty, Council Offices, Houghton-le-Spring, R.S.O.
„ 14	Kirkcaldy—Sewer, &c.	Town Council	W. O. Sang, City Engineer, Kirkcaldy.
„ 16	Rugeley, Staffs—Sewers, &c.	Urban District Council	Pritchard, Green & Co., 37 Waterloo Street, Birmingham.
	TIMBER.		
Mar. 9	Dublin—Timber	—	Prison for Males, Cork.
„ 12	London, E.C.—Timber	Shoreditch Borough Council	H. M. Robinson, Shoreditch Town Hall, Old Street, E.C.
„ 13	Eastbourne—Timber	Town Council	Borough Engineer, Town Hall, Eastbourne.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
March 25	Basford—Sewerage Scheme	—	C. J. Spencer, Clerk, Public Offices, Basford.
April 30	Keighley—Public Library	£50, £30, £20	W. H. Hopkinson, Borough Engineer, Town Hall, Keighley.
No date.	Torquay—Illuminated Clock Tower	—	C. S. Wollen, Hon. Sec. Mallock Memorial, 1 Lower Terrace, Torquay.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the Work.

ABRIDGE, Essex.—For the providing and laying of about 1,300yds. of 6in. to 8in. pipe sewers, with manholes in connection therewith, the construction of a pumping station, storage tanks, &c., and the laying out of four acres of land at Abridge, about two miles from Theydon Bois Great Eastern Railway Station, for the Ongar Rural District Council:—

Woods & Fruhling, 195 Upper Thames Street, London	£2,370	0	0
S. Saunders, Earl's Court Square, London	2,257	0	0
W. Griffiths & Co., Bishopsgate Street Without, E.C.	2,083	0	0
Reader & Smith, Abridge, Romford	2,045	0	0
T. Adams, Green Lanes Goods Station, G.E.R., Wood Green	1,936	19	8
T. Keen & Sons, Theydon Bois	1,591	19	6
W. & C. French, Buckhurst Hill	1,550	0	0
J. Jackson, Forest Gate	1,498	17	10
W. Manders, Leyton	1,489	3	0
G. Bell,* Tottenham	1,435	0	0
W. Thair & Co., 144 Shrewsbury Road, East Ham	1,309	3	8

* Accepted.

BISHOP AUCKLAND.—For the erection of new court house and additions and alterations to Bishop Auckland police station, for the Standing Joint Committee of the County Council of Durham and Quarter Sessions. Mr. W. Crozier, county architect, Durham:—

J. Elliott, North Shields and Manchester	5,846	0	0
J. Armitage, Southwick	4,747	9	6
R. Blackett & Son, Greencroft, Darlington	4,112	0	0
G. H. Bell, Bishop Auckland	4,099	9	0
T. Manners, Peel Street, Bishop Auckland	4,023	19	0
R. Wilson, Victoria Terrace East, Barnard Castle	3,625	12	6
T. Hilton,* Bishop Auckland	3,601	19	11

* Accepted.

BRIGHTON.—For the supply, delivery, and erection complete of the overhead trolley construction and equipment on the whole of the tramway routes, for the Council:—

G. Hill & Co., Manchester	£13,655	11	4
Lowdon Bros. & Co., Dundee	11,834	0	0
Macartney, McElroy & Co., Limited, London	11,218	8	10
National Electric Wiring Company, Ltd., London	11,189	10	0
R. W. Blackwell & Co., Limited,* 59 City Road, E.C.	11,073	14	7

* Accepted.

BRIGHTON.—For the following in connection with the construction of an electricity generating station at Southwick, near Brighton, for the Brighton Town Council: (1) construction of a timber dam and concrete weir; (2) construction of a wharf and timber piling; (3) construction of concrete foundations for a steel building. Mr. Francis J. C. May, M.I.C.E., F.S.I., Town Hall, borough engineer, Brighton:—

A. C. Nunn, Tenterden	£49,650	0	0
Cooke & Co., Westminster	41,787	0	0
Leggott & Speight, Hull	40,639	0	0
Griffiths & Co., Limited, London	36,471	14	5
Pedrette & Co.,* London	35,760	0	0
S. Saunders, London (foundations only)	28,300	0	0

* Accepted.

BUNCRANA, Co. Donegal.—Accepted for the erection of residence for Mr. P. Porter. Mr. James P. McGrath, C.E., architect, 28 Carlisle Road, Londonderry:—

R. Colhoun and Company £560

CANTERBURY.—For the extension of the electricity works, for the Lighting Committee. Mr. A. C. Turley, A.M.I.C.E., city surveyor:—

J. Barker & Co., Kensington	£3,397	0	0
W. J. Adcock, Canterbury	3,341	0	0
Exors. H. B. Wilson, Canterbury	3,314	6	10
A. J. Brewster,* Canterbury	3,156	16	11

* Accepted.

[Electrical engineer and City surveyor's estimate, £3,000.

CARDIFF.—For the erection of shops and offices in Queen Street, Cardiff. Messrs. Teather & Wilson, Queen Street, Cardiff, architects:—

J. E. Evans, 22 Plasnewydd Place	£4,100	0	0
G. Griffiths, Working Street	4,007	10	0
A. W. Cadwallader, Fairoak Road	3,910	13	7
J. H. Venning, 59 Mackintosh Place	3,850	0	0
S. Shepton & Son, Sandon Street	3,741	10	0
F. Couzens, 75 Cowbridge Road	3,725	0	0
J. S. Chubb & Co., Metal Street	3,690	0	0
A. J. Howell, Galston Place	3,680	0	0
F. Small, Edwards Place	3,680	0	0
W. T. Morgan, Fairoak Road	3,645	0	0
E. Turner & Sons, Penarth Road	3,598	0	0
Knox & Wells, Bangor Street	3,590	0	0
G. Couzens, Riverside Works	3,497	16	6
Lattey & Co., Allanbanks Road	3,468	0	0
W. H. Ingleson, 49 Beda Road	3,448	0	0
J. Allan, Woodville Road	3 250	0	0

CHIPPENHAM.—For the erection of new house at Hardenhuish, for Captain M. Allfrey. Mr. Harold Brakspear, F.S.A., architect, Corsham. Quantities by Messrs. Pinks & Watson, Parliament Mansions, Victoria Street, S.W.:—

Hayward & Wooster	£9,427	R. Rudman,* Chippenham	£8,377
H. Hoskings	8,594		

* Accepted.

CROYDON, South.—For alterations and additions to the Surrey Drovers' Hotel, Selsdon Road, for Mr. A. G. Towler. Mr. D. Carmichael, architect, London. No quantities:—

Whitehead & Co.	£2,065	Umlandt & Nicholl	£1,440
Smith & Sons	1,987	Worsfold & Sons,* Croydon	1,329
Truett & Steel	1,684		
Bulled & Son	1,497		

* Accepted.

GLASGOW.—Accepted for the erection of a hospital, Stobhill, Springburn (first section), for the Parish Council. Messrs. Thomson & Sandilands, 241 West George Street, Glasgow, architects:—

J. J. & P. M'Lachlan, Larbert, masons and bricklayers	£72,089	0	0
D. Buchanan, London Road, Glasgow, joiner	23,705	15	1

LONDON.—For the erection of the Anerley Cottage Home for Deaf, for the London School Board. Mr. T. J. Bailey, architect:—

C. Wall	£22,500	Spencer, Santo & Co., Lim.	£20,740
J. Garrett & Son	22,174	E. Lawrance & Sons	20,607
B. E. Nightingale	21,850	Stimpson & Co.	20,570
F. & H. F. Higgs	21,469	W. Johnson & Co., Lim.	19,958
Kirk & Randall	21,324	J. Smith & Sons, Lim.	19,916
E. Triggs	21,214	J. & C. Bowyer	19,695
McCormick & Sons	20,998	Holliday & Greenwood*	19,000

* Recommended for accceptance.

LONDON.—For raising a new storey over top playground for the purpose of a science room at Sumner Avenue School, for the London School Board. Mr. T. J. Bailey, architect:—

Lathey Bros.	£1,798	0	T. Hooper & Son	£1,427	0
J. F. Ford	1,689	0	E. P. Bulled & Co.	1,373	0
J. Marsland & Sons	1,540	0	W. V. Goad	1,365	15
H. & G. Mallett	1,443	0	H. Line *	1,200	0

* Recommended for acceptance.

LONDON, E.C.—For the erection of new electricity station, Whiston Street, Haggerston, for the Metropolitan Borough of Shoreditch. Messrs. Kincaid, Waller and Manville, engineers. Quantities by Mr. John Rider Hunt, Bridge House, 181 Queen Victoria Street, E.C.:—

A. E. Symes	£20,300	0	0	Wall & Co.	17,742	0	0
G. E. Todd	19,919	0	0	Harris & Wardrop	17,639	0	0
Foster Bros.	19,735	0	0	C. G. Hill	17,550	0	0
Dolman & Co.	18,950	0	0	Chessum & Sons	17,438	0	0
F. G. Minter	18,349	0	0	Storrs, Sons & Co.	17,299	0	0
Wallace & Co., Lim.	17,962	16	11	Johnson & Sons,* Leicester	16,633	0	0
C. Ford	17,941	0	0				

* Accepted.

LONDON, N.—For the erection of a dust destructor on the Eaton House site at the High Cross, for the Tottenham Urban District Council:—

Manlove & Co.	£15,408	0	Heenan & Froud	£8,749	10
Horsfall Company	13,355	0	Mason, Lim.	8,544	0
Meldrum Bros.	9,998	0	Hughes & Stirling	7,449	0
Baker & Son	9,167	0			

[Tenders referred to committee.]

LONDON.—For removing two iron buildings and appurtenances from the Rosendale Road site and re-erecting them upon the Broadwater Road site, also providing a new iron building complete and two blocks of offices, for the London School Board. Mr. T. J. Bailey, Board's architect:—

T. Cruwys	£1,975	J. & W. T. Hunter	£1,725
W. Harbrow	1,744	Humphreys, Lim.	1,611
T. J. Hawkins & Co.	1,725	J. Mitson & Co.*	1,563

* Recommended for acceptance.

LONDON.—For the erection of special school for 60 children at Garratt Lane, for the London School Board. Mr. T. J. Bailey, architect:—

C. Wall	£3,888	W. H. Lorden & Son	£3,595
J. & M. Patrick	3,849	J. Carmichael	3,592
O. Craske	3,667	W. Johnson & Co., Lim.	3,465
Lathey Bros.	3,667	Stimpson & Co.*	3,377

* Recommended for acceptance.

LONDON, S.W.—For supplying and fixing kitchen fittings, ovens, &c., at the Tooting Bec Asylum, for the Metropolitan Asylums Board:—

R. & A. Main, Limited, 214 St. John Street, Clerkenwell, E.C.	£2,850	0	0
Hayward Bros. & Eckstein, Limited, 187-193 Union Street, Borough, S.E.	2,205	2	7
Wenham & Waters, Paragon Works, Vicarage Road, Croydon	1,960	0	0
Clements, Jeakes & Co., 51 Great Russell Street, Bloomsbury, W.C.	1,850	0	0
J. & F. May, 33 & 35 Whetstone Park, Lincoln's Inn Fields, W.C.	1,700	0	0
Benham & Sons, Limited, 50 Wigmore Street, W.	1,560	0	0
Moorwood, Sons & Co., Limited, Harleston Ironworks, Sheffield *	1,538	0	0

* Accepted. [Architect's revised estimate, £1,500.]

RATHMULLEN, Co. Donegal.—Accepted for plumbing, gasfitting, and bellhanging to "Hollymount." Mr. James P. McGrath, C.E., architect, 28 Carlisle Road, Londonderry:—

Doherty & Boyle, Londonderry £104

RYDE, Isle of Wight.—For proposed Western Esplanade extension, for the Town Council:—

S. Saunders	£17,825	0	0	F. Bevis	£9,113	10	0
Goston & Co.	15,285	0	0	B. Cooke & Co.	8,510	0	0
Pedrette & Co.	12,729	2	4	A. Fasey & Son *	8,479	0	0
F. Grace	11,208	0	0	I. Barton †	8,252	0	0

* Accepted. † Withdrawn.

SALISBURY.—For erection of a Masonic Hall in Crane Street, Salisbury. Mr. Alfred C. Bothams, architect, 32 Chipper Lane, Salisbury:—

Webb & Co., 49 Blue Boar Row, Salisbury	£2,140	0
W. Day, 105 Milford Hill, Salisbury	1,941	0
Wort & Way, Castle Street, Salisbury	1,825	0
T. Dawkins, Barford St. Martins, nr. Salisbury	1,820	0
E. Witt, Fisherton, Salisbury	1,807	5
H. J. Kite,* Fisherton, Salisbury	1,600	0

* Accepted.

WESTON-SUPER-MARE.—For works in connection with widening and extending the Marine Parade at Weston-super-Mare, between Madeira Cove and the Pier Hotel Cafe, for the Urban District Council. Mr. Hugh Nettleton, surveyor:—

Whole work.

S. Saunders, London	£3,829	10	0

Excluding Madeira Cove.

H. W. Pollard, Bridgwater	3,841	19	6
W. M. Dubin, Weston-super-Mare	3,796	0	0
C. Taylor, Weston-super-Mare	3,784	0	0
R. H. B. Neal, Plymouth	3,493	0	0
Krauss & Son, Bristol	3,407	0	0
W. Gibson,* Exeter	3,348	6	6

Madeira Cove section.

R. H. B. Neal	750	0	0
W. Gibson	736	13	6
H. W. Pollard	653	16	0
Krauss & Son	598	0	0
W. M. Dubin	570	0	0
C. Taylor	553	0	0
P. Hart,* Uphill	516	0	0

* Accepted.

Surveying and Sanitary Notes.

New Over-cliff Drive for Bournemouth.—The Town Council have decided to construct a grand marine drive and promenade along the greater part of the West Cliff. The cost of the proposed works is estimated at £10,000.

A Prescot Improvement.—A Local Government Board enquiry was held recently into the petition of the Prescot District Council for power to carry out an improvement scheme which includes the demolition of a quantity of insanitary property between High Street and Eccleston Street, and the making of a new street from High Street to Eccleston Street and a street to Hill Street

The Building Trades Exhibition.—"The Surveyor" newspaper will hold an exhibition in connection with the Building Trades Exhibition at the Agricultural Hall from April 17th to 27th next. A similar one was held about two years ago. The object in organising this exhibition is to bring surveyors into close touch with the latest developments and improvements in inventions and manufactures with which they are most particularly concerned in the discharge of their duties. The exhibition will be divided into five sections: house drainage, sanitary fittings, sewerage, sewage disposal and roads. Plans of spaces to let and full particulars can be obtained from Mr. Arthur May, 24 Bride Lane, Fleet Street, E.C.

A Suggested Ashford Improvement.—Through the combined efforts of the Ashford Urban District Council and the local Chamber of Commerce a scheme for the extension of Bank Street to Beaver, has been propounded. The scheme, as prepared by Mr. W. Terrill, the surveyor, suggests the construction of a new road to continue in a direct line from the end of Bank Street, thus securing a convenient approach to the suggested new station, in place of the railway company's proposal to locate the station entrance on the present bridge near the Victoria Hotel. This new road continues over the Stour, borders the Victoria Park, and terminates in Beaver Lane. Other new roads branch off and end facing Lower Denmark Road, and at various points in Beaver Road and Beaver Lane. The scheme, if adopted, will lead to the development of the whole of the estate included in the plan, and will provide a horter and much more direct route to the town from Beaver and places beyond.

Cannon Balls in Quarrying.—The United States Government recently sold a large quantity of old cast-iron cannon balls, which had been stored in the Charleston Navy Yard, to a Boston dealer, who has found a market for them among the Cape Ann and Quincy quarrymen. The first use they were put to was in place of steel wedges in splitting off large blocks of granite. The method pursued with the cannon balls is to start the block of stone away by a slight blast, and then between the quarry face and the block several of the smaller solid shot, usually the 4-in. sort, are dropped down into the aperture. Two men with crowbars give the blocks a slight shake, and the instant the block moves in the slightest manner forward the shots take up their purchase on the space made, when the large cannon balls, some measuring 12 or 15in. and weighing 200 or 300lb., are dropped into the top of the gap. Now the slightest outward jar by the levers on the big stone sends these heavy cannon balls dropping downward by their own weight, until, with an easy forward movement, the cube goes over on its face. These shots do away with any driving; their great weight in proportion to their size necessarily forces them downward, and their form prevents any chance of backward setting of the block. The cannon balls are also used as rollers, as they take up and go over the inequalities of the quarry surface and can be rolled in any direction without resisting, thus doing away with the old style wooden rollers. They are also used to smother heavy clearing-out blasts. Heavy rope mats are thrown over the surface where the blast has been set and these cannon balls are thrown on the mats.

New Companies.

George Glover and Co., Limited.

Registered February 21st to acquire the business now and hitherto carried on at 122 King's Road, Chelsea, and to carry on the business of dealers in dry gas-meters. Capital £60,000 in £1 shares. The first directors are D. T., G. R., and J. W. Glover.

Reid Brothers, Limited, Glasgow.

Registered in Scotland to acquire and carry on the existing business in Glasgow, South Africa and Australia, of merchants, commission merchants and agents, ironmongers, timber and machinery merchants, &c. Capital £80,000 in £1 shares. Registered office: 67 St. Enoch Square, Glasgow.

COMING EVENTS.

Wednesday, March 6.

BUILDERS' FOREMEN AND CLERK OF WORKS' INSTITUTION.—Ordinary Meeting of Members, at 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Evening and Council Meeting.

RUSKIN SOCIETY of BIRMINGHAM.—Mr. Richard Whiteing on "Ruskin's Moral Ideas in History," 8 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION. — Rev. H. J. D. Astley, M.A., on "A Ramble Round Thetford," 8 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration at Soap Works at 3 p.m.

CHURCH SANITARY ASSOCIATION.—Public Meeting, Westminster Palace Hotel, at 3 p.m,

Thursday, March 7.

CARPENTERS' HALL, London Wall, E.C.—Mr. John Slater, B.A., on "Celebrated Ancient Buildings," 8 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Mr. Charles E. Keyser, F.S.A., on "Sculptured Tympana of Norman Doorways," 8 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Prof. R. Elsey Smith on "Building Materials," 7 p.m.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—Mr. James R. Bell, M.I.C.E., on "Authoritative Rules for Unit-Stresses in Railway Girders," 8 p.m.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

ROYAL INSTITUTION.—Prof. Percy Gardner, Litt.D, F.S.A., on "Greek and Roman Portrait Sculpture"—II. 3 p.m.

CAMERA CLUB.—Mr. A. Burchett on "Light and Shade," 8.15 p.m.

Friday, March 8.

ARCHITECTURAL ASSOCIATION. — Special General Meeting to Consider the Committee's Scheme for the Establishment of Day Class, 7.30 p.m.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. James Lochhead on "The Decay of Building Materials," 8 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. Arthur T. Bolton on "Some Thoughts on Planning," 6.45 p.m.

ROYAL INSTITUTION.—Mr. W. A. Shenstone, F.R.S., on "Vitrified Quartz," 9 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Professor T. Roger Smith, F.R.I.B.A., on "Sanitary Building Construction and Planning; Soil and Local Physical Conditions," 7 p.m.

INSTITUTION OF CIVIL ENGINEERS (Students' Meeting).—Mr. Charles Johnston on "Sewage Treatment," 8 p.m.

Saturday, March 9.

DUNDEE INSTITUTE OF ARCHITECTURE.—Mr. Charles G. Soutar on "Ecclesiastical Architecture in Fifeshire," 7 p.m.

INSTITUTION OF JUNIOR ENGINEERS.—Visit to the Southall Station of the Brentford Gas Company to inspect the Carburetted Gas Plant, Inclined Retorts, &c., at 3 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to Archers' Hall and Craigmillar Park United Free Church, Edinburgh.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration at Beddington Sewage Farm at about 3 p.m., conducted by Mr. Thomas Walker, M.I.C.E.

Monday, March 11.

SOCIETY OF ARTS (Cantor Lectures).—Major P. Cardew on "Electric Railways"—I., 8 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. W. C. Tyndale, M.I.C.E., on "Ventilation, Warming and Lighting," 7 p.m.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 8 p.m.

PHILOSOPHICAL SOCIETY OF GLASGOW: ARCHITECTURAL SECTION.—Meeting at 8 p m.

BRISTOL SOCIETY OF ARCHITECTS.—Mr. Archibald Dawnay, A.M.I.C.E., on "Constructional Steelwork as Applied to Building," 8 p.m.

Tuesday, March 12.

SOCIETY OF ARTS (Applied Art Section).—Mr. Hugh Stannus, F.R.I.B.A., on Some Examples of Romanesque Architecture in North Italy," 8 p.m

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. W. C. Tyndale, M.I.C.E., on "Calculations, Measurements and Plans of Sections," 7 p.m.

Wednesday, March 13.

EDINBURGH ARCHITECTURAL SOCIETY.—Mr. J. Stuart Syme on "San Micheli and his Work."

NORTHERN ARCHITECTURAL ASSOCIATION.—Annual Meeting at 7.30 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. J. M. Brydon, F.R.I.B.A., on "The Work of Cockerell," 8 p.m.

SANITARY INSTITUTE.—Council Meeting at 5 p.m., Mr. Christopher Childs, M.A., M.D., on "Ventilation: Success and Failures of the Methods at Present in Use," 8 p.m.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration at Broake, Roberts and Co.'s Chemical Works, Stratford, at 2.30 p.m.

SOCIETY OF ARTS.—Mr. F. B. Behr on "The Proposed High-speed 'Monorail' between Liverpool and Manchester," 8 p.m.

Thursday, March 14.

ROYAL INSTITUTION.—Prof. Percy Gardner on "Greek and Roman Portrait Sculpture"—III., 3 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Meeting at 8 p.m.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Paper by Mr. E. W. Mountford, F.R.I.B.A.

Friday, March 15.

ARCHITECTURAL ASSOCIATION.—Mr. H. B. Measures on "Rowton Houses," 7.30 p.m.

EPIDEMIOLOGICAL SOCIETY.—Dr. J. T. R. Davison on "The Effects of Sewerage and Water Supply upon the Behaviour of Enteric Fever in Buenos Ayres"; Dr. N. P. Schierbeck on "The Enteric Fever Mortality in Copenhagen from 1828–1898," 8.30 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. W. C, Tyndale, M.I.C.E., on "Sanitary Appliances," 7 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. Bulkeley Cresswell on "Registered Architecture: an Analysis of the Society of Architects' Prescriptions," 6.45 p m.

Saturday, March 16.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration at the Sewage and Destructor Works, Ealing, at 2 15 p.m., conducted by Mr. Charles Jones, M.I.C.E.

CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Hay, best	per load	4	0	0	4	7	6
Sainfoin mixture ..	do.	3	10	0	4	10	0
Clover, best	do.	4	5	0	5	0	0
Beans	per qr.	1	10	9		—	
Straw	per load	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.	1	2	2	1	12	1
Colza Oil, English ..	do.	1	5	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	1	0		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels ..	do.	1	3	3		—	
Petroleum, American ..	per gal.	0	0	6¾	0	0	7
Do. Russian ..	do.	0	0	6¼	0	0	6½
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	3	1	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	5	6	1	6	0
Tar, Stockholm	per barrel	1	8	0		—	
Turpentine	per cwt.	1	8	3		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	86	0	0		—	
Iron, Staffs., bar.. ..	do.	7	0	0	9	10	0
Do Galvanised Corrugated sheet ..	do.	11	10	0		—	
Lead, pig, Spanish ..	do.	14	7	6		—	
Do. do. English common brands..	do.	14	17	6		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do., floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	10	0	7	0	0
Do. Mild Bars	do.	7	5	0	7	10	0
Tin, Foreign	do.	121	5	0	121	15	0
Do. English ingots ..	do.	125	10	0		—	
Zinc, sheets, Silesian ..	do.	21	0	0		—	
Do. do. Vieille Montaigne	do.	21	12	6		—	
Do. Spelter	do.	17	7	6	17	17	6

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel..	per load	3	0	0	4	0	0
Pine, Quebec Yellow ..	do.	4	7	6	6	0	0
Do. Pitch	do.	2	15	0	3	18	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	0

Soft Woods—*continued.*

		£	s.	d.	£	s.	d.
Do. Petersburg ..	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P. Std.	15	5	0	17	0	0
Do. do. 4th & 3rd	do.	11	15	0	13	5	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	15	0	15	5	0
Do. do. 2nd „	do.	8	15	0	14	15	0
Do. do. Unsorted „	do.	5	5	0	13	0	0
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	11	10	0	16	15	0
Do. White Sea ..	do.	10	0	0	14	15	0
Do. Quebec Pine, 1st..	do.	22	0	0	23	0	0
Do. do. 2nd	per P. Std.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0	12	15	0
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	7	15	0	10	10	0
Flooring Boards, 1in. prepared, 1st ..	per square	0	12	0	0	13	0
Do. 2nd ..	do.	0	9	3		—	
Do. 3rd &c. ..	do.	0	8	6		—	

Hard Woods

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba ..	per ft. sup.	0	0	4		—	
Do. Honduras ..	do.	0	0	3¾		—	
Do. Tobasco	do.	0	0	3¼		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0	0	4¾		—	
Do. African ..	do.	0	0	3½		—	
Do. St. Domingo	do.	0	0	6⅜		—	
Do. Tobasco ..	do.	0	0	3¼		—	
Do. Cuba ..	do.	0	0	5 1/16		—	
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks ..	do.	8	5	0	13	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American ..	per cub. ft.	0	3	1		—	

CONTRACTS OPEN.

URBAN DISTRICT COUNCIL of CARLTON near NOTTINGHAM.

TO CONTRACTORS.

The Council hereby invite TENDERS for the ERECTION of NEW ENGINE HOUSE and PUMP HOUSE at Carlton, near Nottingham.

Plans, specifications, &c., can be examined, and form of tender, and schedules of quantities obtained at the office of the Surveyor; Mr. R. WHITBREAD, M.S.A., Carlton, near Nottingham, on payment of the sum of Two Guineas, which will be returned on the receipt of a bonâ-fide Tender on and after FRIDAY, the 1st day of MARCH, 1901.

Sealed Tenders, endorsed "Tender for New Engine House and Pump House," must be delivered at the Office of the Council on or before TUESDAY the 19th day of MARCH, 1901, not later than SIX o'clock p.m.

The Council do not bind themselves to accept the lowest or any Tender.

By order of the Council,
JAS. KIRK CLARK,
Clerk.

Public Offices, Main Street,
Carlton, near Nottingham,
March 1901.

NORTON SCHOOL BOARD.

TO BUILDERS AND CONTRACTORS.

The Norton School Board invite TENDERS for the whole or any portion of the works required in the ERECTION of a NEW SCHOOL at Norton Lees.

Persons desiring to Tender are requested to make written application to Mr. JOSEPH NORTON, Architect, Alliance Chambers, George Street, Sheffield, on or before TUESDAY, the 13th MARCH, 1901, accompanied by a deposit of One Guinea, to be returned to those who submit a bonâ-fide Tender in the manner and at the time specified.

The Board does not bind itself to accept the lowest or any Tender, and no allowance will be made for estimates.

Tenders will only be received on the printed forms and in covers to be obtained from the Architect, and must be delivered at my Office not later than the 25th MARCH next.

SAMUEL ALLEN,
Clerk to the Board.

20 Bank Street, Sheffield,
February 1901.

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17½×3×2	8 11	8 2	14 6
17½×3×1½	6 10	6 3	10 9

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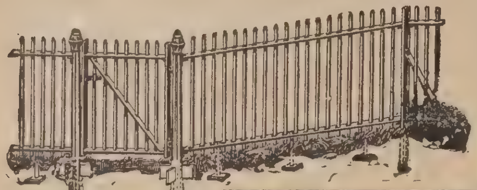

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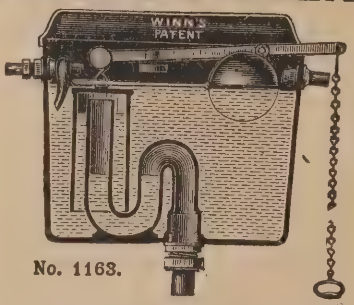

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

March 13, 1901.
No. CCCXVIII.

Effingham House,
Arundel Street,
Strand, W.C.

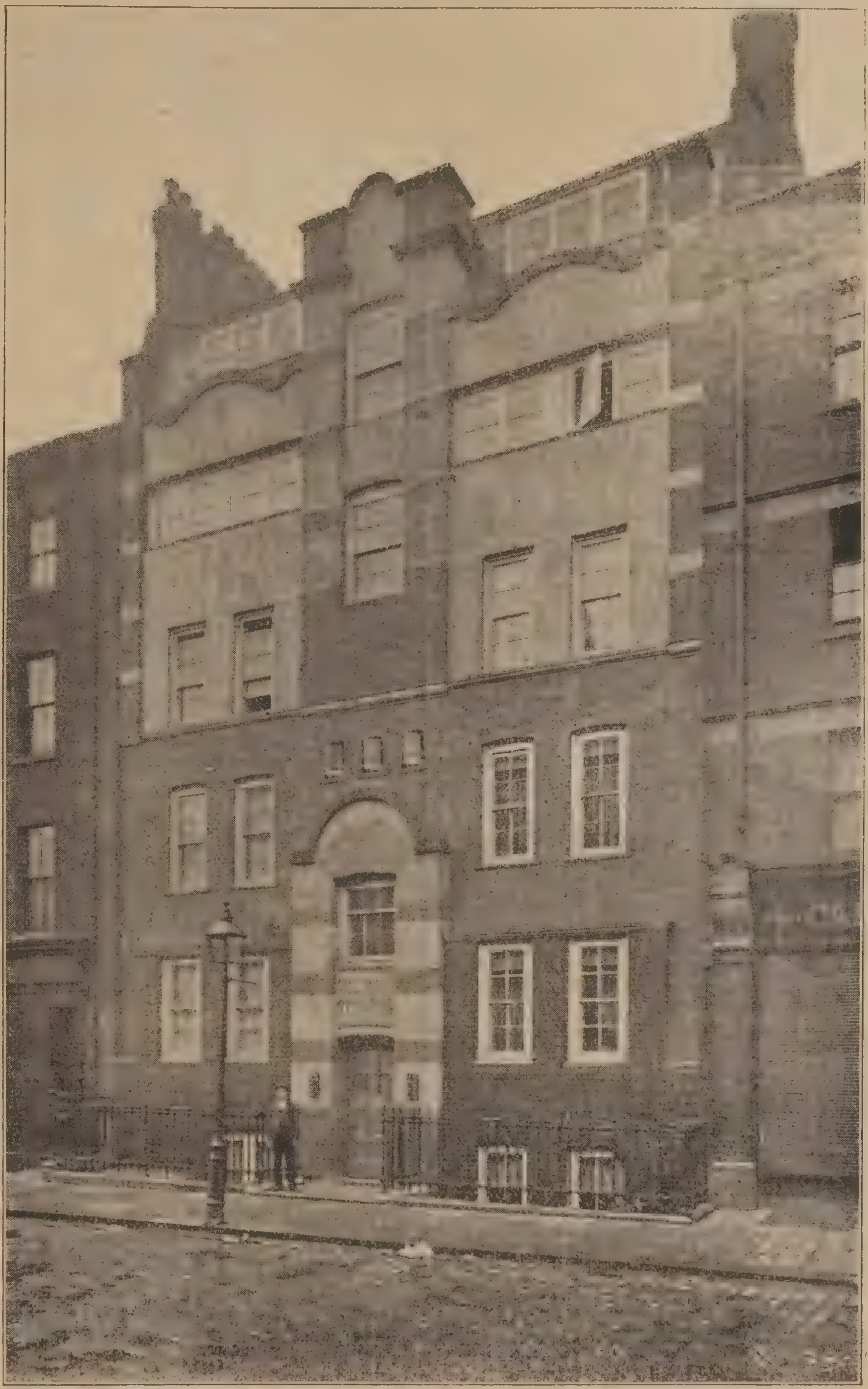
An Architectural Causerie.

To Our Readers. We have to inform our readers that the proprietorship of this journal has changed hands, and that several important alterations will shortly be made. Of these we can say no more at present than that they will add considerably to the interest and value of the Builders' Journal, and we must ask our readers to wait till next week for full particulars.

Belmont House, Candover Street, W. This house, named after the battle of Belmont, has two self-contained flats on each floor, comprising entrance lobby, sitting-room, bedroom, kitchen and the usual offices, with coal cellars in the basement. The elevation is in buff-coloured salt-glazed bricks, Portland stone, red and blue Staffordshire bricks, and green and brown cement work, the whole of the joinery being painted white. The building was carried out by Mr. A. A. Webber, contractor, of 47 Mortimer Street, W., and the sanitary and drainage work by Messrs. Thomas J. Boulting and Sons, of Union Street, W., the whole being completed under the supervision of the architects, Messrs. H. Fuller Clark and Percy A. Boulting, of John Street, Bedford Row, W.C.

Newport Castle. Like many another historical building, the old Norman Castle of Newport, in Monmouthshire, has passed through many vicissitudes, and now, as a climax, it is to come under the hammer. For many years it has been used as a brewery, a piece of vandalism only equalled by the neglect which the Corporation have shown in regard to the whole site. The castle dates from about 1130, and is of sufficient merit to warrant every care being taken for its preservation, but with wanton heedlessness the Corporation allowed it to be used for the ignominious purposes of a brewery, and at one time even permitted a large music-hall signboard to flaunt itself across the top of the keep. Newport Castle abuts on the river Usk, to which it lies parallel, and there was formerly a space in front of it which should have been preserved as its grounds, thus providing a proper setting for the building and forming a pleasant green place in the centre of the town. Now there is talk of the Corporation buying the castle, but it is rather late in the day to think of this, for they have permitted the surrounding ground to be so covered with hotel and commercial premises that the old Norman stonework almost touches the new red brick—in fact to no small extent the castle is dominated by the new buildings, and though its river front remains untouched the other portions are hidden away. Nowadays many are prepared to pooh-pooh the person with any trace of artistic perception, but here is a case in point where the lack of it has resulted in a fine and interesting Norman castle being treated in the most disgraceful manner.

The Architect of Everyday Practice. Instances are constantly recurring of the decay which sets in when the architect is becoming settled in his practice, a decay which is the almost inevitable result of contact between modern commercialism and the art of architecture. In their younger days architects are all afire with the endeavour to catch the spirit of the old masters: they sketch and measure, examine and compare, and dream of the time when they shall be the happy creators of noble buildings. But little by little the image becomes blurred, and what was first seen with clear vision—a strong demarcation between good work and bad—becomes increasingly obscured by the shadow of practicalities. True, business is business and a man must live; but it is much to be regretted that so many architects who showed promise in their youth should, when they settle down in practice, throw over their early ideas and become slaves to a purely commercial creed. Architecture is changed from a profession of truthful building to a sluggish system of trade. We do not wish to appear unreasonable or unobservant of the practical requirements of to-day, but we deplore that it is so common to find the true zeal gone when the architect nears middle age—or before. Perhaps some reason for this may be found in the fact that many men seem to think that their education is over when once they start in practice: they are then the finished product. No greater mistake could be made. It is at this period that the opportunity offers of carrying into effect motives which actuated the early enthusiasm. The Royal Institute includes among its members dozens of men with large practices whose buildings dishonour the name of architecture; and though the decay to which we have referred is certainly not entirely responsible for this, still a great improvement would have been effected had these men not degraded their art when actually engaged in practice. When architects have the courage and capacity to deny the right of "commercial needs" to cripple their art, then we shall have more numerous examples of good building.



BELMONT HOUSE, CANDOVER STREET, LONDON, W.
H. FULLER CLARK AND PERCY A. BOULTING, ARCHITECTS.

THOMAS H. MAWSON.

SMALL GARDENS.*

By THOMAS H. MAWSON.

WHEN your secretary asked me to read a paper before you he suggested that I might deal with one of the many subjects touched upon in my recently-published book, "The Art and Craft of Garden Making." Knowing something however of architectural practice in the Midlands and the revival of interest in the planning of small houses, and realising that in some ways my book (owing to the exhaustive number of topics) must of necessity be brief and concise, I did not deal very fully with gardens suited to this class of house, and I thought my paper would be much more useful if confined to the treatment of gardens surrounding cottages and small houses.

One of the most pleasing signs in the architect's profession is the recognition of the fact that cottage architecture to be truly successful cannot be confined to the planning and designing of the house and elevations; but must have some control over the interior decoration (or what is oftentimes better the avoidance of decoration); and with the design and arrangement of the furniture; the control of the approach to the house and also the garden, or at any rate that portion of the garden which immediately surrounds the house. I am afraid that in many cases the bare recognition of, or assent to, this principle suffices, and that whilst we see here and there sparsely distributed signs of the approaching architectural millennium, we are not quite there yet, and I fear that some of you, when I suggest the addition of a technical knowledge of garden-making to the already long list of subjects through which you have to conduct your studies, will almost hope that I do not succeed in proving my case, and yet I can promise that if I succeed I shall introduce you to a subject which shall yield you greater delights than any you have yet tasted in the field of design; and I may add to the younger members of the profession, that you will soon realise that to a very large extent it is a mine which has not yet been fully worked or explored, one where you can within certain limits express the completeness of your own ideas, and determine what character of design shall rule in the making of a garden. I agree there are greater drawbacks and discouragements to encounter in the garden than in the house and its interior arrangements or fittings, as so much more depends upon the aptitude and intelligence of the gardener who is to put your ideas in practical shape (a very worthy man in himself according to his light and his training, but whose ambition is often measured by the local Flower Show exhibits) than upon either the builder, decorator, or furniture maker whom you can restrict and restrain and guide by plans, details, designs, or sections.

To make myself quite clear I may say that the cottage residence which I have in my mind would range from the small £40 semi-detached, with its plot showing a frontage of 60ft. and a depth of 100ft., to the small house with three entertaining rooms and six or eight bedrooms, stabling for two horses, and two acres of ground.

Before I proceed to give you a few hints which I hope you may find of a practical character I wish to show, first that you cannot really successfully plan a cottage residence without deciding the principal features comprising the garden scheme. The designer of the cottage ought in any case either to design the complete garden scheme, or otherwise agree to allow of an exchange of opinion between himself and whoever may have to plan and carry out the garden. Even supposing the landscape gardener to be an artist with insight into, and in full sympathy with, true architectural dignity and expression, the architect has much the best opportunity of making a successful and complete plan. I also wish to show that if the architect does not undertake the designing, the landscape gardener in all probability would not be asked to do it, and that as a consequence the garden setting to the house, over which so much time and thought had been spent, would eventually be the joint production of the local jobbing gardener and the client.

Respecting the first of these three statements, with whatever feelings or sentiments you may be inclined to approach gardens I am perfectly convinced that in refusing to design the house as well as the garden I have lost some fine opportunities of gaining that wider outlook which it is so necessary the designer should achieve; and I am free to confess that any grasp which I may have of this principle of unity and completeness, which should rule not alone in gardens and house but should underlie the character of the whole street—nay! of the whole city. I say then that this habit of viewing scenes in their broader aspect has largely resulted from the fact that I have been brought into connection with a considerable number of clients who, having purchased their site years before they were prepared to build, or even to consult an architect, have nevertheless wished to do the necessary planting, and in some cases to lay out the outer fringe of the gardens. I have thus been compelled to consider the place as a whole, and to plan the houses in a way which I thought would best suit the site and my client's probable requirements. In this way I must have prepared scores of plans for houses of all sizes, and I can assure you it has been a fine study. My reason for venturing this personal experience is because I feel that I am quite right in saying that it is just as necessary for the architect to realise the proper connection between house and garden as for the garden designer to obtain a grasp of the character of the design and the planning of a house. I need only emphasise this by pointing out that the approach to a house, whether in the form of a drive, avenue, a simple court or merely a walk, is the first impression a visitor gains; it is generally the most important detail in the garden scheme, and is at the same time the introduction to the house itself.

In passing I would like to mention another great factor which combined with others has tended to broaden my vision and educate me to look beyond merely limited prospects; it is the laying-out of building estates where the desired aim and object was to accomplish a worthy complement to pure air and pleasant surroundings without desecration and disfigurement; yielding pleasure to the beholder and profit to the proprietor. Architects who wish to lay out gardens would do well to cultivate this faculty of studying nature with a view to the attaining of aggregate effects; a grand antidote against mere sleight-of-hand draughtsman proficiency and commonplace invention, and against a too pedantic academical education. I am well aware of the ever-increasing amount of subjects that a modern architect has to keep pace with, but this faculty is in a great measure intuitive (although the foundation of it may be laid in the student's mind and incentives and encouragements offered to continue), and when once acquired has the tendency to soothe rather than irritate the tired brain and jaded spirits. This is a point which I am pleased to be able to say is being emphasised and reiterated by all sound reliable guides in architecture, although not perhaps entirely in the exact special direction now suggested, notably by Mr. W. H. Seth Smith in his presidential address to the Architectural Association.

An architect is really the fittest man to design the garden, and I think it will be generally conceded, even by landscape gardeners, whatever gifts he may possess, that a circumscribed garden is seldom a success unless a formal treatment (why so termed I do not know) is applied. Mr. Kemp, who wrote that excellent practical work, "How to Lay Out a

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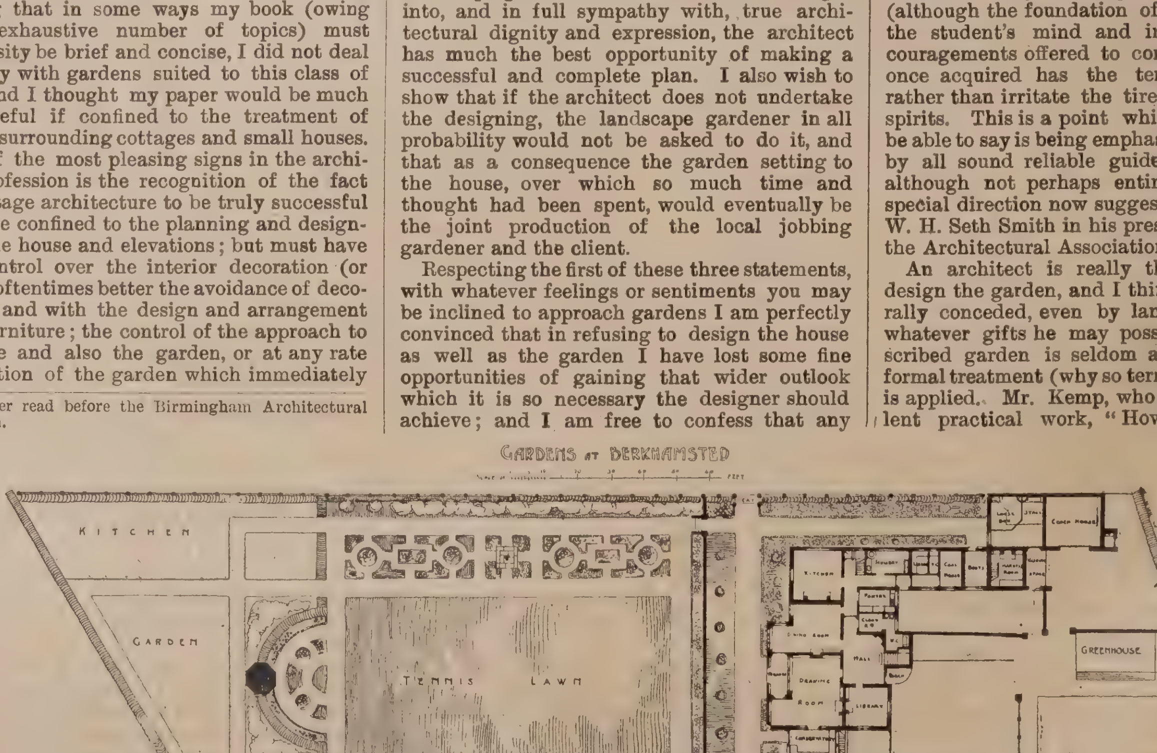
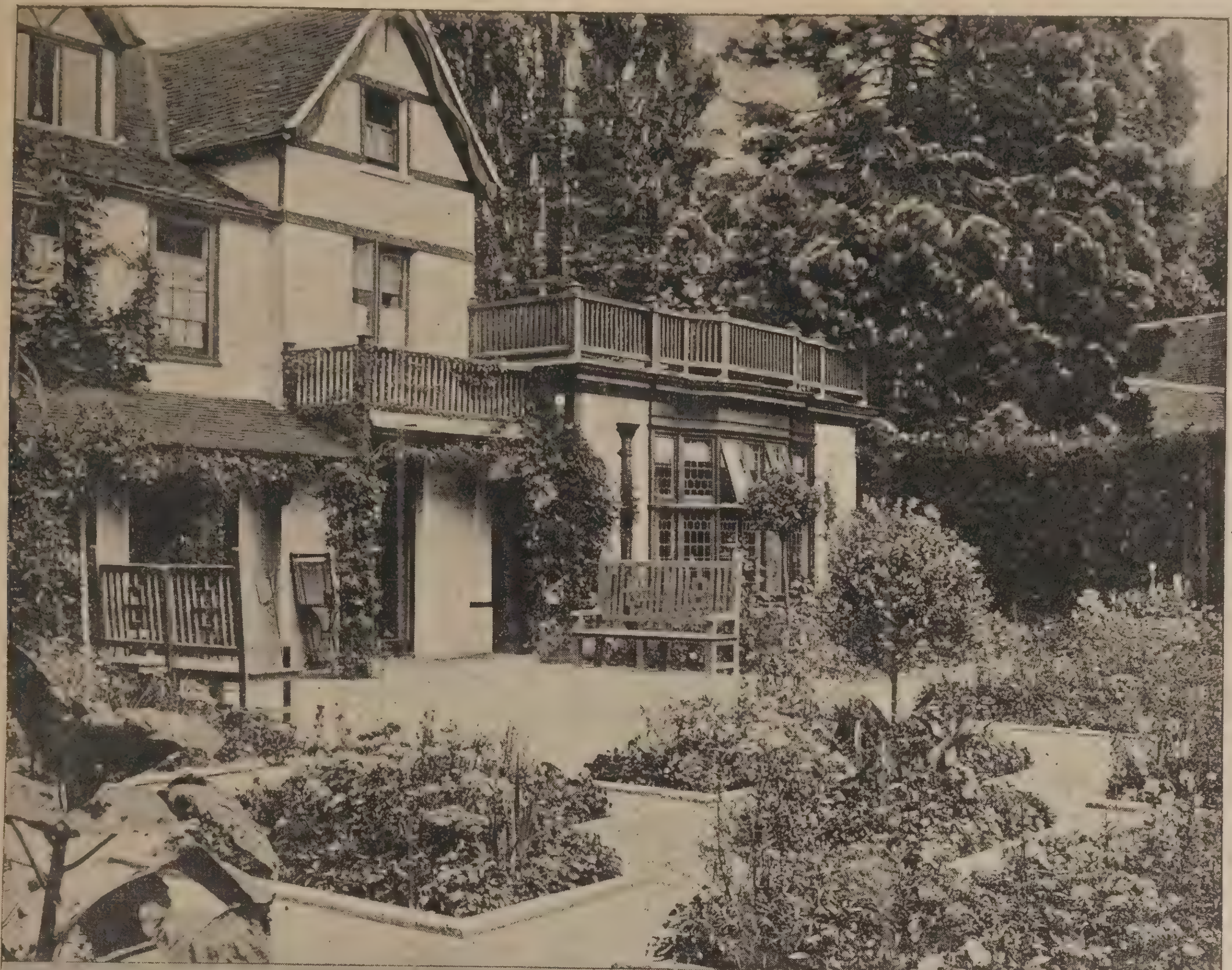
* A paper read before the Birmingham Architectural Association.



PLAN NO. 1.

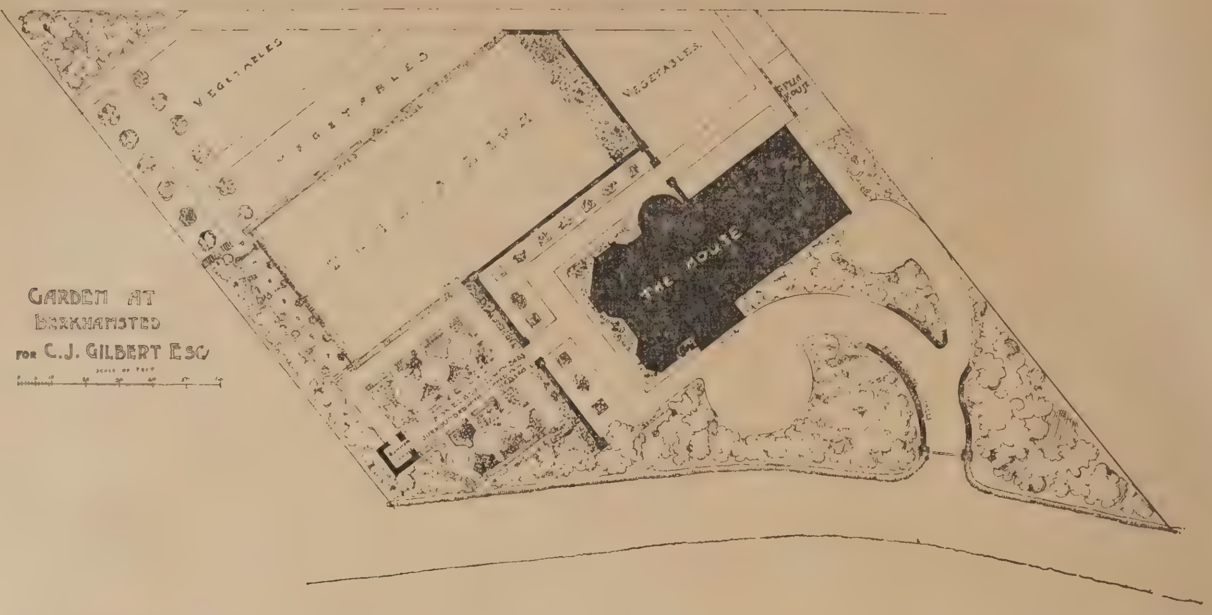


PAVED GARDEN COVRT AT WRAYSBVRY FOR G.M. FREEMAN. ESQ. Q.C.

Garden," realised this. The advantage of this method is that the garden design is brought into direct relation with that of the house; that in fact a garden becomes a necessary outdoor extension of the family requirements and of the entertaining arrangements: one set of apartments under cover, the other open to the interchange of shine and shower and of each season's respective display. The relation of this series of garden apartments to the house would be more ably grasped by the person who had planned the house and knew the relative use of one room to another. The ingenuity necessary for the planning of the house would assuredly find larger liberty and unfettered scope in controlling the whole. An architect occupies a much better position than either the landscape gardener or anyone else to realise a successful garden; for if he had to be responsible for the whole he would take care that the only place in which a Maréchal Niel rose would grow is not occupied by the basement area, that the steps to the beer cellar do not cut into the only piece of ground suitable for a flower garden, and that the coal shute is more than 3ft. from the door of the principal entrance; also that the garden front was as far removed as circumstances would allow from the entrance front, and that the kitchen offices and stables (whilst helping the general effect) were so placed as to allow them to be screened from the private parts of the garden. But perhaps the greatest advantage which the architect possesses lies in the fact that he has the control of the entire sum which his client is prepared to spend. I happen to know from experience what this means, for time and again have I found, when called in to advise, after the house was partly completed, that the balance available for laying out the garden was totally inadequate for the purpose, with the consequent result that the garden was in a large measure a failure. When interests are divided one is prepared for this kind of thing; but if one realises that half of the money spent on, say, the barge boards, finials and bristling insincere ornamentation would have given you some chance in the garden, one cannot help regretting the absence of some controlling mastermind who, with perfect unanimity of purpose and comprehensive grasp, had had the spreading of the money over the larger area. Now do not misunderstand these remarks, for I quite sympathise with the architect who must have realised that in the incapable hands of the jobbing gardener, who in no wise conceives the house and garden as one composition, the less money allowed for the garden the better, and that it was much better to make the barge board a counter attraction to the monkey-puzzler so carefully planted in the little circle in the centre of the carriage turn. The last consideration under this heading is that if you do not undertake the work it will fall into incompetent hands; or if a competent designer is engaged by the client it is in the majority of cases because he has a reputation for a set form of garden design or speciality which, however advisable under the most favourable conditions, may be totally out of place here, but which the proprietor is persuaded, as mankind are by the foibles of fashion, is the only correct form under all circumstances, and which, unless the architect can prevent, he is determined to have. There is more than one garden designer in this country who has realised the inconvenience of a prevalent fashion brought about by the dictatorship of some temporary popular, bumptious capability Brown, and the expressed disappointment of his client when he proposes to treat the ground in a manner characteristic of the surroundings. Architects, it is understood, in dealing with the ground are not expected to conform to a set of ideas which are well known to be foreign to their profession.

Having given you my reasons why you should undertake the designing of small gardens I now wish to state a few necessities and qualifications. In the first place a proper survey with accurate levels is needed, and I can assure you that you will need to lay out a very large number of gardens before you can dispense with this necessary operation, even to the extent of making a preliminary sketch; for to be in any way successful the plan must be arranged to fit the ground and give expression to its contour. You must also be able to judge when ground requires draining, and, having decided upon this necessity, be able to arrange it in an efficient and economical way. Judging from many schemes which I have seen for dealing with surface water I am inclined to think that you could easily spend on land draining a sum large enough to lay out in a satisfactory manner the whole of the ground. You must know a little about soils; this is a question which troubles would-be garden designers greatly. Now for the horticulturist pure and simple; this is a most important branch of study and research, but for the garden designer there are a few sound rules which will meet his requirements whether the soil is wet or dry, light or heavy, clay or gravel subsoil; whether the soil lies on limestone or in chalk. If the soil is wet, good drainage should remedy it; if clay good drainage and the admixture of burnt clay and town refuse. Good trenching will usually be beneficial if light and sandy, with an admixture of clay or cow manure; as a rule however you may say that a dry subsoil is best for a garden.

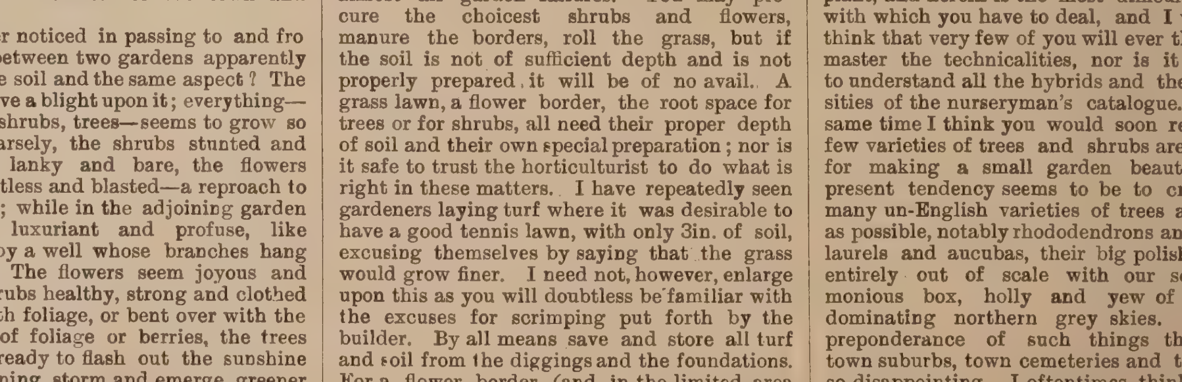
The first great desideratum is unity and cohesiveness, some great controlling power to marshal and organise the petty clevernesses, talents and gifts, and make for and lead up to one ultimate end. The lack of this quality makes 99 out of every 100 cities so disappointing when viewed from an eminence—such a motley jumble of points, angles and pinnacles, style and no style. Almost all our national, municipal and parochial energies and aims lack this socialistic quality; there is abundant individual clever-



ness. But of all matters, says some one, do not interfere with the liberty of the subject in his garden. That certainly is not my motive, but I would by all the powers of persuasion try and induce the subject to use his liberty not merely to the gratification of his individual preferences, but to a certain extent to sacrifice these to obtain an aggregate effect. For instance, a fortunate possessor of a house in a city or suburb where vegetation is none too abundant and brick and stone largely predominate, with a fine walled-in geometrical garden faultlessly laid out with neat box-edged beds, vases, and all that goes to make such a garden a success. But in taking a summary view of his surroundings his eye longs for some counterbalancing mass of green, and to remedy this he sacrifices a part of his garden, and plants a mass of hollies, or limes, or beech to tower above the boundary wall to the gain of the outside beholder, the public, and at a loss to himself—that man is a benefactor to the town and neighbourhood.

Have you ever noticed in passing to and fro the difference between two gardens apparently having the same soil and the same aspect? The one seems to have a blight upon it; everything—grass, flowers, shrubs, trees—seems to grow so tardily and sparsely, the shrubs stunted and starved, trees lanky and bare, the flowers shrivelled, scentless and blasted—a reproach to its neighbours; while in the adjoining garden everything is luxuriant and profuse, like fruitful trees by a well whose branches hang over the wall. The flowers seem joyous and radiant, the shrubs healthy, strong and clothed to the roots with foliage, or bent over with the added weight of foliage or berries, the trees healthy, ever ready to flash out the sunshine after the darkening storm and emerge greener and purer; the ivy, clematis, honeysuckle, jasmine and roses peep in at the windows and flower in picturesque masses; the grass does not cake or languish and burn in drought, but yields to the eye that refreshing, restful, compact aspect so desirable. But what is the reason for this contrast—this difference? You would be able to tell me almost at once if there were two adjoining houses in a correspondingly opposite condition, both apparently built with the same hand and with a corresponding amount of care; the one looking singularly happy, "suitably received into the bosom of things" as some one has said, the other, in spite of suitable window adornments and owner's care, decrepit and unhappy. Your trained eye would at once glance at the unlevel joints, the slightly irregular ridge finials and chimneys and other lines slightly out of the perpendicular—points scarcely discernible to anyone else—and you pronounce the verdict "bad foundation." This foundation failure—unprepared soil—is the cause of almost all garden failures. You may procure the choicest shrubs and flowers, manure the borders, roll the grass, but if the soil is not of sufficient depth and is not properly prepared it will be of no avail. A grass lawn, a flower border, the root space for trees or for shrubs, all need their proper depth of soil and their own special preparation; nor is it safe to trust the horticulturist to do what is right in these matters. I have repeatedly seen gardeners laying turf where it was desirable to have a good tennis lawn, with only 3in. of soil, excusing themselves by saying that the grass would grow finer. I need not, however, enlarge upon this as you will doubtless be familiar with the excuses for scrimping put forth by the builder. By all means save and store all turf and soil from the diggings and the foundations. For a flower border (and in the limited area devoted to flowers in most suburban gardens the expense would not be great) it is a good plan to lay at a depth of about 2ft. a layer of broken brick or some absorbent material, provided that the soil-water drainage-level is deeper; then to overlay this with a covering of ashes, and then to overlay this to a depth of about 21in. with soil of desirable lightness; if too heavy it should be mixed with sand and should have abundant vegetable matter and fibre in it, such as the decayed turf which close-grown pastures yield. For trees and shrubs a depth of from 1½ft. to 2ft. is needed, with a plentiful admixture of the fibrous turf loam, though it need not be so richly manured as the flower border. Grass also requires a depth of soil not less than 3in., with a well-drained bottom properly prepared. Of course, as before stated, different soils, heavy or light, clayey or sandy, require different treatment; but although the first outlay may be greater, it is cheapest in the end. "Prevention is better than cure."

Of course it is necessary to know what to plant, and herein is the most difficult problem with which you have to deal, and I venture to think that very few of you will ever thoroughly master the technicalities, nor is it desirable to understand all the hybrids and the monstrosities of the nurseryman's catalogue. At the same time I think you would soon realise how few varieties of trees and shrubs are required for making a small garden beautiful. The present tendency seems to be to cram in as many un-English varieties of trees and shrubs as possible, notably rhododendrons and common laurels and aucubas, their big polished leaves entirely out of scale with our sober harmonious box, holly and yew of the predominating northern grey skies. It is the preponderance of such things that makes town suburbs, town cemeteries and town parks so disappointing. I oftentimes think that the quiet spacious dignity of the Harrogate Stray would be preferable to many of the tortured



hillocky, unnaturally-planted parks nowadays so common.

In the few architects' gardens I have seen I notice that they usually plant shrubs, both formal and others, in the grass, evidently expecting them to thrive as they do in properly prepared and tilled borders. This is a mistake, and for several years at the least, until the shrubs are thoroughly established, all grass and weeds should be kept clear of their roots. I know how much better grass looks when it sweeps up to the stems and trunks of the trees, or the leaves and boughs fall over in a fringe upon the sward. How difficult it is to convince clients of the dignity of mown grass, and how often do we see the majestic trunks of a fine group of cedars or timber trees muddled up with the inevitable fussy rhododendrons.

It is in the direction of flowering plants rather than shrubs that variety is to be sought after, and for these you must, I fear, rely upon the nurseryman's knowledge of things, simply controlling the shape of the beds and borders in which they are to be planted, and, perhaps the passing of the few varieties which are essential to the architect's garden, some of which I will enumerate later.

Now, respecting the planting of hedges, screens, &c. Before you attempt to do anything satisfy yourself that what you plant will grow. You may wish for a yew hedge, but it may grow so indifferently in the neighbourhood that you would get more effect out of common privet. Having made up your mind as to the character of the shrub or tree you wish to plant you will find it comparatively easy to discover whether or not it will grow in the neighbourhood, and, if not, what would form the best substitute.

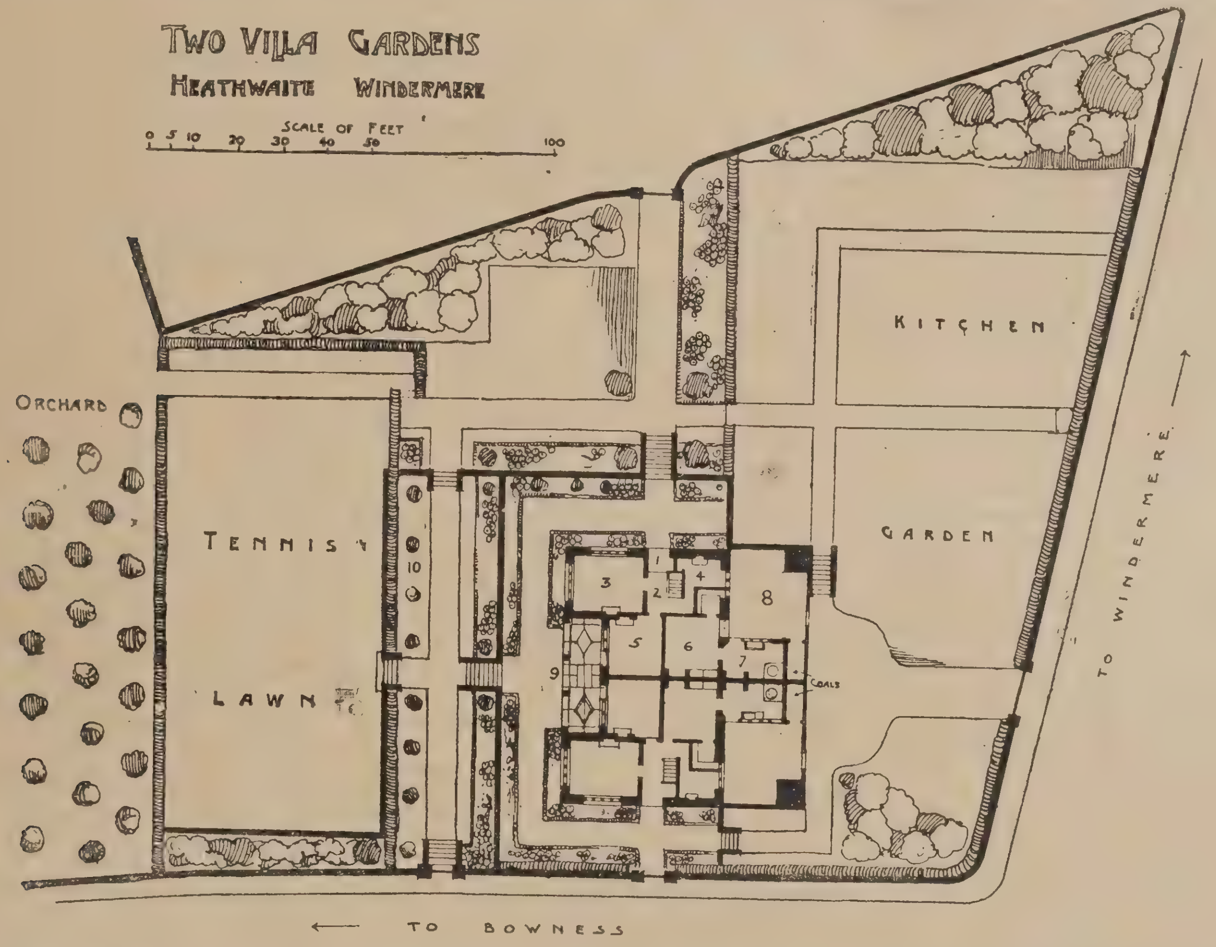
But before we discuss any more technical difficulties we had better consider broad principles, which it is necessary to grasp before arranging your garden plan. I have already stated that the controversy which has been waged between garden designers and architects does not apply to small gardens, for all are agreed on the general principle of formality, although not agreed as to the detail by which this formality should be expressed. The aim and purpose of a small garden are totally different from gardens of large extent—the former expresses the sympathies, pursuits and refinements of the home life; the latter, in addition to this, is first and foremost a mark of rank and opulence. The managing head-gardener in the one case is the master or mistress of the house; presiding over the other is the skilled horticulturist, whose permission my lady must ask before she may cut a flower. The small garden is probably the only form of rural pursuit open to its owner, and yields in relaxation and reflection a delightful change to the "sturm and drang" of his everyday existence.

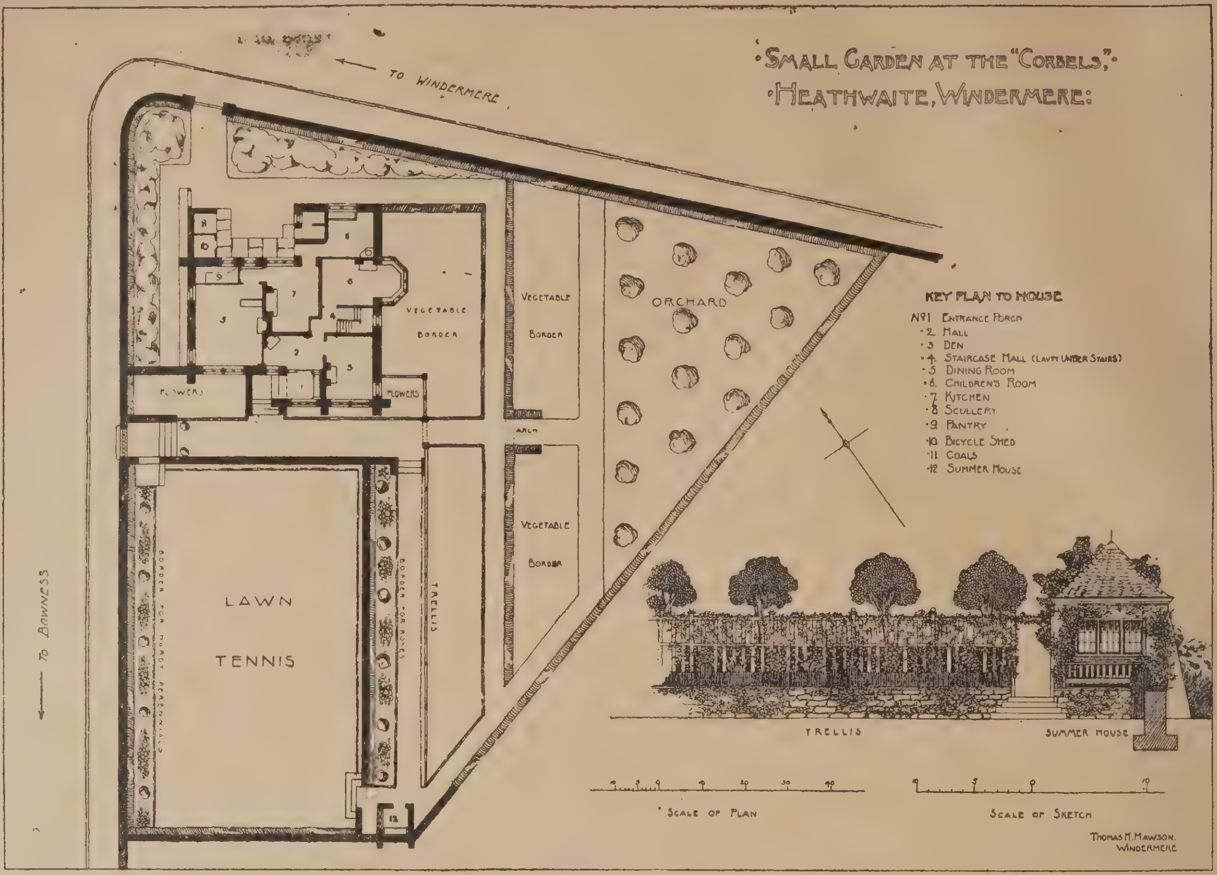
In a garden there are so many things which are considered necessities, some beautiful in themselves, others difficult to classify, adorn and harmonise with an all-pervading sense of true garden effect. There are the tennis lawn and summer-house; the rose border, where too often size of flowers seems to be the chief attainment—lanky bare sticks—during more than half the year, the roots covered with untidy manure, from which the eye instinctively turns to find delight in the rich green of the despised herb border of parsley and sage. The greenhouse, where can be grown geraniums and decorative house-plants in winter and in spring, where one can grow tomatoes in the summer and show chrysanthemums in the autumn. The little garden frame, which ensures a supply of sweet violets throughout the winter months; a potting shed also and garden house, and a paved shed with a big block for chopping firewood, when from stress of weather the proprietor has nothing else to do; in fact, so many interests are to be catered for in this class of garden, and such a host of details on which you can exercise your ingenuity for garden effects, that to the man of sense and refinement make-believes become grossly irritating. What he wants is a purpose-like garden.

There are two considerations I would like especially to impress upon you. First, the desirability of disabusing your mind of your preconceived notions of the art which is said to conceal art, and, on the other hand, the value of plain surfaces and of definite unhesitating lines. In ignoring the latter it is quite true that you may be able to cover your lawn with trees and shrubs from every part of the temperate zone, just as you may fill your drawing-room with all sorts of bric-a-brac; in both cases you may, instead of securing a sense of restfulness, succeed in obtaining an aspect of fussiness. In laying out definite lines you may not get quite so many of those little surprises so much sought after in gardens, and you may not even be able by the exercise of a little trick or two to make your neighbour's garden look as if it belonged to you, but you will be saved the humiliating knowledge that your garden is a fraud and that your visitors are sure to find it out.

So much depends upon locality, materials available, the importance of the house and the amount of money at your disposal, that the question of fences cannot be profitably discussed in this paper; but I would like to say that split oak, which lends itself to such a variety of treatment, is at once one of the simplest and at the same time one of the cheapest forms of fencing; and I would suggest that if we could in this country use in conjunction with this fence the trained lines of limes and laburnum as they are used in Holland and France, we could obtain some delightful effects.

Holly is, of course, an admirable hedge shrub, so are beech and thorn, but in each case the wished-for effect is slow; privet makes a hedge very quickly, but it must be out of the reach of horses and cattle, which are very fond of it. The fence which is least permanent, and least desirable, is the strained wire or iron hurdle. We may now consider more fully the placing of the house on the ground so as to make the most of it. Where the extent of ground is strictly limited, as is invariably the case when you are building a small house, the greatest mistake you can make is to cut up the ground too much with drives, &c. This point cannot, in my opinion, be too strongly insisted upon. If your site is well chosen, the public highway will be along the west, north, or eastern boundaries, preferably the north; and just as you would, for the sake of aspect, arrange your living rooms from east to west, so you should see to it that you have as much land as possible on these sides. Now I hold an opinion which I must admit is at the present time, even among architects, very unpopular—namely, when the plot does not exceed, say, two acres drives are seldom needed, and every real require-


TWO VILLA GARDENS
HEATHWAITE WINDERMERE



PLAN NO. 2.

ment can be met by a simple carriage court, connecting directly with the high road. This court you could probably enclose and pave for a less sum than you would otherwise spend on the drive. If the stable could be arranged to the west side of this court and the small kitchen, garden and kitchen offices also arranged to this side, you would then have all the more ground at your disposal on the sunny side of your house. Plan No. 1 will give you some idea of the effect which can be obtained by a simple square court such as I have advised. Where the plot of ground is less than half an acre it will be seldom that even a carriage court can be arranged with advantage, but it would be comparatively easy to give examples in which the court arrangement will be the making of the place. On the other hand there is no court or drive to the house shown on plan No. 2. Where a drive is really necessary make it as direct as possible. If the ground is fairly level and the junction with the main road is convenient, a straight road treated as an avenue would give the best effect; but if the ground is rising and of irregular contour, then perhaps a curved drive would be the only one possible. There is something very pleasing in following the sweeping lines of a drive or walk encircling the base of a natural knoll or mound, and this has probably led one section of the modern landscapists into manufacturing hillocks and mounds in order to multiply the curves and wriggles.

Above all things do not make your gardens too large; remember that perfect keeping is the soul of a small garden. I can assure you that you will have considerable difficulties with your clients on this score. Find out if you can what labour your client intends to employ: if a man only two days a week, a quarter of an acre would be sufficient; if he can employ a man and a boy the garden might be as large as one and a half acres, or if no glass, as much as two acres. You ask, What shall I do with the remaining portion? If you have sufficient for a paddock for the pony you could not put it to a better use, and in any case you can never go far wrong in planting an orchard; in fact, I always look upon an orchard, with its grass from late winter to spring, broken up with colonies of snowdrops, crocuses, and daffodils, the trees in spring covered with masses of bloom and later the boughs bending under their rich load of fruit, as the most delightful part of the garden. You also invariably require to plant for screen and shelter, and this alone would reduce the amount of ground to be kept under cultivation. There is also the arrangement of the wilderness or wild garden—a piece of ground planted thickly with silver birches, beech, oaks, and Scotch firs; hazel, dogwood, the spindle tree and the savin, with spaces left for daffodils, wood hyacinths, foxgloves and Solomon's seal; having a meandering path running through it or (which I think still better) a broad grass path with heather, vaccineums, mahonia, gaultherias, and other suitable flowering shrubs forming a border on either side; or if very much shaded, with masses of fern or bracken on either side.

If your site has been well chosen, the ground will slope away from the house; if it does so in a southerly direction you will have a very sunny garden. This fall of ground suggests terracing, an operation which in a suburban district requires much more careful arrangement and adjustment than would be the case in open country, where as a foreground to charming distances the balustrade serves as a frame or setting. In the case under consideration the eye should be induced to rest on the garden. Now, there are, roughly, three ways of terracing —by walls, by grass slopes, and by planted slopes. Of the three, walls are the most satisfactory. A balustrade and expensive stone dressings are seldom appropriate to a small garden, except the house be severely Classic. Terrace walls—maintenance considered—are probably the least expensive, and to my mind should never be built as if they were to remain naked; I can never think of a wall as so many yards super. of Ruabon or Accrington bricks, but as a wall of the most delightful greenery. If you are in a brick country, any good hard brick the colour of which approximates to that of the house would answer; if in a stone country, rough rubble. If possible, the pointing should be omitted so that toadflax, house-leeks, &c., could grow in the crannies. The coping, if dressed, to have very simple mouldings. In the houses belonging to myself and my brother the walls cost under 5s. per yard super., and I think they look just as well as if we had spent three times the money. Grass slopes are practically impossible if the batter be less than 1 to 2, allowing a step of 12in. by 6in.; but whatever batter you adopt for one bank should apply to the whole of the slopes in that part of the garden.

Planted slopes such as the one at Rydal Mount are very charming, but the great drawback is that you have to wait many years for the result. You can, however, obtain a very effective planted slope with mahonia, which if fairly successful will completely clothe the bank in two years, and also by planting *Cotoneaster microphylla*, which would clothe the ground in the same time. The one point to bear in mind when laying out batters is to avoid diminishing lines; as, for instance, when you make a sloping walk at the end from the upper to the lower terrace. In deciding the width of your higher terrace you will need to bear in mind what I have said about cutting off the view of your ground below; do not foreshorten your ground. Nothing gives more character to a garden than the form, arrangement and quality of its grass lawns; and nothing is more refreshing than to look out of your room window on to a lawn perfectly formed and kept. To secure this perfect form is, I admit, a difficult task. I have often felt thankful that a tennis or croquet lawn was considered a necessary part of the scheme, and wherever possible I place this in front of the most important windows, or if it is not possible to so place it, then a pleasing vista may be obtained across it. The terrace next to the house should be treated simply, but with a certain amount of colour from flowers, and should certainly have a border next to the house in which to grow climbers. I am fond of broad paved walks on a terrace next to the house, with a few quaint shrubs either planted permanently in beds or set out in tubs.

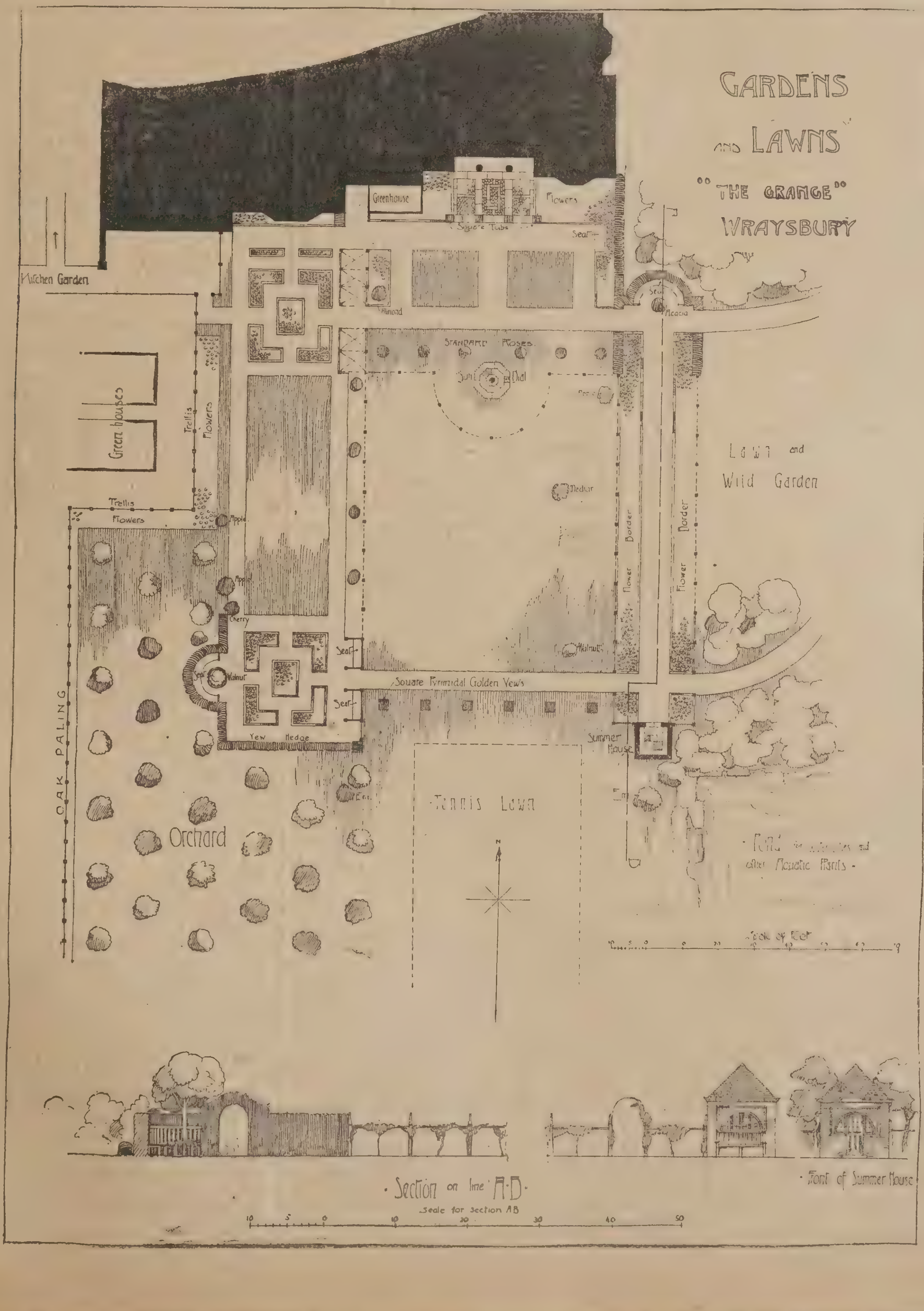
Avoid the usual pattern of broad-brimmed vases filled with lobelia, echeveria and calceolarias; green or oak tubs or big flower pots are far better, if filled with free-flowering green-leaved scarlet geraniums, hydrangeas, or *fuchsia gracilis*; but do not have too many even of these.

If a garden is very small I would advise the flower borders being long and continuous, as in this way you get a much better display of bloom, especially when the borders run outwards from the house. If a summer-house walk can be arched at intervals with honeysuckle, clematis or roses, and the end finished with a seat or other suitable object, with a yew or other snug background, I know of very few garden effects which can surpass the one which might thus be produced.

Small panel gardens such as you would wish to look upon from your entertaining-room window invariably produce the best effect when in beds are of the simplest design and at a lower level than the house. Such gardens as a rule should be perfectly level and have some kind of boundary fence round them; this may be simply a low box hedge, 2ft. high, or a low trellis; in some cases it might with advantage be designed as a sunk garden, with grass slopes and steps at the corners or at each side; if on the same level as the rest of the ground, the flatness might be broken up by having a sun-dial or lead figure in the centre. For breaking up the remainder you might plant golden or common Irish yews, golden hop-headed yews, standard Waterer's hollies, or even standard snowball trees.

According to the measure of exact symmetrical balance secured in the house (though I as a garden designer do not desire to see too many of those square box-like Early Georgian erections so difficult to garden for), so ought the disposition of the features on the terrace to be—grove to balance grove, and tree to balance tree—though not I hope carried to the extent of having a greenhouse on each side of the garden, necessitating two heating operations and two objectionable chimneys, as shown in a recently-published design; such attempts end in the ridiculous. If perfect balance you must have, and if you wish to emphasise this balance by some erection, choose a pair of garden houses, one for use as a tool-house and the other as a summer-house; but if balance is secured by the freer and more picturesque methods adopted by the majority of modern architects of coupling and grouping gables, chimneys, porticos, oriels and the like, balance ought to be secured in the gardens by similarly free measures. You would, whilst securing balance, obtain much greater variety.

One of the most awkward and expensive pieces of ground with which you will at any time have to deal is that in which the house does not follow the natural contour of the ground, but falls slantwise across the garden front, thus giving you a bank of earth on one side which is many feet below the floor level, and on the other side banks of earth standing high above it. I am afraid that in the small plot you have little chance of compromising, but on the larger site, I think, if you had the garden to lay out, you would at times be able to devise some means by which a happier result could be obtained. Where you have a subsoil which is easily removed, such as soft



sand, an alteration to the natural features may be more easily carried out than a modification of the plan of the house.

Although I have a great preference for walls when the ground slopes from the house, I prefer grass slopes when on the south side the ground falls towards the house. In this event an effective garden is very difficult of attainment, and unless very carefully managed you wil succeed in giving a very damp tank-like appearance to the place: the more your ground slopes away from the house the more will you feel the necessity for plantations; but the reverse holds good when the ground falls from north and south towards the house. Bright colours from flowers and occasionally primly-trimmed trees to mark distances if you like, but no general scheme of plantations. If the ground is treated formally you should start with a piece of level ground as wide as you can make it, and, instead of doing the entire break in level in one lift, divide into two or three levels as the case may require, allowing a sufficient width to permit a few flower beds on each.

I have earlier suggested a portion for the kitchen garden, but apart from actual convenience in working I really cannot see much objection to its being placed in any position, provided it can be treated as a part of the scheme. I maintain that some of the most charming gardens I have seen have been kitchen gardens. In Scotland more particularly you will oftener find a beautiful old kitchen garden, which sometimes excels the pleasure garden, and I would not even mind if the living-room window looked right down the central walk.

You will notice that I have hitherto said nothing about the effects which can be obtained by the arrangement of water. My reason for the omission is because there are so few gardens in which, owing to the cost of water supply, this luxury is available. I would point out, however, that a small wall fountain with its one falling spray judiciously placed at the end of a walk or a small circular basin with a central jet are often most charming; even where this is not possible it is often practicable to have a small pond in which to grow water lilies and water hawthorn.

The last detail to which I wish to refer is the planting of the flower borders, in connection with which I may add that I rely almost entirely upon perennials, and those of the hardiest varieties. To go in for what is popularly known as bedding-out is to adopt one of the most expensive kinds of gardening; there are, however, a number of annuals and biennials which are most useful for filling up blank spaces. Amongst these I need only refer to stocks, candy tuft, sweet allysum, mignonette, wallflowers, snapdragons, Canterbury bells, sweet rocket, forget-me-not and pentstemon. I would also allow bunches of scarlet geraniums, heliotrope and verbenas. Amongst the perennials, hollyhocks (single or double), phloxes, delphiniums, campanulas, lychnis, pinks, especially the common white, carnations, tufted pansies and Michaelmas daisies should be planted in groups, the greatest care being exercised to secure effective groupings and continuous show of flowers throughout the greater part of the year, excepting on the outer edge of a border, where a continuous line of one thing (such as pinks) may look very effective. Avoid planting in lines, but rather try to secure a little irregular colony of each plant. If you intend to successfully cope with this most important branch of garden making I would advise you to make the acquaintance of a nurseryman who has a good collection of hardy plants, and to visit his borders once a fortnight.

After all the advice I have given you I can imagine some of you will yet decide that the subject is too big or that the advice has come too late; if so, as one who loves a garden, let me suggest that when commissioned to design a house in connection with which there is to be a garden, you should seek to co-operate with the garden designer from the time you prepare your first 16th-scale plan, and to agree on some mode of treatment of those parts of the scheme where there is an overlapping of interests, and on the successful treatment of which depends in no small measure the success of the whole scheme.

THE SURVEYORS' INSTITUTION.

THE annual dinner of this institution was held last Monday week at the King's Hall of the Holborn Restaurant, W.C. Mr. John Shaw, the president, occupied the chair, and amongst those present were Mr. T. M. Rickman and Mr. Daniel Watney (past presidents), Sir J. F. L. Rolleston, M.P., and Mr. Arthur Vernon (vice-presidents), Sir John Wolfe-Barry, Sir Alexander Binnie, Mr. J. F. F. Horner, Mr. C. J. Owens, Mr. Andrew Murray (City surveyor), Mr. A. E. de Bock Porter, C.B., Mr. H. T. Steward, Mr. J. L. Wilkinson, Mr. D. J. Ross, Mr. G. M. Freeman, K.C., Mr. R. Ellett (president of the Incorporated Law Society), Mr. T. Blashill, Mr. J. W. Penfold (hon. secretary), and Mr. J. C. Rogers (secretary). Lord Brampton, Mr. Justice Grantham, Lord Alverstone, and Mr. W. Emerson (the president of the Royal Institute of British Architects) were unable to attend, and sent letters and telegrams of regret. The chairman proposed the "Houses of Parliament." Sir J. F. L. Rolleston, M.P., who responded, mentioned the fact that he was the only surveyor with a seat in the House of Commons. Sir Alexander Binnie (chief engineer of the London County Council), in giving the toast of the evening, "The Surveyors' Institution," observed that his profession was intimately connected with their own. He looked upon their institution with a great deal of pride and pleasure. It was a young institution, and it was rapidly growing, because its members had appreciated what was absolutely necessary for the growth of any profession in this country. They had established themselves in the first place, and then they were determined by their action that their profession should be kept up to the highest mark possible in an advancing age like the present. By the examinations which they had instituted they would establish, he felt confident, a profession of which all might feel proud. In reply, the President said he did not think the public generally were quite aware of the position occupied by the institution at the present time. Those who remembered the old days of the surveyors' profession could compare the present time most favourably with that period. When the institution was started many years ago—he believed that the first report was published in 1869—they had about 200 members. The last report showed that they had between 3,000 and 4,000 members, and he was happy to say that the numbers were still increasing. Mr. Rogers, their excellent secretary, had something like 400 awaiting examination at the present time, and if half those passed this year it would increase the number two or three hundred more. The accounts of the institution were also most satisfactory, and after paying off the debt in connection with the new building in Great George Street, which involved an outlay of £31,167, they had a considerable balance in hand. Their Forestry Museum had been re-arranged, while the library now contained something like 8,000 volumes, comprising works upon every subject of interest and use in the profession. The benevolent fund was established not quite two years ago by their esteemed past president, Mr. Robert Vigers. It had been very successful, and they were now in a position to commence operations. A sum of about £7,100 had been obtained in less than two years, and was invested. The council felt that the fund ought to be greatly augmented, and he appealed for further financial help. Finally, he complimented Mr. Penfold and Mr. Rogers on the good work they had done for the institution, and referred with regret to the death a few days ago of their clerk, Mr. Bennett, one of the most painstaking and conscientious men he had ever met.

Mr. Thomas H. Mawson, the well-known garden architect, has secured suitable office accommodation at 28 Conduit Street, Regent Street, W., for the convenience of clients who, whilst in town, wish to consult him. Work for clients in Ireland, North Wales, the northern counties of England, and Scotland will, as before, be conducted from the Windermere office. The London office hours are from 10 to 5, Saturdays, 10 to 1.

Correspondence.

Load on Girders.

To the Editor of THE BUILDERS' JOURNAL.

HARROGATE.

SIR,—I am much obliged for Professor Adams' reply to my letter on page 50 of your issue for February 20th, but am not quite clear about his theory. What is wanted is a girder to carry the weight over the clear span. There is certainly a load on the wallholds (if the girder is built in), but this is supported by the piers and rather increases the resistance of the girder to carry the load over the span. I understand by Professor Adams' theory that the girder requires to be made stronger as the wallhold is increased. If the girder in question had a wallhold of 4ft. it would be larger than if it had only 2ft. wallhold, all other conditions being the same; or if the girder rested on the walls (being fitted into recesses) with no weight on the wallholds it would be of smaller size than if the ends were securely fixed. With all due deference, I think this is wrong. As regards the natural corbel theory, I doubt whether the walls would stand if corbelled out as shown in the clear part of the sketch, and it would be better to err on the side of safety, as Professor Adams now suggests, but I am not yet clear as to the length of girder being the basis for calculating the load to be carried over the span. The piers should, of course, be able to sustain both this load and the weight of walls, floors and roof, not included in the load on the girder.—Yours truly, J. D.

To the Editor of THE BUILDERS' JOURNAL.

SIR.—In reply to the above letter, it is usual among engineers to take the effective span of a girder as the distance from centre to centre of the bearing surfaces. The actual span when fixed may be anywhere between the full length of the girder if it has considerable camber, and the clear span if the girder has no original camber and deflects with the load. One advantage of camber is that it throws the pressure well back from the face of the wall, but it practically increases the span. As to the corbel action of the walls in the second case, it is not supposed that the walls would stand if the whole shaded portion were removed, but the upper part remaining in place acts as a strut between the unshaded top ends. If a girder were built into a wall at its ends, further than sufficient to get the required bearing surface, it would of course alter the conditions and be an unfair straining of the question. The method already illustrated is not intended to be more than an approximate means of arriving at the weight to be carried, and if there is any doubt as to where to measure the load it is better to take advantage of the doubt on the side of safety and measure over all.—Yours truly, HENRY ADAMS.

The Art of Planning.

To the Editor of THE BUILDERS' JOURNAL.

BIRMINGHAM.

SIR,—The publication of several plans in recent issues of your journal causes me to make a few remarks on the subject of planning. This seems to be in a very parlous state, and if something is not soon done it bids fair to become a lost art. The whole aim of the present school of architects would seem to be "elevation"—and that alone. When one sees houses planned with doors so close to a fireplace that no one can sit near the fire; doors so placed that there is no space for a bed in the room without it is in a draught; it is time to protest. Surely it is not necessary to have bath-rooms and W.C.'s over the front doors so that soil and waste pipes with their discharges greet the coming guest. This is the present form of "welcome" in many houses. Kitchens which are only passages, with the light on the wrong side of the range, may also be cited. Do urge pupils to plan—plan and then plan.—Yours truly,

T. W. F. NEWTON.

Engineering Notes.

An Underground Railway at Berlin is to be constructed.

A Scheme of Underground Trams for London is under consideration.

Messrs. Coulson and Co., engineers, of Bishop Auckland, are extending their works and erecting new shops.

The Ellerbeck Hospital, Workington, is being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Runcorn and Widnes Transporter Bridge.—The Local Government Board have sanctioned the borrowing for thirty years of £10,000 for investment in the Runcorn and Widnes Transporter Bridge Company.

Regent Bridge Works, Aberdeen.—At Aberdeen harbour a new bridge is being erected to replace the existing Regent Bridge, which has become totally inadequate for the traffic. It is of the swing type with unequal arms; the long arm spans the new entrance 67ft. wide, while the short arm, loaded with kentledge, forms the counterbalance. The bridge has a total length of 155ft., with a width of 45ft., and has been designed to carry the heaviest railway, vehicular or traction-engine traffic; it will be constructed entirely of mild steel. The total estimated cost of the improvement works exceeds £100,000.

Maximum Charge for Electric Light.—The question whether the maximum charge for electric light, to be inserted in provisional orders before Parliament this Session, should be reduced to 6d. per unit was the subject of a conference held last week at the Board of Trade. Sir Courtney Boyle, having heard the arguments for and against the proposal, said the Board of Trade were very strongly of opinion that 8d. per unit—the present maximum—was too high. He thought a 7d. maximum would be adopted in a normal case. In very large populous places a 6d. maximum would be tried.

Crompton and Company, Limited.—With a share capital of £300,000 (made up of 100,000 shares of £3 each) this company now issues 46,000 shares of £3 each at the price of £3 5s. per share, which will rank in full for dividend as from April 1st next. The business was founded in 1878, and acquired by the company on its incorporation in 1888. It is one of the leading electrical firms dealing with lighting and traction. The subscription list was opened yesterday and will be closed to-morrow (Thursday). Applications should be sent to Messrs. Barclay and Company, Limited, 54 Lombard Street, E.C., or to any of their branches.

Voltage in Electric Lighting.—A Board of Trade enquiry was held last week at the Westminster Town Hall into the application of electric lighting companies and local authorities supplying electricity to have power to increase the pressure from 100 volts to a higher pressure, with the consent of the consumer, but failing that, as might be settled by the Board of Trade. At present no alteration can be made without the consent of the consumer, and it is to consider the abrogation of this provision that the enquiry was held. Mr. Balfour Browne, K.C., for the Westminster Company said that the proposed change would effect a saving to the company of £112,000 in twenty-one years, and this would enable them to supply consumers more cheaply.

"Tube" to the Isle of Wight.—It is proposed to construct a "tube" under the Solent. A Bill has been deposited for hearing at the present session. The total length of the proposed line is about six miles, of which the first four miles are on the mainland. The tunnel will start near Hurst Castle and run to a point near Totland Bay, where it will join the Freshwater and Yarmouth line. At this particular point the Solent is only 1½ miles broad, and it it is stated that no difficulties of engineering stand in the way of the work. The tunnel would be sufficiently large to take the ordinary rolling-stock of the London and South Western Railway, and no doubt through trains to Newport would be run from Waterloo. The journey by the present route takes about 4 hours to accomplish, and it has been calculated that by the tunnel route one could get from Waterloo to Newport in 2¾ hours.

Builders' Notes.

Mr. Mark Woolgar, master builder, of Southwick, died recently.

Messrs. Colledge and Bridgen, Midland Lock Works, Wolverhampton, have placed on the market a "New Century" patent casement stay, of which we give an illustration below. It has been well received and is a neat, durable and cheap fitting. Its price (in bronzed steel) varies from 3s. 9d. per dozen for 8in. stays to 6s. 8d. for 18in. stays: in brass the prices are respectively 15s. and £1 10s. 10d.: while another quality in extra strong brass costs 18s. 4d. and £1 15s. respectively.

"NEW CENTURY" PATENT CASEMENT STAY.

William Oliver, Sons and Howard, Limited.—The prospectus of this new company, which has been formed to acquire the business of Messrs. William Oliver and Sons, of 120 Bunhill Row, E.C., timber merchants, and the hardwood portion of the business of Messrs. W. W. Howard Brothers and Co., of 109 Fenchurch Street, E.C., states that the share capital will be £290,000, made up of 100,000 5½ per cent. cumulative preference shares of £1 each and 190,000 ordinary shares also of £1 each. There will also be issued £150,000 of 4½ per cent. first mortgage debenture stock (part of an authorised issue of £175,000—all ranking *pari passu*). The list was opened yesterday and will be closed today at 4 p.m., for town and country. Sir Richard Farrant is among the directors.

In the Fire Prevention Section of the Building Trades Exhibition space has already been allotted to the following firms:—Asbestos and Asbestic Co., Ltd.; D. Anderson and Sons; British Luxfer Prism Syndicate, Ltd.; Mr. Bugge; British Uralite Co., Ltd.; Broadbent and Co., Ltd.; Clark, Bunnett and Co., Ltd.; Crittall Manufacturing Company; Conduit and Insulation Co., Ltd.; Columbian Fireproofing Company; Green and Co.; Hobbs, Hart and Co.; Mr. F. Jones; Mural and Decorations Syndicate, Ltd.; New Expanded Metal Company; Non-Flammable Wood Company; Pilkington Bros.; Potter and Co., Ltd.; G. A. Williams and Sons. Firms that had not yet definitely applied should make application before the 15th inst. to the offices of the British Fire Prevention Committee, 1 Waterloo Place, Pall Mall.

The Bristol Clerks of Works' and Builders' Foremen's Association held its annual dinner recently. The chair was taken by Mr. Frank W. Wills (President of the Bristol Society of Architects), and he was supported by Councillor Lee, Mr. W. J. Steele (deputy City Engineer), Mr. H. Dare Bryan (Hon. Sec. Bristol Society of Architects), Mr. A. Krauss (President of the National Association of Master Builders of Great Britain), Mr. G. Humphreys (President of the Bristol Association of Master Builders), Mr. F. N. Cowlin, Mr. T. Lovell, Mr. Geo. Wilkins, Mr. A. J. Beaven, Mr. E. J. Neale, and Mr. A. Dowling, members of the Bristol Association of Master Builders. The management of the Clerks of Works' and Builders' Foremen's Association was represented by Mr. W. A. Woodland and Mr. W. F. Read (respectively President and Vice-President), and Mr. R. Hillier (Secretary). Mr. F. N. Cowlin submitted the toast of "The Architects," and Mr. H. Dare Bryan responded. Mr. W. Hollyman then proposed "The Master Builders." Mr. Krauss, in responding, urged the adoption of a scheme of their own for accidents, sick, and annuity provision, as well as life policies. In the north the assistance kindly and willingly rendered by the master builders, plus the contributions of the members, had already put this on a sound and satisfactory footing. The members could not serve two masters, the men's trade-union and the builders', and he remarked that they would be benefited by forming their association into a benefit society so that those members who now belong to the trades-union might be free from the men's union, and at the same time lose none of the benefits. Mr. G. Humphreys also responded. The chairman proposed "The Bristol Association of Clerks of Works' and Builders' Foremen," and congratulated his hearers on the progress the association had made. His opinion was that such associations did great good to the building trade. Architects and builders found the value of such an association in their midst where they could apply for men they required, and when he wanted a clerk of works he could rely upon the secretary sending him a suitable man. Mr. W. A. Woodland first responded, and said that association had existed for eight years. During the first few years progress was somewhat slow, as they were met with a certain amount of opposition, but lately they had made much more progress, and he thought they were in a fair way of successfully achieving the aims of the pioneers of the association. These aims all tended to one and the same goal, and that was the raising of the social status of clerks of works' and builders' foremen. Mr. W. F. Read also responded.

Law Cases.

A Dispute about Laths.—In the King's Bench Division of the High Court of Justice the case of *Vigers Brothers* v. *Sanderson Brothers* was recently heard. In delivering judgment Mr. Justice Bigham said that the action was brought to recover £1,307, the price of a quantity of sawn laths sold by the plaintiffs to the defendants, or, in the alternative, damages for non-acceptance of the same. Two contracts, dated respectively November 23rd, 1899, and December 16th, 1899, were made, the former specifying for laths of lengths varying from 2½ft. to 4½ft., and the latter for laths of lengths varying from 2ft. to 4½ft., but not more than 3 per cent. of 2ft. Under these contracts, and in pretended fulfilment of them, two parcels of laths were shipped by or on behalf of plaintiffs in the "Ella," a ship provided by the defendants. The shipment under the earlier contract contained 33 per cent. of laths 5ft. long (a length not mentioned in the specification); and the shipment under the later contract contained about 60 per cent. of laths 2ft. long, instead of not more than 3 per cent. The defendants rejected the goods and refused to accept the drafts. The question was whether the rejection was justifiable. On the one hand the plaintiffs said that the defendants were bound to take the goods subject to an allowance for any loss due to the failure to comply with the specifications. On the other hand the defendants said that the goods were not what they bought, and, therefore, that they were not bound to accept them. Evidence was given as to the value of laths 2ft. long, and as to the value of laths 5ft. long, and the judge found as a fact that neither length was worth the contract price; the former was practically worthless and the latter was very difficult to sell in large quantities, and required more labour in handling than the shorter lengths. In his opinion neither shipment could be regarded as in any sense a compliance with the contract, and he therefore gave judgment for the defendants.

Apprentices and Their Indentures.—At Plymouth recently Percy Sleeman and Ernest Palmer, apprentices, were summoned by Edwin J. Manning, builder, to fulfil the terms of their indentures. Complainant stated that defendants were apprenticed to him to learn the trade of a plasterer. Lately they had been very irregular in their attendance at work, and were frequently caught playing in working hours. On January 21st they refused to work because there was no labourer to attend them, and they had not returned to duty since. Cross-examined, complainant said mixing mortar was part of the trade of a plasterer. Apprentices sometimes had a labourer to attend them, but it was also customary for them at times to attend on themselves. Defendants alleged that for the last four months complainant, instead of teaching them plastering, had employed them on labourers' work. No plasterer worked with them to teach them. They had to work with other apprentices with no one to superintend or teach them. Edwin Williams, plasterer, testified that it was contrary to custom in the trade for plasterers or plasterers' apprentices to mix mortar or attend on themselves. It was the custom for the apprentice to work with a plasterer, and so learn the trade. The question at issue was whether the master had the right to habitually compel the apprentices to do labourers' work. The Bench were not satisfied that the complainant had ordered his apprentices to habitually do labourers' work, and made an order upon defendants to perform their duty under their indentures.

Delay in Submitting Plans for New Buildings.—At the North London Court last Wednesday Messrs. W. J. Bush and Co., Ltd., were summoned for failing to comply with a notice to set back the external fence of a new building which they have erected in Sheep Lane, Hackney, to a distance of 20ft. from the centre of the roadway. Mr. Childers, who conducted the case for the London County Council, explained that the London Building Act of 1894 and the Amending Act of 1898 required that where new buildings were erected on the site of old buildings a plan of the old buildings should be certified by the district surveyor before the new buildings were begun. Unless such plan were certified the buildings were to be treated as entirely new and no part of them or the external fence could be erected within 20ft. of the centre of the roadway. In the present instance the defendants were the owners of property on the east side of Sheep Lane, which was a very narrow thoroughfare. A number of old cottages on this land were pulled down, and on July 13th last the builder gave notice of the erection of a new factory and stables. On July 25th the surveyor to the Hackney Vestry called the attention of the London County Council to the fact that the buildings were in course of erection. On August 25th Mr. Hamilton, the defendants' architect, submitted to the district surveyor a plan of the old buildings and the district surveyor certified the line of the old fence. The case for the Council was that this plan was too late, and being late the building came within section 13, sub-section 1, of the Building Act. Section 200, sub-section 2, fixed the penalty at not less than 40s. or more than £5. Mr. Macmorran, K.C., said that it was a purely technical offence; the plan was late and the defendants admitted it, but the point for the magistrate to consider was whether it was absolutely necessary for the certified plan to be sent in before the building was begun. Mr. Fordham said that he should find that the plan which had been certified by the district surveyor was sufficient to comply with the Act, but it was not submitted in time. He should hold that the Act contemplated the production of the plan before any new building was begun. He must therefore convict. He fined the defendants £3 3s. with £2 2s. costs, but he would, if asked to do so, state a case for the opinion of the superior Court.

Disregarding the Building By-Laws.—In the Chancery Division on February 28th Mr. Justice Cozens-Hardy resumed the hearing of the action brought by the Corporation of Harrogate against Mr. William Holmes, to obtain an injunction restraining the defendant from erecting or permitting to remain erected buildings in Valley Drive and Valley Mount, Harrogate, contrary to the Corporation Act of 1893 and the by-laws. Mr. Frank Bagshaw, the borough surveyor, having given evidence, Mr. Eve, the defendant's counsel, admitted that the defendant had not obtained the approval of the Corporation to the plans, and that the height of the buildings was in excess of the height permitted, but he contended that the ventilation was thorough, and that the defendant had complied with the spirit of the by-law. Mr. Justice Cozens-Hardy said he did not suppose that the Harrogate Corporation desired to do anything but their duty, but the defendant was "in mercy," and he must make some terms with them. Council thereupon consulted their clients, and Mr. Micklem subsequently informed his lordship that the parties had agreed to an order. The defendant was prepared to remove the upper part of his building, to strengthen all the walls as might be required by the Corporation, and to submit forthwith plans to be approved; and Mr. Eve stated that on defendant giving that undertaking there would be no order in the action except that defendant should pay the costs. Mr. Justice Cozens-Hardy approved the arrangement, observing that it was important builders should understand that they could not go on without approval of the plans.

Giving of Receipts by Public Bodies.—At the Town Hall, Chertsey, James Kingston, of Addlestone, was recently summoned by the Chertsey Urban Council for £220 1s. 7d. in respect of work performed under the Private Streets Works Act, 1892. Mr. T. E. H. Chaldecott (clerk to the Council) said that certain work had been done at Common Lane, near Woodham, by the Council after the usual notices had been served. The charge was 6s. 4d. per foot frontage in respect of a certain house and garden situated in that lane, and for 405ft. of land in the same road. Interest at the rate of 4 per cent. was also charged from the date when the work was executed. Mr. Kingston had given the Council a small strip of frontage in the lane, and an allowance was to be made for it in the final apportionment. That had somewhat complicated the figures, owing to which the surveyor made a mistake, and instead of charging him £255 4s. 8d. for the house and garden frontage, he only charged him £170 4s. 8d., thus leaving £85 balance due to the Council. Mr. Kingston saw that, and said "You have given me a receipt, but you have not made it in full. Will you please do so?" Unfortunately the surveyor acceded to the request, and therefore the Council claimed that, as he had made an error, the remainder of the money was the Council's in spite of the receipt which had been given. Then in regard to the meadow land, for which Mr. Kingston was charged £128, he said that it was not his, and that he had sold it to a Mr. Gwyer. But he (Mr. Chaldecott) contended that, no matter what contract had been entered into by Mr. Kingston in regard to the disposal of the land, he was still the owner at the time, and if he had an equal claim against Mr. Gwyer he would have to settle it in another Court. As to the difficulty about the receipt the Bench should remember that it was not a case of a man giving a receipt for money due to himself, but of an official giving one for a public body. He therefore submitted that a genuine error of that description should not bar that public body from recovering what was due to them. The magistrates retired to consider their verdict, and on returning into court the chairman said they thought the Council had failed on both issues, namely, the £85 and £128.

Quantities: A Curious Libel Action.—In the case of *Sadgrove* v. *Hole*, heard last Friday in the Court of Appeal, the defendant asked for judgment or a new trial in an action for libel tried before Mr. Justice Ridley and a common jury, when judgment was entered for the plaintiff with £5 damages. The costs had since been taxed and were returned at £140. Mr. Firminger, in support of the application, said the defendant desired to throw two shops into one, and he employed an architect named Webb. The contract was submitted to several builders, and it came to his knowledge that the quantities submitted to two of them were in excess of the amount which he thought was permissible to be paid. He therefore, solely to save the builders wasting their time, sent a hurried postcard to each saying the quantities submitted were incorrect, and asking them to come round to him and see the plans before making their tenders. The Master of the Rolls, in giving judgment, said the alleged libel was contained on a postcard from a building owner to a builder, and the point raised was unique. So far as material the libel was this: "Quantities sent to you this morning by architect are entirely wrong." The question was whether that constituted a libel on the clerk of the architect, who was not named, but who came forward as the plaintiff in this action and said that this statement was a libel on him as being the "quantities clerk" of the architect referred to in the document and answerable for the correctness of the estimates. He could not say that the words were incapable of being a libel, but in his opinion they were written on a privileged occasion. The circumstances being privileged there remained but the one question, Was the privilege destroyed by evidence of express malice? In his opinion there was none. For these reasons the court ought not to put the parties to the expense of a new trial. Judgment would be entered for the defendant, with costs here and below. The other Lords Justices concurred.

Workmen's Compensation: Height of Buildings.—A somewhat unusual case was heard recently at the City of London Court. Under the Workmen's Compensation Act, *William Joseph Lawrence* sued *Mr. J. Spencer* for damages for personal injuries. The plaintiff was employed in pulling down some large premises at the corner of Paternoster Row and Newgate Street. While knocking down a wall, he fell to the ground and was badly injured. His wages had been 26s. a week, and he now claimed half that sum under the Act. The only question in dispute was the height of the building at the time that the accident occurred. The defendant's case was that as the building was not 30ft. high when the plaintiff fell it was impossible for him to recover anything in the proceedings. The plaintiff, on the other hand, said that the building was 60ft. high at the outset and that it was over 30ft. high when he was engaged upon it. It was shown that the building was over 30ft. high when the plaintiff was working upon it, and the learned Commissioner found that the plaintiff was entitled to recover the amount claimed of 13s. per week, and the costs of the proceedings.

Surveying and Sanitary Notes.

Drainage Construction.—At a meeting of the Society of Engineers last week a paper entitled "Notes on certain details of Drainage Construction," was read by Mr. Gerard J. G. Jensen. The author, at the outset, pointed out the desirability of giving attention to the merest details in drainage construction. Amongst certain matters which up to the present have been misunderstood or neglected, none, he thought, claimed greater attention than the construction and arrangement of ventilation pipes. The practice of constructing ventilation pipes of iron was reprehensible, as they were invariably found to rust in the interior, thereby not only deteriorating and making renewal necessary, but also becoming blocked and thereby rendering insanitary that which might otherwise be a good system of drainage. Amongst other details of construction pertaining to ventilation pipes, knowledge regarding the action of drain air upon the human constitution was still inexact. Pending a more complete knowledge on the subject he urged the necessity of erring upon the safe side in choosing positions for liberating drain air through ventilation pipes. With regard to the still frequent practice of providing waste-pipes with hopper heads at the points at which branches from fittings within the house join the main pipe, he could imagine no more insanitary and offence-giving construction, and thought that the fullest measure of the evils of the system was perhaps experienced under the, at present, fashionable flat life. Some observations on manholes and drain joints followed, the paper concluding with some remarks on overflow-pipes from lavatory basins, baths and sinks. The author considered that too little attention is, as a rule, bestowed upon these details, and suggests that the musty smells in bath rooms and similar apartments might frequently be ascribed to faulty overflows. The continued manufacture and use of uncleanly overflow-pipes, he thought, must be one of the wonders of house drainage, since their evils must be patent to all.

ARCHITECTURAL ASSOCIATION.

DAY COURSES OF INSTRUCTION.

A SPECIAL General Meeting of the Architectural Association was held last Friday evening to consider the Committee's scheme for the establishment of day courses of instruction in connection with the Association. Mr. W. Howard Seth-Smith, the president, was in the chair.

Early in the present session a strong Education Committee was appointed to consider and report upon the whole subject. This committee consisted of Messrs. Cole A. Adams, F. T. Baggalay, R. S. Balfour, G. B. Carvill, Arthur Cates, B. F. Fletcher, H. L. Florence, F. T. W. Goldsmith, H. T. Hare, F. G. F. Hooper, P. J. Marvin, E. W. Mountford, Beresford Pite, W. A. Pite, H. W. Pratt, G. H. Fellowes Prynne, E. Howley Sim, H. D. Searles-Wood, W. Howard Seth-Smith, John Slater, Leonard Stokes and Aston Webb, A.R.A. After six meetings their report was presented. The General Committee practically adopted the whole report with few amendments. The proposals are as follows:—

1. That the studio be opened during the day, and that day classes be established forthwith. The work in these classes and in the studio to be of a preparatory and supplementary nature suitable for those who have entered or are about to enter architects' offices as pupils.

2. That this branch of the work of the Architectural Association be known as the day school, while the present classes be called the evening school.

3. That the first course of studies be arranged to cover one year, but students to be afforded the opportunity of taking a second year in the studio, when they might also attend some of the evening classes.

4. That each year be divided into three terms, namely: autumn, spring, and summer, consisting as nearly as may be of 13 weeks each.

5. That the work in the studio be supplemented by a certain number of lectures on History and Construction, so that the students may better understand their work.

6. That a master of the studio be appointed at a salary to be fixed by the committee, who shall deliver lectures on the History of Architecture and Elementary Building Construction. The master to nominate an assistant to help him in the studio, such assistant, if approved, to be remunerated as may be deemed expedient by the committee.

7. That the studio be open from 9 30 A.M. to 5 P.M. (1 P.M. on Saturdays), and that the assistant master be in attendance during these hours. The master himself, however, would attend at stated times to instruct the students and deliver his lectures.

8. That the fee for the full course be 12 guineas per term or 35 guineas per annum, but students taking only the lectures to pay a fee of 2 guineas per term for each course, or 5 guineas per annum. Students wishing to join the day school must submit a letter of recommendation.

9. That after payment of the fees for the first year's course students shall be eligible for election as ordinary members of the association without paying the usual entrance fee.

10. That students should be encouraged to cultivate a thorough knowledge of the French and German languages (if they have not already acquired same), as these languages are particularly useful for purposes of study and when travelling abroad.

11. That the studio library be augmented as may be found necessary, and be available at all times when the schools are open.

12. That the management of the school be under the direction of the committee of the Architectural Association, assisted by an advisory board of eminent architects and other gentlemen.

13. That the following subjects be included in the curriculum:—*First Year's Course:* (*a*) The use of instruments and scales, (*b*) freehand drawing, (*c*) the five orders of Classic architecture, (*d*) the elements of the various styles of architecture, (*e*) the principles of mechanics, (*f*) elementary construction, (*g*) sketching and measuring details and portions of existing buildings, (*h*) thirty-six lectures on the history of architecture (illustrated by visits to buildings and museums), (*i*) thirty-six lectures on elementary construction and materials (illustrated by visits to workshops and buildings in progress). Each student will be expected to take up a course of reading under the direction of the studio master. *Second Year's Course:* (*a*) Continuation when necessary of the subjects forming the first year's course, (*b*) perspective and sciography, (*c*) descriptive and applied geometry and graphic statics, (*d*) principles of architectural design. Each student will be expected to take up a course of reading under the direction of the studio master.

N.B.—Students taking a second year in the studio should attend such lectures or classes, day or evening, as the master may advise. The master of the studio will direct students as to their vacation studies.

Mr. ASTON WEBB, A.R.A., in proposing the adoption of the scheme, said: A young man coming into the profession at present could either become an articled pupil or enter an office in some capacity and work into a position. A pupil when he entered an office was set to work, probably at drawing the orders and studying the elementary problems of construction, and made up these pursuits with a certain amount of practical office work and tracing. The idea suggested itself to the committee that this drawing and tracing, the elementary problems of construction, stresses and strains, and materials could be better taught in a school than in an office. If pupils went there for a year they would go into an office better qualified to learn than if they went there altogether ignorant. He himself had had one uncertainty about the scheme: that a young man who had gone through the course for one or two years might think he was a perfectly fledged architect and go into an office as a head assistant. If that were likely to occur it would be a great misfortune. He had written to Professor Simpson, the professor of architecture at the Liverpool University, upon this question, and he had replied that in his opinion there was not the slightest danger to be apprehended. Professor Simpson held that the system was better than that of France or Germany, as it let pupils into an office afterwards. As to whether the Architectural Association was the best body to carry on the classes, he thought most of them would rather like to see the training of architects to some extent in the control of architects themselves, who must know better the requirements of students than instructors who were not architects at all. With regard to the risk that the Association ran, the Committee had had the business foresight to see that the members were free from any loss which might occur; the promises which had been made would absolutely free the Association. If principals would advise parents to send their sons to be grounded at the Association before going into offices, the classes would be a success. If these classes turned out a financial success it would enable the Association to expand itself very considerably and aid them to secure more accommodation.

Mr. JOHN SLATER seconded the motion, and Messrs. Leonard Stokes, A. S. Taylor, Arthur Stratton, Arnold Mitchell, F. G. F. Hooper and H. P. G. Maule also spoke in favour of the scheme.

Mr. W. H. SETH-SMITH in putting the motion read a letter from Mr. Beresford Pite, who was unable to be present, objecting to the inclusion of his name in the proposals of the committee as if agreeing with their recommendations. Mr. Pite stated he was clearly of the opinion that the proposal was unwise in the true interests of the Association and entirely dissociated himself from the recommendation. In regard to the scheme for new premises Mr. Seth-Smith said they had almost £1,500 promised and were only waiting to find a convenient site to bring the scheme to fruition.

The scheme for day classes was then adopted unanimously. The following alterations of the bye-laws were then agreed to:—

Add to bye-law No. 14: "*Each student who has paid the fee for a Course of Day Classes of Instruction for one year shall be eligible for election as an Ordinary Member without payment of an entrance fee.*"

Add to by-law No. 15, after the words "each Ordinary Member": "(*with the exception stated in by-law No.* 14)."

Add to by-law No. 27 at end: "*or one of the Hon. Secretaries.*"

Add to by-law No. 30 before the word "Auditors" "*Honorary.*" (This was made necessary by the decision to employ a regular auditor for the accounts.)

Add to by-law No. 36 the word "*Honorary*" before "Auditors" in every case.

By-law No. 43 to read as follows:

"*A Special General Meeting shall be called by the Honorary Secretaries when required by the Committee, or at any time, not less than two weeks nor more than eight weeks after the receipt of a requisition, stating the purpose for which the meeting is required, and signed by at least twelve Ordinary Members. The presence of twenty-five Ordinary Members shall be necessary to constitute a quorum at any meeting called under this by-law, and in each case the agenda of business to be considered shall be duly posted up in the premises of the Association, advertised, sent by post or otherwise, as may be determined by the Committee, at least one clear week prior to the meeting and specifying the place, day and hour, and no other business shall be taken at such meeting.*"

Omit by-law No. 44. (The two by-laws Nos. 43 and 44 originally clashed).

Add the following new by-law: "*No member of the Committee shall be appointed to a paid office or lectureship in connection with the Architectural Association.*"

New Patents.

These patents are open to opposition until April 13th.

1900. — **White Lead.**—2,774, G. BISCHOF, Hythe Road, Willesden Junction, London, N.W. This invention relates to a process for converting white lead into a marketable oil paste or "ground" white lead without previous drying, which is an operation dangerous to the health of the operatives. The process consists of the following stages:—Filter pressing and washing, pugging about a third of the white lead with about two-thirds of the oil, running off separated water, pugging in the remainder of the white lead and oil, and drying by a current of hot air while the material is being pugged.

Imitation Stained Glass.—7,491, J. LEROY, 11 Rue Chateau Landon, Paris. A design is printed on paper which is afterwards varnished. Usually it only then remains to apply a coat of varnish to the reverse side of the paper, but according to this invention the varnish (whilst wet) is covered with finely powdered glass. By this means it is claimed that a complete imitation of the real article is obtainable.

Gas-heating Stoves.—10,255, T. F. EDGEWORTH, 127 Cheltenham Road, Bristol. In order to gain a maximum of heat a Bunsen flame is enclosed in a tube of metal or fireproof material of such diameter and length that its inner wall is in contact with or close to the flame. The tube is fitted with a baffle-plate at the top.

Brick Kilns.—16,422, W. SAYER, The Mount, Rowditch, Derbyshire. Bricks not thoroughly dry are set in that part of the kiln which is just commencing to heat, so that the waste gases from the burning bricks, passing on their way to the damper chamber or drying tunnel, will part with some heat and take up moisture. Thus the atmosphere of the drying chamber can be regulated by the vapour given off by the bricks last set in the kiln.

Burglar Alarms for Windows and Doors.—20,795, J. G. MOSER, 2,711 Armand Street, St. Louis, Missouri, U.S.A. According to this invention, should the door or window be opened by a house-breaker, a trigger is operated and fires a cartridge!

Spring Roller Blinds.—21,192, T. W. TIDMARSH and F. C. TIDMARSH, both of 226 Upper Street Islington, London, N. This invention applies the band brake to blinds. Springs are arranged to act on the brass end cap, being operated by a cord.

The following specifications were published on Saturday last, and are open to opposition until April 20th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1899.—22,731, LEIGH (*Mollenhauer and Mayer*), locks and latches.

1900.—2,644, ADAMS, controlled flap-valve or sluice. 2,739, GREEN construction of fireproof floors and roofs. 2,759, YOULTEN, stoves for heating purposes. 3,094, SPENCER, kilns for burning limestone. 4,460, SKINNER, fire and burglar alarm. 5,670, TAILBY, circular saw benches. 6,142, BURGESS AND BURGESS, saw-guards. 6,242 and 6,324, ETCHELLS, locking and releasing gear for hoist gates or doors. 7,024, GASKELL, chimney cowls. 7,119, SYMINGTON, chimney tops. 7,356, SCHATTNER AND HARMER, electrical incandescent lamps. 7,459, MOORE, water-closets. 11,547, HILL, fittings for overhead trolley systems of electric tramways. 17,233, BRIERLEY, adjustable scaffolding bracket. 18,316, MILLER, instrument for trisecting any angle. 19,964, RIXSON, door check and spring. 20,035, ROSIER, hydrocarbon burners for heating and lighting. 20,288, GRAPENGETER, steam pile-drivers. 20,355, CURLEY, scaffolds. 22,375, O'BRIEN (*Galiazzo and Cristilli*), portable scaffolding ladders. 23,040, KRAUSE AND BEDDIES, process for the impregnation of wood and fibrous substances. 23,045, JACQUOT, JACQUOT AND TAVERDON, portable planing apparatus. 23,682, BROWN, prism plates for windows. 23,837, BÜHL, saw-setting machines.

1901.—665, VIVINUS, universal joints. 927, AXER, barrels for transporting cement. 1,058, SHELDRAKE, incandescent gas burners.

THE HOUSING PROBLEM.

L.C.C. CRITICISED.

AT the annual meeting of the Artizans', Labourers' and General Dwellings Company, Ltd., held last Wednesday at Westminster, Mr. Ernest Noel (the chairman) said that the gross revenue for the past year amounted to £181,000, and the nett revenue to £115,000, which enabled the Board to pay the usual 5 per cent. dividend. The housing question had now become most prominent, and a great many promises were continually being made which, he believed, it was utterly impossible to fulfil. The London County Council had pledged themselves to a great building scheme at Tottenham, and he thought that they had chosen a good situation for their experiment. It was well supplied with workmen's trains and the price given for the land did not seem excessive; but would the Council's object be attained? He understood that that body hoped to provide homes so cheaply that men with wages of from £1 to 30s. per week would be able to take them. He could only most heartily wish the Council success; but he felt certain that the Council could not build so as to enable them to fix the rents as low as the ordinary builders of cottage property were daily providing. He could not but think that the Council's building schemes would have an injurious effect on the more efficient housing of the poorer members of the community. Did the Council intend to build for the whole working population of London which was still indifferently housed? If not, their action must be mischievous. At the present time large numbers of persons were engaged in building such houses; and if the rates were to be used to make up the loss sustained by the Council in letting houses below their value, or below what would return the interest on the borrowed money, so as to give cheap homes, two things would arise. First, the whole of the working men living in ordinary houses would be taxed to give a small and favoured number cheap houses; and secondly, those now building would withdraw from a competition which would be manifestly unfair, and then fewer houses would be built. After all, it was these small builders who had done most to provide houses for the working classes. Their own company was the largest of the associations engaged in the work of providing pleasant and sanitary homes for the people; and yet in their 5,700 separate houses and 1,467 separate tenements in block buildings they provided for rather less than 50,000 people, so that the combined efforts of all the associations engaged in building workmen's houses did not compare with the number of houses provided by the comparatively small private builders. These the County Council would seriously hinder; and he ventured to assert, without fear of contradiction, that anything which checked or put hindrances in the way of those who were by free trade supplying this great want would render the housing question far more difficult of solution. Sir Richard Farrant (deputy chairman) expressed the opinion that although the jerry-builder, his methods and materials, needed to be supervised, he was, after all, the man who made the main provision for the working classes of London. Although it had been the fashion to deride him, he should like to say that, under proper control and with proper regulations, the jerry-builder was absolutely necessary to provide cheap dwellings for the working classes. This company found, at Streatham especially, that their high-class buildings were not appreciated. The tenant did not care anything about the solidity of his building and was not willing to pay 1s. a year more to have his house built with better bricks or better tiles. The poor man wanted the biggest rooms he could get at the lowest rent. He was not satisfied that, however energetic the County Council might be, and however cheaply they might get their money, they would be able to compete as regarded price with the ordinary conditions of building as carried out by the small builder working with his own capital. The Government had recognised to some extent their responsibility, and had sold to the County Council nine acres of land at Millbank for £2,500 an acre, whereas for commercial purposes it was worth at least £10,000 an acre. In evidence given by him some years ago before a committee of the House of Commons on the housing of the poor he laid it down that it was the duty of the great landowner to provide on his estate for all classes of the community. The late Duke of Westminster recognised that duty, and all over his estate he provided this and similar companies with sites for block buildings at a sixth, and in some cases a twelfth, of their market value. The late Marquis of Northampton did the same on his Clerkenwell estate. The agent of the present marquis now offered at 6d. per foot what was formerly offered at 2d., and the result was that land taken at the higher figure necessitated the rent being 1s. per room per week more than if obtained at the lower price. Lord Portman had also provided this company with land at 2d. per foot. The great landowners were not, however, offering any more land for the erection of workmen's dwellings, and he was afraid that this was due to the County Council assuming the responsibility which others ought to bear.

Masters and Men.

A Strike of Painters at Chester has occurred in regard to the allowance for lodging money to men working away from town. The men demand 4s. a week country allowance, the foreman to be allowed 6s. per week; in cases where a man is sent into the country for a portion of the week they shall be entitled to receive 1s. per day country allowance. If employed on country jobs over three miles and up to 20 miles they demand their third-class railway fare in and out every week; up to 30 miles once a fortnight; and up to 50 miles once a month; over 50 miles to remain at the job till it is completed. All the time spent on the journeys they want paying for at the ordinary rate of wages, and all journeys back to Chester made in the time of the man except the last journey back to Chester.

Bricks and Morta

APHORISM FOR THE WEEK.

Whatever in architectural work is endo
with the expression of death is bad art.
G. F. BODLEY

Our Plates. PRINCE ARTHUR'S CHAP
is situated on the south s
of the choir of Worcester Cathedral. It v
built in the year 1502 by King Henry VIII.
memory of his brother Prince Arthur, whose to
is inside the chapel. The south side is some f
higher than the north owing to a difference in
floor levels of the choir and the south transe
It is built of Caen stone. The chapel had be
covered up with plaster (possibly to prevent
destruction in Puritan times), but was clean
and restored under the superintendence of
Gilbert Scott and completed in 1874. C
illustrations are by Mr. A. J. Pitcher, and w
awarded a bronze medal in the National Co
petition two years ago.—The houses on Riv
side Drive, New York, by Ernest Flagg a
Alexander M. Welch, are typical specimens
the modern American school of architectu
Special attention should be paid to the detail

The Blackfriars' Archway. THE archway of the
Blackfriars' Priory, which w
discovered last April, h
been removed by Mr. Wickham Noakes (a p
master of the Merchant Taylor's Company)
his residence at Selsdon Park, Croydon, whe
it has been erected in the grounds of the pa
Mr. Gordon Hill expressed the opinion that t
remains were in no way associated with t
Black Friars, but ante-dated the friars' buil
ings by a hundred years, and were, perha
relics of a palace. On the other hand, anoth
eminent authority, Mr. St. John Hope, co
cluded that they were late thirteenth- or ea
fourteenth-century work. The Blackfria
Priory was commenced about 1276, and, if M
Hope's opinion carries any weight with it, t
probability is that the remains are none oth
than those of some vaulted building of t
priory.

Logic in Building Design. A LECTURE was delivere
last week before the Lee
and Yorkshire Architectur
Society by Mr. Geoffrey Lucas on "Logic
Building and its influence on Design." Mr.
Carby Hall presided. The lecturer declare
that the bulk of modern building did n
express the deep underlying tendencies
present-day humanity in the same sense th
architecture had incorporated such ideas, sy
pathy and feelings in the past. Present ai
seemed small and commonplace. Of cour
good buildings were produced nowadays, b
the great architectural achievements of th
lately-closed century were almost entirely of
scholarly and archæological order. Architectu
was surely one of the great arts. It was, to
a science, and a progressive one. It demande
a thorough union of construction and ador
ment. Picturesqueness was a side issu
Buildings had been ostentatiously erected wit
a vast variety of window and adornmen
That, however, was illogical. What they woul
like to say of a building was that it was a si
ple and honest endeavour to meet the requir
ments involved. Replicas were too commo
Truro Cathedral and the Houses of Parliame
were not without their grandeur, but the
hardly appeared to be in touch with the ag
New Scotland Yard, on the other hand, was
vigorous and simple piece of modern work, we
suited to the purposes in view. One of th
finest examples of modern logical building wa
the new Roman Catholic Church of West
minster, which they might regard as markin
the keynote of further progress. The comple
conditions under which architects had now t
work, the lecturer feared, told against advanc
The withdrawal of the architect from persona
contact with his work also handicapped him i
comparison with his fellow-artificers of old
All details had now to be settled beforehand
and the competition system was another forc
acting adversely upon architecture as a pro
gressive science. On the other hand, ther
were not a few advantages pertaining to th

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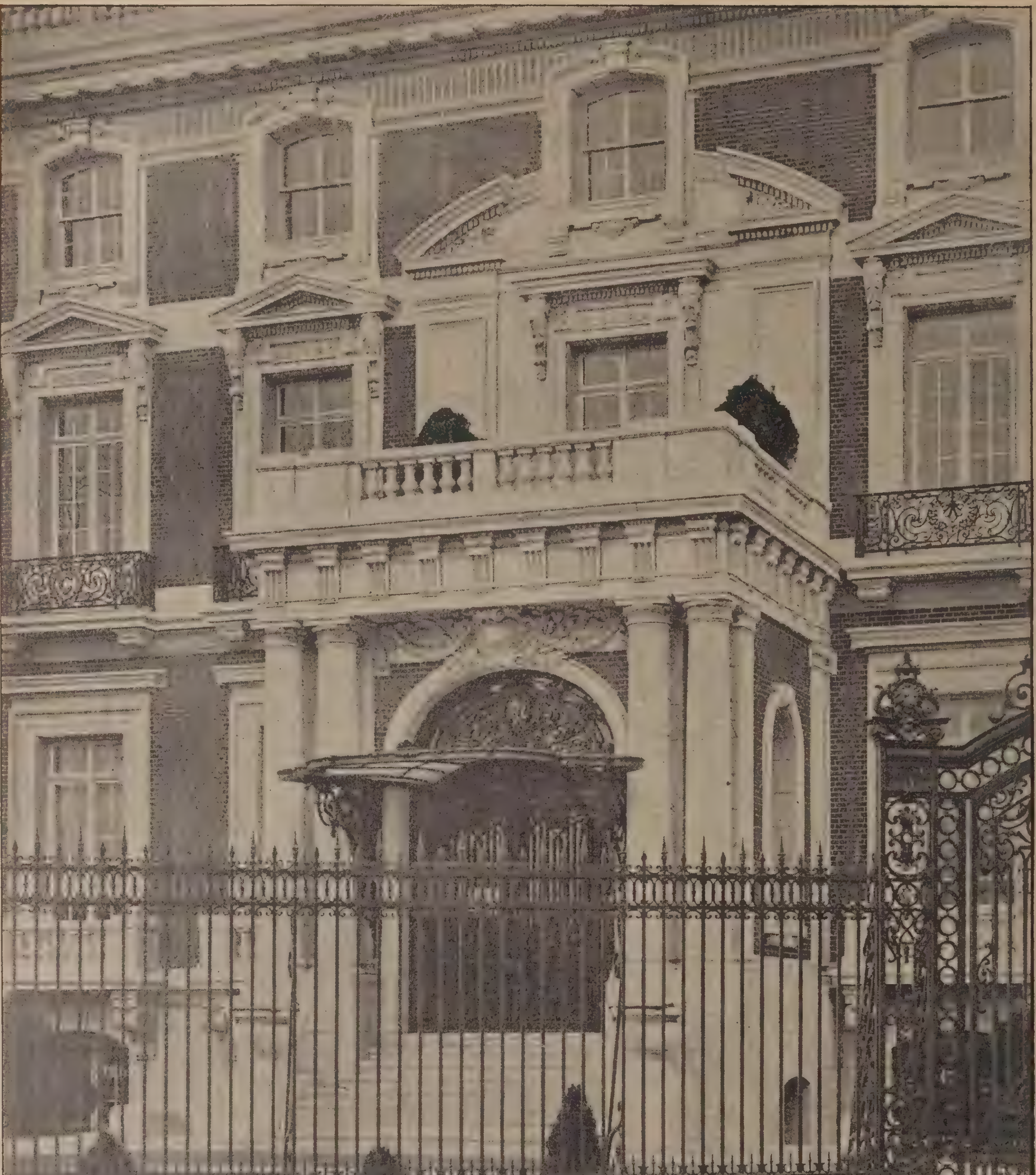
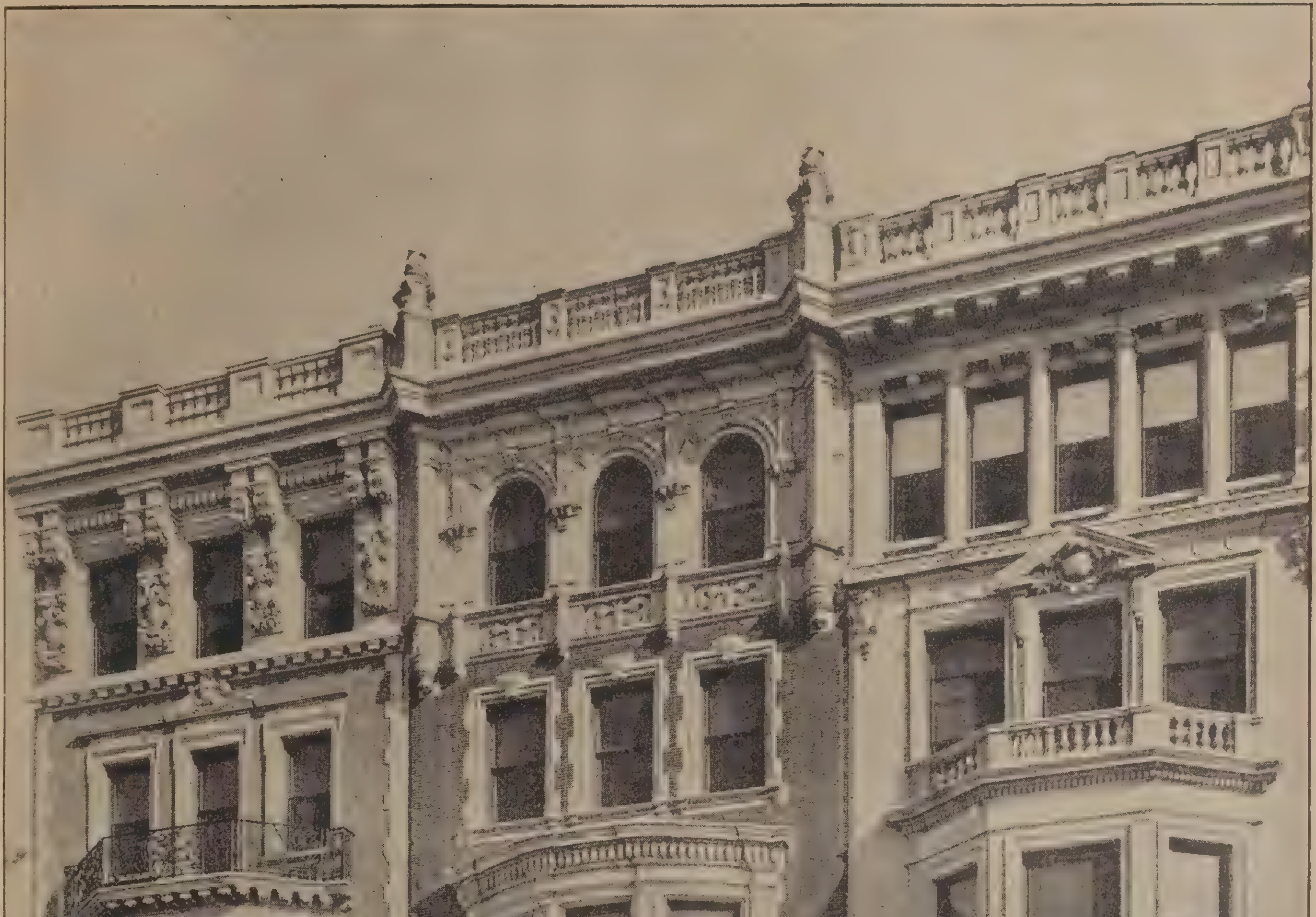
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, March 13th, 1901.



ENTRANCE PORCH, HOUSE FOR THE CLARK ESTATE, RIVERSIDE DRIVE, NEW YORK.
ERNEST FLAGG, Architect.



HOUSES ON RIVERSIDE DRIVE, NEW YORK.
ALEXANDER M. WELCH, Architect.

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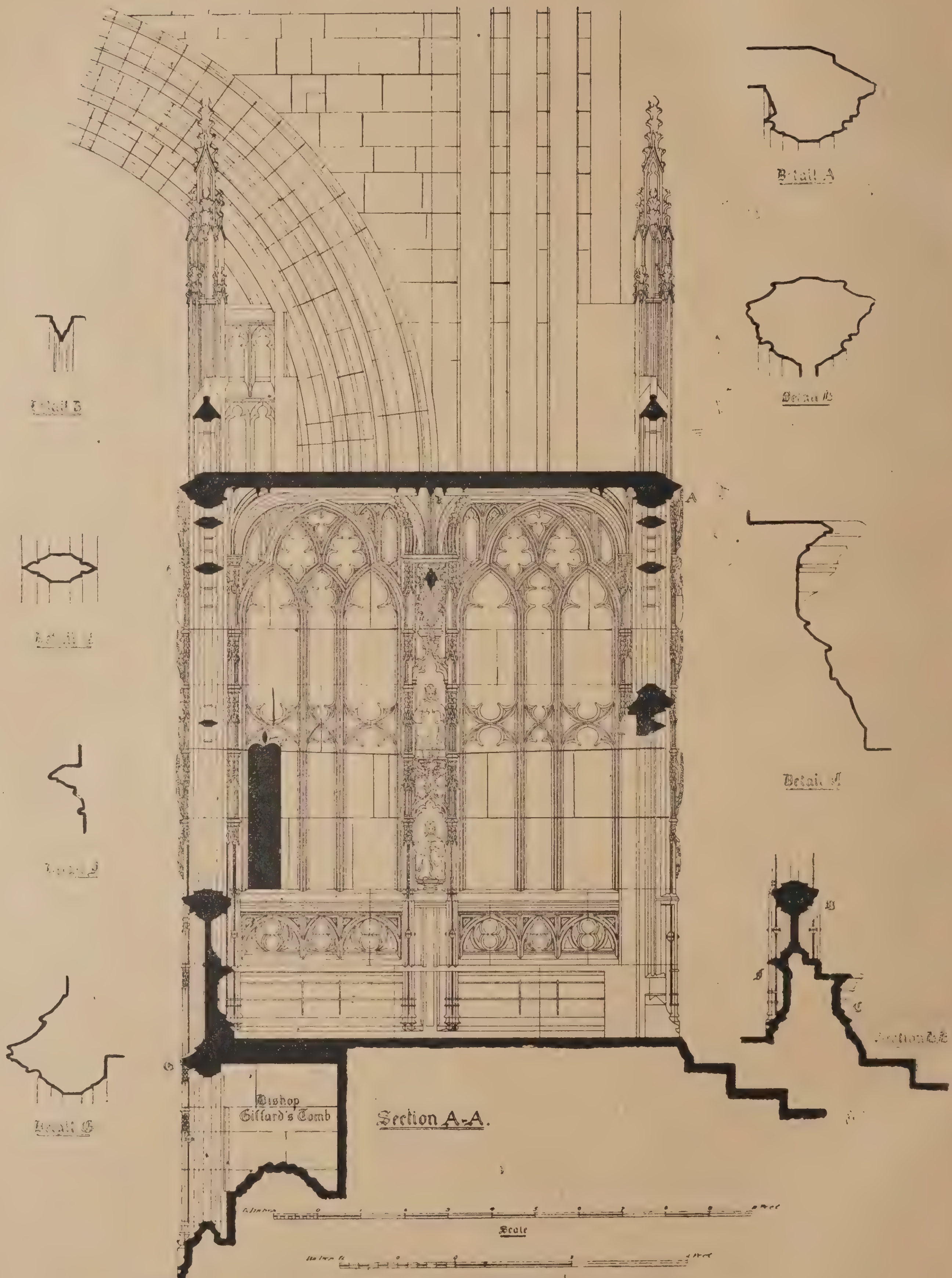

PRINCE ARTHUR'S CHAPEL, WORCESTER CATHEDRAL. Measured and Drawn by A. J. PITCHER.

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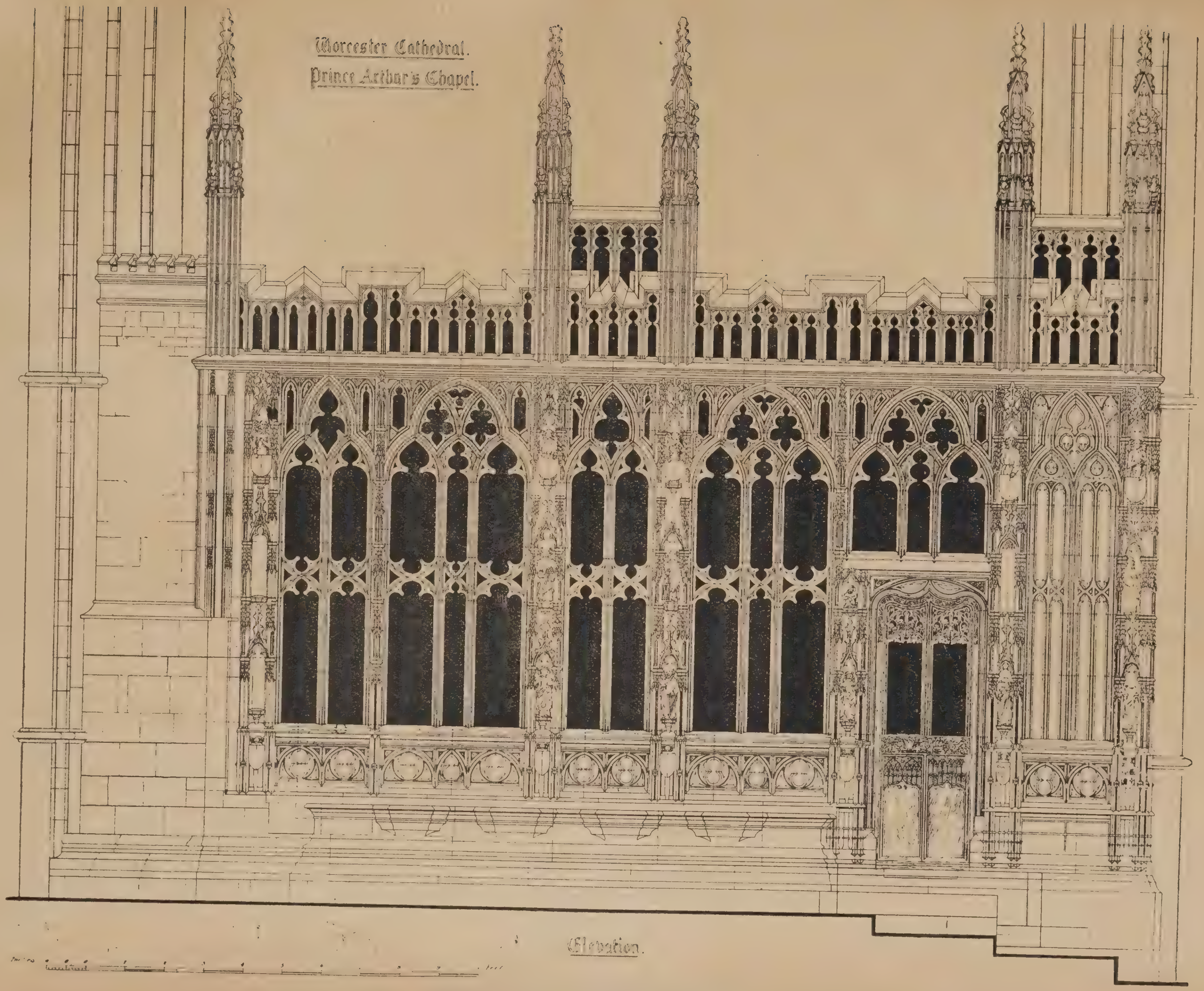
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, March 13th, 1901.



Worcester Cathedral.
Prince Arthur's Chapel.

Elevation.

Measured and Drawn by ALBERT J. PITCHER.

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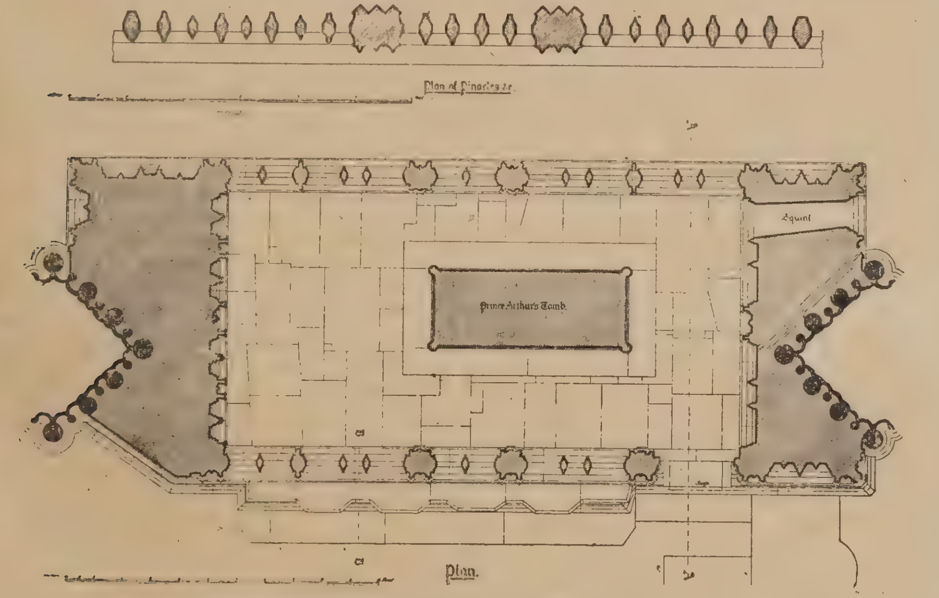
architects of the present time. They had the aid of photography, and possessed materials that the ancients could not command. Labour, again, was as plentiful as formerly. If they would advance, it must be on logical lines, purifying architecture of its "Billingsgate," and aiming solely at that which appeared true and essential.

Church Crafts League. AT a recent meeting of the Church Crafts League (the Lord Bishop of Rochester occupying the chair), the subject for discussion was "The Present Disuse of Art in the Church: its Reasons and Results," and the chairman called on Dr. Biggs to read his paper on the subject. Dr. Biggs prefaced his remarks by calling attention to the attempts which the Church had made towards Art in the latter part of the nineteenth century, as instanced in such buildings as All Saints', Margaret Street, Keble College Chapel, and several others. He also dealt with some of the difficulties which clergy and committees had to meet in dealing with artists. In his opinion greater accuracy of detail was wanted in the artistic treatment of biblical scenes and subjects. Many people visited Palestine now, and these travellers were often disappointed because the actual country was so unlike any representations of it they had seen in their churches. At the same time he appealed to artists to treat sacred subjects in the traditional manner which had been laid down by the Church, and which distinguishes sacred art from secular. Mr. Lionel Cust, F.S.A., the next speaker, referred at length to the historical view of the subject, pointing out the causes which led to the practical abolition of Art in our churches at the time of the Reformation. Mr. Selwyn Image disagreed with Dr. Biggs as to the distinction between sacred and secular art. Art was a man's self, and his individuality must impress itself on everything that he did. In work intended for a church the artist confined himself to certain subjects, and in work intended for a drawing-room he dealt with other subjects, but beyond this there could be no further distinction between sacred and secular art. He reminded the meeting that in days when Gothic churches were built people also built Gothic houses. Every artist had an individuality and each age had a style. Therefore, if any person or firm offered to do work in any style required, it might be taken for granted that the work would be bad. Although we lived in an age which (for many social and economic reasons) had no style, yet every artist had an individuality, which must impress itself on everything he did. After an interesting discussion in which Canon Armitage Robinson, Mr. H. Wilson, Mr. John P. Seddon, Mr. W. S. Frith and Mr. T. Stirling Lee took part, the Bishop of Rochester expressed his appreciation and thankfulness for the remarks made. The two professions had much in common, and the Church Crafts League would justify its existence if it only called together such meetings as the one they were having that evening. The next general meeting of the League will be held early in May. Any non-members caring to attend will be very welcome. Tickets can be obtained from the secretary of the League at the Church House, Westminster, S.W.



PRINCE ARTHUR'S CHAPEL, WORCESTER CATHEDRAL.

Site of the New County Hall. ONE of the first things of importance to come before the new County Council will be a proposal to provide a new county hall. "We have good authority for saying," says the "Daily Chronicle," "that a site has already been valued for the Council's proposed new home. When the scheme is disclosed, it will be found that the site is not on the line of route of the new thoroughfare from Holborn to the Strand, as it was believed would be the case, but is in a prominent part of Westminster. It is estimated that the cost of the new municipal buildings, including that of the site, will not fall far short of two millions sterling."

Register of Old London Buildings. PART I. of a "Register" of buildings of historical or architectural interest in the parishes of Bow, Poplar and Bromley has now been completed and will shortly be on sale. The work was begun by the "Committee for the Survey and Registration of the Old Memorials of Greater London," but three and a half years ago it was taken over by the London County Council. In this first part the most interesting section deals with Tudor House, Bromley, which Mr. Laurence Gomme, the secretary of the County Council, and other antiquaries made so gallant an effort to preserve some years ago. Bromley Hall and the old Palace of Bromley also figure in the volume, which is well illustrated.

The Cargo of Greek Statues. ON page 83 of last week's issue we drew attention to the remarks made by the Athens correspondent of the "Times" with regard to the Greek statues and other objects of art recently recovered from the bottom of the sea near the Island of Cerigo. This gentleman came to the conclusion that the statues formed part of the cargo of the ship in which the conqueror Sulla deposited many of the great masterpieces of Greek art, and that therefore they have been at the bottom of the sea for perhaps 2,000 years. Mr. George Middleton held the opinion that instead of being under water for so long they had only been there since the coasting vessel carrying Lord Elgin's marbles was shipwrecked. The present Lord Elgin now writes to the "Times" as follows:—"The story of the loss of the *Mentor*, and the idea that some of the marbles that were on board of her may still be found in the sea off Cerigo, have made their appearance several times in my recollection. Perhaps you will allow me to mention that on the first of these occasions, some thirty years ago, I consulted the then keeper of the department of Greek and Roman Antiquities in the British Museum (Mr. Newton), and that we were satisfied, after an examination of records in the Museum and in my possession, that the cargo had been recovered and brought to England. In any case the present interesting discovery carries us back to another and more ancient disaster, for the bronzes of which it consists were certainly no part of my grandfather's collection." Photographs of the statues were exhibited recently at a meeting of the Hellenic Society.

APPRENTICESHIP IN THE BUILDING TRADES.

MR. JOHN GOOD (hon. secretary of the Dublin Master Builders' Association) delivered an address last week before the Architectural Association of Ireland on "Some Aspects of the Labour Question as Applied to the Building Industry." He urged that the present condition of affairs made it imperative to educate more thoroughly and more efficiently the mechanic who produced the work; as what the public wanted was a good article produced at the cheapest rate. The building industry in Dublin was a large one, comprising about 7,000 hands. It was generally recruited from apprentices, indentured and unindentured, for improvers. The indentured apprentice system—a very ancient one—had been found to yield the best results, although it was capable of immense improvement, both in instruction, inspection and examination. The conditions of apprenticeship varied considerably in the different trades. In the carpenters' and joiners' the apprentices were principally bound to the employers, and there was no limit as to numbers. But the percentage of apprentices and improvers in Dublin was too small, being 22·8 per cent. instead of 33·33. In the second largest skilled branch of the building industry—the stone and bricklayers'—the apprentices were required to be the sons of members of the trade; but under some circumstances the rule was relaxed on the payment of a £30 fee. One would scarcely have thought that this hereditary or "caste" system could exist in these enlightened days. There were only 3·2 per cent. of apprentices in this trade, and 1 per cent. of improvers—less than one apprentice and improver to every 24 men, instead of one to three, or 33·33 per cent.—the necessary number to keep the trade in a healthy and efficient state. In the plastering trade, where the "caste" system in regard to apprentices also prevailed and no improvers were allowed, there were 25 per cent. of apprentices, or 8·33 per cent. below the necessary number. In the stonecutting trade, in which, except under extreme circumstances, the "caste" system also prevailed, the percentage of apprentices was 19. In other words, in the entire trade there were 17·75 on an average of apprentices, as against the necessary 33·33 per cent.—an appalling deficiency of 600 being the result. Thus sufficient men were not being trained to fill the gaps in the ranks, tradesmen were coming from other places to fill the positions, and thousands of able, but unskilled, hands were forced to seek a living elsewhere. The speaker, having pointed out the necessity of a sound theoretical training and practical instruction in these trades, in which there were no standards at present, said that the work of technical instruction should be in the hands of a public or Government department, and he trusted the present system would soon be amended through the exertions of the new Department of Technical Instruction, for which they owed a deep debt of gratitude to Mr. Horace Plunkett.

Normanton Church.—A faculty has been granted authorising the enlargement of the parish church and the removal and re-interment of bodies which would be interfered with. The cost of enlarging the church will be £3,000,

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Flemish Architecture.

CARDIFF.—WALES writes: "Kindly recommend a book on Flemish architecture. Are there any (such as Brandon and Collins' 'Gothic') fully illustrated?"

No book has been published on Flemish architecture, but the book we should recommend would be "La Renaissance en Belgique et à Hollande," illustrated with 384 lithographed plates of façades, details in stone and wood, carved architectural ornaments, furniture and woodwork, iron and metal work, from some of the most remarkable buildings in Antwerp, Andenarde, Amsterdam, Breda, The Hague and other historical towns. The examples are selected by Professor Ewerbeck and Messrs. Mouris and Lietew, and the work was published in two volumes, half morocco, royal folio, £7 10s., 1891. A very similar book is "Ortwein: Deutsche Renaissance," a collection of 300 lithographic plates from the large compilation of Ortwein and Scheffers published at £36 (out of print), second edition. The illustrations comprise examples of various ornamental and architectural details, including elevations, sections, specimens of stone and woodwork for doors and doorways, windows, balconies, designs for fountains, sculptured capitals, &c.; two volumes, imperial folio, 1893, cloth, 28s. These books are obtainable from Mr. B. T. Batsford, 94 High Holborn, W.C.

Salary in Arrear.

CONSTANT READER writes: "Would an architect's assistant receiving a weekly salary be entitled to payment in full of any salary owing in the event of his employer becoming bankrupt? Does 'salary' come under the heading of 'wages'?"

Yes. "Salary" is the same thing as "wages," and an architect's assistant can claim payment in full of any salary, not exceeding three months', that may be due to him at the date of bankruptcy of his employer, and in priority of all other creditors, except others situated like himself. G. A. T. M.

Permission to Measure French Government Buildings.

LONDON, N.—E. L. G. writes: "Where can I obtain permission to measure and sketch buildings belonging to the French Government, such as the Louvre, Luxembourg Palace, &c.?"

Application should be made by means of a letter written in English to the French Minister of Public Works, stating the buildings which it is proposed to sketch, including any cathedrals. This letter had best be sent in an unsealed envelope and enclosed in a covering letter to his Britannic Majesty's Ambassador at Paris, asking him to be so kind as to forward it to the proper quarter. If it were accompanied by one of the R.I.B.A. travelling cards it would be the more likely to receive attention. We would suggest that the secretary of the Institute might be seen and his advice taken. G. A. T. M.

Pupils' Articles.

LONDON, N.W.—R. G. writes: "Nearly six years ago I was taken into an architect's office without any premium on the understanding that I was to remain there for three years without any salary. I am now about to leave. My principal would give me my articles dated back, but fears it may be illegal. Should the articles be on stamped paper? If so, what would be the best method of getting over the date?"

We would suggest that the case would be perfectly well met by a carefully worded testimonial from the employer stating that Mr. .... had served him from .... to .... in all respects as an articled pupil, though no indentures of apprenticeship had ever been formally entered into. A few words as to steadiness, attention to work, and progress made might then be added, when the document would become as valuable evidence as articles themselves, and could be produced instead of them if ever they should happen to be called for. G. A. T. M.

War Department Building Prices.

CARDIFF.—STUDENT writes: "I should be glad to know where I can obtain the 'War Department Schedule of Building Prices' which is revised triennially."

We have known several attempts to obtain copies of these schedules, but have never known them to succeed without official authorisation. The published price is 12s. 6d., and the publishers are Messrs. Harrison and Son, St. Martin's Lane, W.C. G. A. T. M.

Ball-room Floor.

AMBLESIDE.—PUMPS writes: "To give the necessary spring, with stability, in order to make a good ball-room floor, what is the best method to adopt, and what size joists would be required to construct the floor of a public hall 45ft. by 25ft.? It will be on the ground floor, with no basement."

The common rule for fir joists is half-span in ft. + 2 = depth of joist in inches, and thickness $= \frac{1}{3}$ depth. Suppose there be two sleeper walls, the span would be, say, 8ft., and the scantling by above rule 6 by 2, but this would be rather light for dancing upon; 7 by 2 would be more suitable. This would, however, give rather a stiff floor. With a single sleeper wall down the centre and 9 by 3 joists there would be more spring in it; but for full span of 25ft. without sleeper walls timber joists would not be sufficient, as 11 by 3 is only suitable up to 15ft. span. HENRY ADAMS.

Construction of Regenerator Furnaces.

LONGTON, STAFFS.—T. T. writes: "Where can I obtain full particulars of the construction of a regenerator furnace, similar to that used in connection with the Hull crematorium lately illustrated in the BUILDERS' JOURNAL? I understand the principle, but am at a loss as to the position and working of the air-flues."

We are unable to say where the desired information may be found. A member of the staff engaged on Siemen's regenerative furnace work expresses the opinion that the best plan would be for our correspondent to try to examine the furnace at the Hull crematorium. It is perhaps opportune to mention that among the list of patents published in our last issue was one (2,663 of 1900) for regenerative furnaces taken out by W. P. and G. B. Gibbons, Dibdale Fireclay Works, Lower Gornal, Staffs. A specification of it could be obtained for 8d. from the Patent Office, Southampton Buildings, Chancery Lane, W.C.

Alterations Involving Unspecified Work.

ELGIN.—R. B. P. writes: "I am carrying out alterations to a house in which I find that a very considerable amount of extra work will be necessary, including a good deal of work for which there are no rates in the schedule. Can I expect this extra work to be carried out at the schedule rates or such other rates as the quantity surveyor may determine—the ordinary clause as to alterations and additions to the work being observed—or will not the contractor claim in respect of work for which there is no schedule rate such rates as he may determine by time and material, always remembering that the work is the reinstatement of old work by new?"

In such a case as this it is generally most equitable to determine the charges by time and material, for which properly vouched accounts should be rendered weekly. Something of the sort may always be expected where alterations are to be made, and the schedule, if drawn up with forethought, will contain items of labour at per hour for different tradesmen, and also items of the principal materials likely to be used, in small amounts, such as bricks at per 100 and mortar at per hod. G. A. T. M.

Contract Stamping.

HALIFAX.—X. Z. writes: "Is a 6d. stamp sufficient for a contract?"

Unless the contract is under seal, when it would become a deed, a sixpenny agreement stamp is sufficient. A postage stamp of this value may be used, but it is best to take the agreement within a fortnight of its signature to a post office, when it will be sent to Somerset House to have the proper stamp impressed upon it. G. A. T. M.

Sewer Velocity.

WELLINGTON.—VELOCITY writes: "A sewer is 20in. diameter, 2,500ft. long, with a fall of 4ft. Running quarter-full and half-full, what is the velocity in feet per second in each case, and would such velocity be sufficient to make the sewer self-cleansing?"

The velocity of the sewage flow in a sewer 20in. diameter, laid with a gradient of $\frac{1}{625}$ (4ft. in 2,500ft.), when flowing one-quarter full is 1·85ft. per second; and 2·41ft. per second when flowing one-half full. To provide thoroughly self-cleansing drains and sewers, it is necessary that the velocity of the sewage flow through drains of less than 12in. diameter should be not less than 3ft. per second when flowing one-quarter full. For sewers 12in. to 24in. in diameter a velocity of $2\frac{1}{2}$ft. per second should be obtained when flowing one-quarter to one-half full, whilst for larger sewers the velocity should be not less than 2ft. per second. A slight additional fall is necessary to ensure the 20in. sewer being self-cleansing.

T. E. C.

Cubing Contents of Hopper.

EDINBURGH.—G. M. writes: "I shall be glad to know how to calculate the cubic contents of a grain hopper for a stable. The mouth measures 3ft. by 5ft., and has straight sides for a depth of 1ft. The hopper then tapers like a funnel, the total length from mouth to neck being 2ft. 9in. Is there a fixed size for a bushel of corn?"

For cubic contents of hopper, parallel part $= lbd = 5 \times 3 \times 1 =$ ... ... 15.

Frustum of pyramid $\frac{1}{3}h\,(A + a + \sqrt{A \times a})$, $h =$ 1ft. 9in. $= 1{\cdot}75$, $A = 5 \times 3 = 15$, $a =$ 1ft. $7\frac{1}{2}$in. × 9in. $= 1{\cdot}625 \times {\cdot}75 = 1{\cdot}21875$, then $\frac{1}{3} \times 1{\cdot}75\,(15 + 1{\cdot}21875 + \sqrt{15 \times 1{\cdot}21875}) = \frac{1{\cdot}75}{3}(16{\cdot}21875 + 4{\cdot}275) =$ ... ... 11·955.

Small parallel part 1ft. $7\frac{1}{2}$in. × 9in. × $1\frac{1}{2}$in. = ... ·15234.

Top of trunk $h\left(\frac{L+1}{2}\right)b = 9''\left(\frac{1'\,7\frac{1}{2}'' + 1}{2}\right)$

$9'' = {\cdot}75 \times {\cdot}75 \times \frac{1{\cdot}625 + 1}{2} =$ ... ... ·7383.

Total contents $15 + 11{\cdot}955 + {\cdot}15234 + {\cdot}7383 = 27{\cdot}8456$ cub. ft., 6·232 gals. in 1 cub. ft., 8 gals. in 1 bushel, therefore $\frac{8}{6{\cdot}232} = 1{\cdot}2837$ cub. ft. in 1 bushel, and $\frac{27{\cdot}8456}{1{\cdot}2837} = 21\frac{7}{10}$ bushels in hopper above floor line.

HENRY ADAMS.

Workmen's Compensation.

HOLMFIRTH.—ACKERSPIRE writes: "A stone-dresser is engaged in his work when a piece of stone from one of the hammers (not his own) cuts through one eye and completely destroys the sight. This will totally incapacitate him from his ordinary occupation. His employer now asks him to send in his claim under the Workmen's Compensation Act. (1) What can he claim—a lump sum or an annuity? (2) If a lump sum, what should be the approximate amount, or if a weekly sum how much per week? He earned about 30s. per week. (3) What procedure would you advise?"

(1) The man has a good case under the Workmen's Compensation Act, provided he gave notice of the accident as soon as possible after the happening thereof, and before leaving the service voluntarily. After the second week he is entitled to a weekly payment during his disablement not exceeding 50 per cent. of his average weekly earnings during the previous year. If he has not been so long employed,

then the average will be taken on his wages during the time he was in the employment of the same employer, which apparently would be 15s. a week. (2) See previous answer. (3) The Act has puzzled the Court of Appeal, and nothing should be done without consulting a solicitor. A. O. H.

Brick Walls and Rough-Cast.

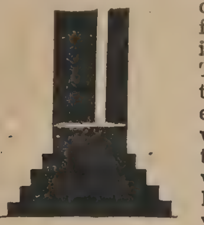
LONDON, W.—A. W. P. writes: "Is a one-brick wall with cement rough-cast sufficient for a gentleman's small country cottage? Would it exclude the damp? How is the rough-cast specified?"

Nothing could be more suitable, while it would exclude the damp perfectly, except in a position where it would be exposed to frequently-recurring driving rain. The specification might run somewhat as follows:—"Render the walls externally where coloured yellow on elevations with Portland cement mortar, in the proportion of 1 of cement to 3 of sand, and cover this with a thin setting coat of neat cement on to which a mixture of peagrit pebbles, ground stone lime and colouring matter to approved tint is to be dashed while wet. Properly form in same all window reveals, angles and weatherings to string courses." G. A. T. M.

Footings for Hollow Walls.

HOVE.—FANTINA writes: "Kindly show the proper method of laying bricks in the footings required for a hollow wall so as to comply with the usual by-laws, namely, that they shall be in regular offsets with the bottom course of footings double the thickness of the wall. Should a 9in. wall be on the inside or not?"

The brickwork should be solid up to damp-course level, with footings formed as usual, as shown in accompanying sketch. The 9in. wall should be on the inside, so that all joist ends may rest in a dry wall, and the thicker portion be provided for weight-carrying. An illustrated article on hollow walls was published in the issue of the BUILDERS' JOURNAL for January 16th last. G. A. T. M.



English Tour for Architectural Student.

EDINBURGH.—STUDENT writes: "I intend to travel for four months this summer in England for the purpose of studying old work, especially Gothic, between about 1200 and 1400. I should be glad if you could suggest a useful tour, and indicate a few of the most important buildings worthy of study."

We would suggest that the time be divided into periods of three weeks or a month each, and be allotted to districts somewhat as follows, more attention being paid to small churches and houses than to cathedrals, and permission to sketch obtained in advance in every case. *Oxfordshire* (principally Norman).—Christchurch Cathedral, Oxford; St. Peter's in the East, Oxford; Tewkesbury Abbey; and churches at Barton, Begbrooke, Cassington, Great Barford, Handborough and Iffley. *Yorkshire* (principally Early English).—York, Beverley and Ripon Minsters; Selby, Fountains, Whitby and Rivaulx Abbeys; and churches at Adel (Norman), Skipton, Hedon and Patrington. *Lincolnshire* (principally Early English).—Lincoln Minster; Crowland Abbey; and churches at Stamford, Heckington, Navenby and Grantham. *The Nene Valley*, *Northamptonshire* (principally Decorated and Tudor).—Peterborough Cathedral; churches at Oundle, Northampton, Warmington, Polebrook, Fotheringay and Castor; and Lyfden Hall. *Essex and Suffolk* (principally Perpendicular, flintwork).—Churches at Lavenham, Long Melford, Ufford, Cromer, Coddenham and Heigham; Norwich Cathedral should also be visited. Numerous other districts are equally good, while each of these contains much more good material than is indicated. Kent, Gloucestershire, Somersetshire and Cheshire are particularly rich, and the work of each district is distinct. G. A. T. M.

Brickwork.

LONDON, N.—STUDENT R.I.B.A. writes: "(1) How can you renovate old brickwork to make it look like new? (2) In the interior of a public building when the brickwork is to show, and not to be plastered, how can you make a good job? Is it customary to distemper the brickwork under such circumstances?"

(1) The joints may be raked out, the whole surface rubbed down smooth and made good where necessary with coloured cement, and the joints repointed. Cement pointing is best, but if a glaringly new appearance be needed tuck pointing in narrow lines of white putty is generally used. It must be remembered that to rub away the old face of the brickwork destroys its durability while giving it temporarily a new appearance. (2) Well-selected facing bricks of even colour pointed in blue-ash mortar looks very well internally, and is frequently used in brick churches. The surface can be distempered, but it rarely looks well, and this is not often done except for workshops. On the other hand carefully-selected glazed or salt-glazed facing bricks of various colours can be made to look very handsome, but the jointing should be narrow and in cement.
G. A. T. M.

Architecture of Holland and Belgium.

DUTCH writes: "Are there any standard illustrated works on the architecture of Holland and Belgium?"

See reply concerning Flemish architecture on the previous page.

Right of Light.

HECKMONDWIKE.—IN DOUBT writes: "A wishes to alter his premises by bringing out the front to the building line of the street as shown in sketch (not reproduced). Can B object, as he has a window into passage?"

As B's ancient light would undoubtedly be obstructed, it would be best to come to terms with him before commencing operations. Probably, as the window is small, it is not used for any purpose for which much light is required, and the money value of any damage done would then be merely nominal. If it light a larder or a W.C., for instance, no judge would award damages at all; yet even in such a case it is best to arrange terms amicably in advance.
G. A. T. M.

Makers of Large Clocks.

CHESTERFIELD.—F. C. R. J. writes: "Kindly give the names and addresses of some large clock manufacturers."

Sir John Bennett, Ltd., 65 Cheapside; J. W. Benson, Ltd., Ludgate Hill, E.C.; E. Dent & Co., 61 Strand, W.C.; J. J. Stockall & Sons, 6, 8, and 10 Clerkenwell Road, E.C.

Valuer's License for Architect.

HALIFAX.—QUESTIONER writes: "Is it necessary for an architect to hold a valuer's license when getting out builders' final accounts in connection with extras and deductions in contracts?"

There is no necessity for an architect to hold a valuer's license for this purpose, nor is it usual. G. A. T. M.

Signing Contracts.

HALIFAX.—TOMAS A DOUTER writes: "When a partner signs the name of his firm on a contract, should he write his own name or initials under the firm's title? Should the witness do the same?"

The firm's signature is quite sufficient, each partner having the legal right to use it. Similarly the witness is witness to the signature of the firm and not of the individual. G. A. T. M.

A Church Set on Fire by Lightning.—Last week the German Church adjoining the German Hospital in Ritson Road, Dalston Lane, London, N.E., was struck by lightning. The organ loft and the choir gallery were burnt out. The organ was completely destroyed and the pipes melted.

Professional Practice.

Barry Dock.—A new fire-engine station has been erected in Court Road. The site of the station is adjoining the Barry Dock Police Station. It has a main frontage of 40ft. to the Court Road, abuts on Watson Street at the rear, and is centrally situated in the town. The building is three storeys high and, in addition to the engine-room, contains superintendent's and firemen's apartments, watch-room, stables, and hose-drying tower, 60ft. high. The main building consists of engine-room, 36ft. by 25ft.; watch-room, 15ft. by 11ft.; store-room, 12ft. by 6ft.; and stair-well, 11ft. by 6ft. Outbuildings: Stables, 25ft. by 12ft., containing two-stall and loose box with a large loft above, 16ft. by 12ft.; harness-room, 12ft. 6in. by 7ft.; workshop, 12ft. by 8ft.; three coal houses, 7ft. by 3ft. 9in., and yard. The first and second floor consist of bedroom and other domestic offices. The hose-drying tower is 7ft. by 7ft. clear, and 60ft. high, and has a door from the bath-room of each floor to a gallery running around the inside. From the highest gallery an iron ladder is fixed to the platform on the tower top, which is roofed by a lead-covered dome. The building has accommodation for one family and about a dozen firemen. The engine-room has accommodation for an engine and escape, the engine being supplied by Messrs. Shand, Mason and Co., London, and the fire escape by Bayleys, London. The main entrance doors to the engine-room are folding, and opened by Messrs. Shand, Mason and Co.'s patent instantaneous fittings, as also are the doors of the stables adjoining the engine-room. A pit for engine-cleaning purposes has been constructed in the yard. The staircase is of stone, and leads from the engine-room and watch-tower to the upper floors. The rooms of the ground floor, outbuilding, stables and yard are paved with Ward's patent granite paving, with the exception of the watch-room, which is floored with flooring boards, the upper rooms being floored with grooved and tongued boarding. The walling throughout is done in stock brickwork, faced with Cattybrook wire-cut buff-coloured bricks, the elevation being relieved with red brick, blocking courses and bands, the window heads and sills and other mouldings being of red sandstone. The engine-room is lined throughout with white glazed bricks from floor to ceiling, the stable being lined with a glazed brick dado 4ft. 6in. high, all the other rooms being finished in plaster. A building has been built in the yard at the rear, consisting of a mortuary 13ft. 6in. by 7ft. 6in., and a post-mortem room 13ft. 6in. by 8ft. 6in. The latter contains a post-mortem table, a sink, wash-hand basin and a fireplace, while the former is fitted with two slate slabs. They are divided by a pair of sliding-doors. The building is lined throughout by white glazed bricks, from floor to ceiling, and is ventilated with louvres in roof. The face work is in buff-coloured bricks, in keeping with the main building. The architect was Mr. J. C. Pardoe, A.M.I.C.E., Surveyor to the District Council. The contractors were Messrs. Jones Brothers, the amount of their tender being £2,785.

Kingseat, Newmachar.—A new asylum is being erected by the Aberdeen City District Lunacy Board. The architect is Mr. A. Marshall Mackenzie, A.R.S.A., F.R.I.B.A. Mr. Edgar Gauld is the contractor for the mason work of the asylum, and his tender nearly £30,000. The total cost is estimated at about £100,000. The site is on the north side of the railway. about a mile nearer Aberdeen than Newmachar Station. It slopes pleasantly to the south, and has a background of rising ground, well wooded. The asylum is designed on the model of Alt Scherlutz, in Prussian Saxony, on what is known as the "segregated" system, in which the patients are classified and housed in separate groups, according to the nature of their mental trouble. There will be in all twenty-seven separate buildings, and they will occupy a site of about 30 acres. The rest of the estate will be utilised for farming and gardening work for the patients and for recreation ground. The buildings are arranged in three sections — namely, medical, industrial, and general. In the medical section there are eight separate buildings, as follows :—One hospital, divided into separate wings for physically sick, infirm and recent acute mental cases (bedridden) ; also an isolation ward for suspected cases of infectious disease, two observation villas, two closed asylums and two convalescent hospitals. The industrial section consists of six villas, three for males and three for females, accommodating from 30 to 40 in each, the patients being grouped according to their fitness or unfitness for freedom from supervision and for outdoor work. Villa No. 1 is intended for patients capable of working who are untrustworthy in consequence of restless habits, of delusions likely to render them troublesome or offensive, or of a tendency to run away or to commit offences. Villa No. 2 is designed for patients able to work who require somewhat less day supervision than the former, but who cannot be wholly trusted to themselves. Villa No. 3 is intended for working patients requiring a minimum of day supervision and no night supervision. The general section consists of 12 separate buildings — namely, administration offices and boardroom, kitchen and stores, laundry, workshops, boilers, homes for nurses and female servants, medical superintendent's residence, steward's house, lodges for gardener and engineer, cottages for married attendants, greenhouses, recreation hall, and mortuary. The accommodation provided at present will suffice for 550 patients, and it is proposed that future extension should be met by the erection of additional villas from time to time as required. In view of this prospective addition to the number of villas, the central buildings, such as the kitchen, hospital and boilerhouse, have been made sufficiently large to meet the requirements of an asylum of 700 patients, instead of 550. The patients will dine in the separate villas, their meals being sent from the general kitchen in specially-constructed trollies. It was at one time suggested to have an underground electric tramway for this service, but this system was dropped on the score of too great first cost. The architectural treatment of the various buildings is plain. No two of the villas are exactly alike, and the effect of such diversity will be to impart a picturesque and village-like appearance, without any suggestion that the villas form part of a large institution. The style is the late Scottish Renaissance, and a good deal of effect is obtained by combining the local granite obtainable on the estate itself with some of the other lighter-coloured granites from quarries in the neighbourhood.

Napsbury. — The new Middlesex County Asylum, now in course of erection at Napsbury, near to St. Albans, is situated on a site of about 416 acres, which cost £45,000. The plans for the buildings have been prepared by Mr. Rowland Plumbe, F.R.I.B.A., to accommodate about 1,150 patients, and are to cost some £385,000, or an average of £311 per patient. The designs have been executed on a principle somewhat uncommon to the South of England, the idea being to classify the patients to the utmost possible extent. It will consist, first of all, of a main asylum, much of the usual type, to accommodate 650 patients; next a separate hospital for purposes of admission and observation and medical treatment, accommodating 234 patients. In addition to this separate villas will be provided for working patients of both sexes ; also for male and female paying patients. The usual isolation hospital and post-mortem department will be provided together with a medical officer's house, bailiff's house, and the usual adjuncts. The main asylum will consist of detached wards communicating with the administrative block and each other by means of corridors. The wards are arranged "en eschelon" in order that the fullest benefit may be obtained from the sun's rays. Separate wards are provided for sick and infirm patients, epileptic patients, chronic refractory patients, and a sufficient number of chronic and working patients of both sexes. This building will be built on a plateau sheltered from the north and facing south, with lovely views over the surrounding country. The male and female blocks will be divided in the centre by a large common dining-room, above which will be the recreation hall. North of this will be the kitchen and kitchen offices, and on each side of the kitchen court are placed the dining, mess and recreation rooms, and on the female side a nurses' bedroom block will be also provided. North of the kitchen courtyard are situated the stores, which communicate through a long corridor having various offices on each side with the front administration block. This corridor contains the usual visitors' rooms. The workshops will be arranged in a courtyard set back from the administration block, and forming a separate court, in which are the boiler house, engine house, dynamo rooms, water tower, bakery, and other buildings. The laundry will be also set back, and situated to the west of the front administration block. In connection with the laundry, a proper disinfecting block will be provided, and the mortuary and post-mortem department will be provided in the rear of the workshops. The matron and chief attendant will have separate houses built in the large quadrangles, which will separate the administration block from the communicating corridors. The wards will be two storeys high, the administration block and the nurses' home being three storeys high. The contract for the foundations of these buildings has been let to Messrs. Holloway brothers, builders, of London. The hospital will be arranged on a system as similar as it can be to the main asylum, all the blocks being detached, and communicating by means of corridors. The south blocks are devoted to hospital and convalescent cases. The east and west blocks will be devoted to the sick and infirm cases, for whom a wide sunny corridor will be provided for inclement weather. Verandahs are also provided for these cases. The exercise corridors are divided by the dining hall, north of which is placed the kitchen, and on each side of the kitchen court are the attendants' mess rooms. North of the kitchen court the storerooms are provided. Two blocks of wards for isolation cases are arranged in connection with the last-named wards, but are detached, although communicating by a covered way. In front of these buildings will be provided a set of rooms for the use of the medical staff and nurses, and for the examination of all cases admitted. Right and left of this block are situated the recent and acute observation wards, two storeys high, the other wards being only one storey high. Separate villas for the working patients will be dotted about the estate in positions which will be most convenient for their work. A big dining-room will be provided, with a separate sitting-room and a large recreation room. On the upper floors are situated the bedrooms, with the usual accommodation. The paying patients' villas are somewhat similar in plan, but contain more sitting-rooms. The isolation hospital will contain accommodation at present for only six patients, but there is facility for increasing this should it be required. The medical officer's house will contain a dining-room, drawing-room and study, with the usual bedroom and other accommodation. The bailiff's house will contain two sitting-rooms and four bedrooms. The accommodation in the lodges will consist of a living room, kitchen, and three bedrooms, The buildings will be lighted by electricity.

Keystones.

Mr. W. D. Caröe, architect to the Ecclesiastical Commissioners, has been appointed architect to the Dean and Chapter of Canterbury in room of the late Sir Arthur Blomfield.

The late Lieutenant-Colonel Henry Cowell Boyes, London Rifle Brigade, has bequeathed £100 each to the Architects' Benevolent Society and the Charitable Fund of the Surveyors' Club.

Messrs. Nestlé are pushing forward their milk factory building scheme at Tutbury, the architect for which is Mr. G. Yates Mills, of Derby. Thirteen tenders were received for the work, and that of Messrs. Walkerdine, of Derby, at £9,275, has been accepted. The next lowest was that of Mr. H. Edwards, of Burton (£9,555), and the highest tender was £11,250. The contract is separate from the foundation.

The Roman Paving at Dorchester which was recently discovered has been picked up and relaid in the Dorset County Museum by Messrs. B. Ward and Co., Limited, of 38 and 39 Parliament Street, Westminster.

An Edzell Competition.—The School Board of Edzell some time ago invited a number of architects to submit plans for a new school. On the recommendation of the assessor, the plans submitted by Mr. D. Wishart Galloway, of 2 Market Street, Brechin, have been accepted.

New Sunday Schools at Cowes have been erected by the Wesleyan Methodists on a piece of land having a frontage to both Birmingham Road and Westhill Road, and upon which a chapel is also in course of erection. The entrance to the schools is in Westhill Road, and the chapel faces Birmingham Road. The school proper is about 48ft. by 50ft., is fitted with incandescent light, and is well ventilated. It will accommodate about 400. There is also another room specially set apart for the younger scholars, for whom sitting accommodation for 150 is provided. There are also several classrooms.

The new Roman Catholic Cathedral in Ashley Gardens, Westminster, is now, so far as the shell is concerned, practically completed, and the expenditure incurred in its erection up to date exceeds £140,000. It is Cardinal Vaughan's intention to carry out at once the completion of the campanile, the total height of which, when surmounted by its cross, will be 283ft. Efforts are being made to decorate one or two side chapels with marbles and mosaics before the date of opening, which as yet has not been decided upon. The new Archbishop's house, connected with the apse of the cathedral by a bridge, will, it is expected, be ready for occupation about June.

The Surveyors and Auctioneers' Clerks' Provident Association held its annual general meeting last week, Mr. Daniel Watney presiding. The report showed that the number of members on December 31st was 153, a net gain of 16 on the year. The financial position of the association is highly satisfactory. The income for the year was £542, against £514 for the preceding 12 months. The expenditure was £206, leaving a net balance of £335. Added to the amount brought forward on December 31st, 1899, a grand total of £5,150 is shown. On account of sick allowance £83 has been paid. Mr. J. Payne was elected the hon. secretary in the place of Mr. W. Cudlipp, who resigned his office because of inability to attend the meetings.

Greek Portrait Sculpture.—At the Royal Institution, Professor Percy Gardner recently began a course of lectures on "Greek and Roman Portrait Sculpture." He pointed out that portraits of Greek women were few and far more conventional than those of men, for, though we owed to the Greek chisel some of the most lovely types of female beauty in existence, the Greek sculptor did not revel in the beauty of women as in that of men. In the time of Phidias and Polycletus undignified subjects and unsatisfactory features were avoided, but in the fourth and third centuries a drift could be traced towards naturalism and individuality, although the portraits were free from slavish adherence to details of accident, and the artist set the man before us rather in the manner of Plutarch than of the modern newspaper interviewer.

R.I.B.A. Prizes and Studentships, 1901-1902. The subjects for these prizes are as follows :—*Essay Medal and* 25 *guineas*: Essay on the employment of the Order in Renaissance and modern architecture. *Measured Drawings Medal and* 10 *guineas*: As usual. *Soane Medallion and* £100: Design for a swimming bath for men. *Pugin Studentship, Silver Medal and* £40: As usual. *Godwin Bursary, Silver Medal and* £40: As usual. *Owen Jones Studentship, Certificate and* £100: As usual. *Tite Prize, Certificate and* £30: Design for a royal memorial chapel in the Italian style. *Grissell Gold Medal and* 10 *guineas*: Design for a roof, in iron, concrete and glass, of a picture gallery. *Ashpitel Prize*: As usual. *Arthur Cates Prize*: As usual. Copies of the pamphlet containing full particulars of these prizes may be obtained at the office of the Royal Institute of British Architects, 9 Conduit Street, W., price 3d. each

Queen Victoria Memorial.—The committee appointed by the King recommend that a memorial be erected in the neighbourhood of the Abbey and Palace of Westminster, or of Buckingham Palace; the memorial to include as its most prominent feature a statue of the Queen. A sub-committee has been appointed to consider the means which should be employed to carry this recommendation into effect. Subscriptions will be received by the Lord Mayor at the Mansion Houae, E.C., and at the Bank of England.

Peabody Buildings.—The governors, who administer the fund of £500,000 left by the late Mr. Peabody for the erection of tenements for the poor, in their thirty-sixth annual report announce that they have invested in land and buildings for the artisan and labouring poor of London £1,290,047. On the Herne Hill estate twelve blocks of buildings of forty rooms each are now in course of construction. The average rent of each dwelling last year was 5s. 0½d., and the average weekly wage of the head of each family in residence was £1 3s. 1¼d.

Paper Houses.—Professor Bickerton, of Christchurch, New Zealand, has invented a new method of constructing houses. The constructive material is brown paper freely tarred over. It is said to present many advantages over the old-fashioned brick-and-mortar system. The cost to begin with is less than one-fifth of that of the cheapest wooden buildings, but it is somewhat strange to learn that the brown paper, when chemically treated, resists wind and weather, and that the houses built of it remain watertight, while their wooden neighbours are leaking. Warmth is secured by double walls with a space of four inches between.

Ballinasloe Church, built in 1842, was almost completely destroyed by fire on May 11th, 1899. It has now been restored. Mr. S. Hill, of Cork, was the contractor. The joint architects are Messrs. J. F. Fuller and W. H. Kempster. The old plan has been adhered to but enlarged, the chancel being extended and a new organ chamber erected. There is a pitch-pine ceiling, and two new Bath stone transept arches add to the symmetry of the interior. The steps to the chancel are of Portland stone, and the walls plastered in dull grey. The seats, like the ceiling, are of pitch pine. The stonework for the new chancel extension was supplied from Brackernagh Quarry, adjacent to Ballinasloe, and worked on the church premises. The aisles are laid with concrete, 1in. lower than the flooring of the pews, and are thus ready for tiling. New louvre windows have been placed in the tower.

Mr. William Wilkinson, architect, formerly of Beaumont Street, Oxford, died recently at the age of 81 years. While deceased was actively pursuing his profession he enjoyed a high reputation as an architect, principally in designing country houses and model farm buildings for noblemen and gentlemen in different parts of the country, and even so far away as Switzerland. He also designed many of the best houses of the Norham Manor Estate, Oxford, and, amongst other buildings, St. Edward's School, Summertown, the Randolph Hotel, Oxford, and the new part of the Warneford Asylum, Headington. He was the author of a very useful work on domestic architecture, entitled "English and Country Houses," published by James Parker and Co., Oxford, which reached a second edition.

New Buildings in Aberdeen.—Plans of the following new buildings have been sanctioned:—Two dwelling houses on the east side of Bayview Road; workshop at rear of premises, 190 King Street, Messrs. Brown and Watt, architects; alterations in connection with premises, 379 Union Street, Mr. John Cameron, architect; shop on the north side of Jasmine Terrace, Mr. James Rodger, builder; electricity works at Dee Village, for the Town Council, per Mr. Alexander Smith, gas engineer; alterations at 8 Castle Street, Mr. R. G. Wilson, architect; alterations in connection with Art Gallery, for the Town Council, per Mr. A. Marshall Mackenzie, architect; and seven dwelling houses on the north side of Fonthill Terrace, Messrs. D. and J. R. M'Millan, architects.

The Chapel of the Pyx, a very interesting remnant of the most ancient part of the conventual buildings of Westminster Abbey, has been transferred to the custody of the First Commissioner of Works. The chapel occupies two bays under the convent dormitory, which extends along the eastern side of the cloisters. The dormitory is now partly used as the great schoolroom of Westminster School and partly as the Chapter library, and the Pyx Chapel under it is now the largest fragment of the Confessor's buildings left to us.

A Leeds Improvement Scheme.—At the local government enquiry held recently at Leeds as to the improvement scheme, by which it is proposed to sweep away the Quarry Hill districts, Mr. E. B. Martin, assistant engineer to the Corporation, said that the population of the Quarry Hill area was 10,577 of which number 9,234 belonged to the labouring classes. There were 254 persons living in lodging-houses. The total cost of carrying out the scheme would amount to £523,034.

Stockport Workhouse Competition.—Mr. Thos. Worthington, F.R.I.B.A., the assessor selected to judge the plans submitted for a workhouse infirmary proposed to be erected for the Board of Guardians of the Stockport Union at Stepping Hill, has given his award. Seven sets of plans had been submitted in competition for the three prizes of £150, £100, and £50 offered by the Guardians for the most suitable plans. The assessor has awarded these premiums as follows:—(1) Messrs. Giles, Gough and Trollope, 28 Craven Street, Charing Cross, London; (2) Mr. H. Percy Adams, Woburn Place, Russell Square, London; (3) Mr. Charles W. Hardy, Rodney Street, Liverpool.

The Glasgow and West of Scotland Technical College Architectural Craftsmen's Society held a meeting last Friday, Mr. Isaac Low, jun., presiding, when papers by Mr. Jas. McKissack and Mr. Jas. Lochhead, A.R.I.B.A., were read on the subject of "Planning of Tenements for the Labouring Classes." Mr. McKissack confined his remarks to tenements constructed on the "Common Close" system with reference to the arrangement of two-roomed and single-apartment houses on the most sanitary and economic principles. The lecturer advocated the desirability of providing a separate W.C. to each house. Mr. Lochhead's paper dealt with that type of dwelling to which entrance is gained from a balcony at each flat with a common stair placed either outside or within. In planning on the "balcony" system, the following points were to be considered: The staircase should be placed outside preferably, and no bedrooms should overlook the balcony, the scullery or W.C. being placed adjacent to this. The site would require to be fairly level in order that the level balcony might serve a sufficient stretch of building.

The T-Square Club is to be congratulated on the success of its first ladies' concert, held last Wednesday evening. The use of the Royal Opera House, Covent Garden, was granted by Messrs. Frank Rendle and Neil Forsyth for the occasion, and everything had been done by the committee for the comfort of the guests, of whom there were about 600. Sir James W. Szlumper, D.L., J.P., M.Inst.C.E., acted as chairman, and carried through a varied and entertaining programme of thirty items. It is unnecessary to single out any one of these for special mention, as all were good. It will be sufficient to mention the names of the performers. The vocalists were Madame Marian McKenzie, Miss Marie Titiens, Miss Norah Maguire and Messrs. Arthur Winckworth, W. R. Maxwell and George Blackmore. Miss Alice Liebman played two violin solos; and the Sisters Skinner gave selections on the banjo. Recitations were given by Mr. A. L. Ebsworth and musical sketches by Mr. Herbert Harvey. Dr. Byrd-Page also gave a clever exhibition of sleight of hand entitled "Ancient and Modern Mystery." During the evening the string band of the Royal Engineers played several popular selections, and it was close on midnight when the company dispersed. It said much for the energy and capacity of the secretary, Mr. T. Wilson Aldwinckle, that such an excellent programme was presented without a hitch.

COMING EVENTS.

Wednesday, March 13.

Edinburgh Architectural Society.—Mr. J. Stuart Syme on "San Micheli and his Work."

Northern Architectural Association.—Annual Meeting at 7.30 p.m.

Edinburgh Architectural Association.—Mr. J. M. Brydon, F.R.I.B.A., on "The Work of Cockerell," 8 p.m.

Sanitary Institute.—Council Meeting at 5 p.m., Mr. Christopher Childs, M.A., M.D., on "Ventilation: Success and Failures of the Methods at Present in Use," 8 p.m.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration at Broake, Roberts and Co.'s Chemical Works, Stratford, at 2.30 p.m.

Society of Arts.—Mr. F. B. Behr on "The Proposed High-speed 'Monorail' between Liverpool and Manchester," 8 p.m.

Architects' Benevolent Society.—Annual General Meeting of Subscribers and Donors, in the rooms of the Royal Institute of British Architects at 5 p.m.

Architectural Association (Discussion Section)—Mr. H. P. G. Maule on "The Architect and the Garden." 7 p.m.

Institute of Sanitary Engineers.—Meetings of Examination and Literary Committee at 3 p.m.; General Purposes and Finance Committee at 4 p.m.; Election Committee at 5.15 p.m.; and Sessional Meeting at 7 p.m.

Institution of Civil Engineers.—Students' Visit to the Millbank Street Pumping Station of the London Hydraulic Power Company, at 2.30 p.m.

Thursday, March 14.

Royal Institution.—Prof. Percy Gardner on "Greek and Roman Portrait Sculpture"—III., 3 p.m.

Society of Antiquaries of London.—Meeting at 8.30 p.m.

Institution of Electrical Engineers.—Mr. A. C. Eborall on "Polyphase Sub-station Machinery," 8 p.m.

Sheffield Society of Architects and Surveyors.—Paper by Mr. E. W. Mountford, F.R.I.B.A.

Carpenters' Hall, London Wall.—Mr. W. E. Riley on "Dwellings for the Working Classes," 8 p.m.

Friday, March 15.

Architectural Association.—Mr. H. B. Measures on "Rowton Houses," 7.30 p.m.

Epidemiological Society.—Dr. J. T. R. Davison on "The Effects of Sewerage and Water Supply upon the Behaviour of Enteric Fever in Buenos Ayres"; Dr. N. P. Schierbeck on "The Enteric Fever Mortality in Copenhagen from 1828-1898," 8.30 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Mr. W. C. Tyndale, M.I.C.E., on "Sanitary Appliances," 7 p.m.

Birmingham Architectural Association.—Mr. Bulkeley Creswell on "Registered Architecture: an Analysis of the Society of Architects' Prescriptions," 6.45 p.m.

Institution of Mechanical Engineers.—Mr. A. N. Connett on "Combined Trolley and Conduit Tramway Systems," 8 p.m.

Sanitary Inspectors' Association.—Annual Dinner at the Holborn Restaurant, W.C., 6.30 p.m.

Saturday, March 16.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration at the Sewage and Destructor Works, Ealing, at 2.15 p.m., conducted by Mr. Charles Jones, M.I.C.E.

Architectural Association.—Third Spring Visit to Stanhope House, Park Lane, W., by permission of the architect, Mr. W. H. Romaine-Walker, 2.80 p.m.

Institution of Junior Engineers.—Anniversary Dinner at Westminster Palace Hotel at 7 p.m.

Monday, March 18.

Society of Arts (Cantor Lectures).—Major P. Cardew on "Electric Railways"—II., 8 p.m.

Surveyors' Institution (Junior Meeting).—Mr. L. S. Wood, P.A.S.I., on "Income Tax, Schedule A," 7 p.m.

Victoria Institute, 8 Adelphi Terrace, W.C.—Rev. T. Hunter Boyd on "The Relation of Religion and Art," 4.30 p.m.

Leeds and Yorkshire Architectural Society.—Mr. Francis Bond, M.A., F.G.S., on "French and English Abbeys" and Election of Officers, 6.30 p.m.

Royal Institute of British Architects.—Mr. C. Harrison Townshend on "The Art of Pictorial Mosaic," 8 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Prof. Henry Robinson, M.I.C.E., on "House Drainage," 7 p.m.

Liverpool Architectural Society.—Mr. Neville Hampson on "The Restoration of Ordsall Hall," 6 p.m.

Tuesday, March 19.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Professor Henry Robinson, M.I.C.E., on "Water Supply, Sources of Supply and Distribution," 7 p.m.

The United Club.—Dinner at the Criterion Restaurant. Mr. Ritchie opens discussion on the "Housing of the Working Classes."

Glasgow Architectural Association.—Mr. P. Fyfe on "Sanitary Dwellings."

Cardiff, South Wales and Monmouthshire Architects' Society.—Meeting.

Architectural Association of Ireland.—Mr. R. C. Orpen on "Architectural Amenities," 7.45 p.m.

Wednesday, March 20.

Society of Arts.—Mr. Percy T. Macquoid on "Evolution of Form in English Silver Plate," 8 p.m.

Geological Society of London.—Meeting at 8 p.m.

Ruskin Society of Birmingham.—The Right Rev. the Lord Bishop of Ripon on "Dante," 8 p.m.

British Archæological Association.—Meeting at 8 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration in the District of St. George's, Hanover Square, at 2 p.m. Conducted by Mr. Albert Taylor.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
	BUILDING.		
Mar. 15	Halifax—House	—	J. F. Walsh and G. Nicholas, Lancs. and Yorks. Bank Chbrs, Halifax.
" 15	Abertridwr, Wales—Chapel	—	J. John, 7 Thomas Street, Abertridwr, Caerphilly.
" 15	Bowness—Alterations	—	J. Stalker, Architect, Kendal.
" 15	Caerphilly, Wales—Chapel	—	J. John, 7 Thomas Street, Abertridwr, Wales.
" 15	Dewsbury—Cottages	—	C. H. Marriott, Son and Shaw, Church Street Chambers, Dewsbury.
" 15	Elgin—Convenience	—	Burgh Surveyor's Office, Elgin.
" 15	Glascoed, Welshpool—House	—	E. Bremner-Smith and Bremner, Architects, Oswestry.
" 15	Invercauld, Scotland—Additions	—	Jenkins and Marr, 16 Bridge Street, Aberdeen.
" 15	Manchester—Washhouse	Joint Workhouse Committee	A. J. Murgatroyd, 23 Strutt Street, Manchester.
" 16	Blackburn—Hall	—	Stones and Stones, 10 Richmond Terrace, Blackburn.
" 16	London, N.—Renovation, &c.	—	Vicarage, St. John's Church, Highbury Vale.
" 16	Ballymacreely—Villa	J. Osborne	W. J. Fennell, Architect, Scottish Provident Buildings, Belfast.
" 16	Warrington—Bricks, Cement, Fireclay	Water Committee	J. Deas, Municipal Offices, Warrington.
" 16	Tregaron—Master's House	County School Managers	M. Morgan, Tregaron.
" 17	Hayle, Cornwall—Stables, &c.	Messrs. Mudge, Surgeons	Maddern, Coachman, Hayle.
" 18	Altaghaderry, Ireland—School House	—	E. J. Toye, Architect, Strand, Londonderry.
" 18	Cardiff—Warehouse	Joseph Spiridion	Veal and Sant, Architects, Cardiff.
" 18	Glasgow—Works	Corporation	Public Works Office, 64 Cochrane Street, Glasgow.
" 18	London—Builders' Materials	Metropolitan Asylums Board	Board, Embankment, London, E.C.
" 19	Carlisle—Archway	Corporation	H. C. Marks, 36 Fisher Street, Carlisle.
" 19	Carlton—Engine House	Urban District Council	R. Whitbread, Carlton, near Nottingham.
" 19	Farnworth, Lancs—Car Shed	Urban District Council	W. J. Lomax, 11 Fold Street, Bolton.
" 19	Southampton—Stores	London and South-Western Railway Co.	J. Dixon, Docks Department, Southampton.
" 19	Inglewhite—Police Station	Lancs County Council	H. Littler, County Offices, Preston.
" 19	Aberdovey—House	Mrs. Arthur Tomlins	G. T. Bassett, Architect, Aberystwith.
" 19	London, N.—School	Edmonton School Board	J. Moule, School Board Offices, Brettenham Road, Edmonton.
" 19	L. and S. W. Railway—Stores	Directors	Dock Superintendent, Southampton.
" 19	Edmonton—School	School Board	H. W. Dobb, 54 and 55 London Wall, E.C.
" 19	Edmonton—School	School Board	J. Moule, School Board Offices, Brettenham Road, Upper Edmonton.
" 20	Pontypool—Widening, &c., Bridge	Urban District Council	D. J. Lougher, Bank Chambers, Pontypool.
" 20	Blairgowrie, Scotland—Enlargement, &c.	—	Anderson, Chapman and Co., Solicitors, Blairgowrie.
" 20	Brentwood, Essex—School	Asylums Board	C. and W. Henman, 64 Cannon Street, E.C.
" 20	Cwmaman, Wales—Houses	Cwmaman Cottage Company, Limited	J. Llewellin, Smith and Davies, Architects, Aberdare.
" 20	West Ham—Building Material	Guardians	Master of Workhouse, West Ham.
" 20	Eastleigh—Cemetery Boundary Wall and Railing	Urban District Council	W. Stringfellow, Surveyor, Council Offices, Leigh Road, Eastleigh.
" 21	Manchester—Shed, &c.	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
" 21	Belper—Lodge, &c.	Joint Hospital District Committee	Hunter and Woodhouse, Architects, Belper.
" 22	Feltham—Infants' School	School Board	W. R. Low, 10 Basinghall Street, E.C.
" 22	Bolton—Enlargements	Commissioners	Postmaster, Bolton.
" 22	Wimbledon—Additions of Electricity Generating Station	Urban District Council	C. H. Cooper, Surveyor's Office, The Broadway, Wimbledon.
" 23	Ashby-de-la-Zouch—School, &c.	Governors	Barrowcliff and Allcock, Architects, Loughborough.
" 23	Buxton—Wall, &c.	Gas Committee	H. Barker, Gas Engineer, Town Hall, Buxton.
" 23	Gravesend—Fish Market	Town Council	E. J. Bennet, 189 Parrock, Gravesend.
" 25	Elland, Yorks—Public Baths	Urban District Council	G. Hepworth, 20 Bradford Road, Brighouse.
" 25	Newport—Foundations	Corporation	R. H. Haynes, Borough Engineer, Newport, Mons.
" 25	Norton Lees—School	School Board	J. Norton, Alliance Chambers, George Street, Sheffield.
" 27	Hever, Kent—Isolation Hospital	Joint Hospital Board	Gleed and Belcher, 8 & 9 Martin's Lane, Cannon Street, E.C.
" 29	Hull—Refuse Destructor Buildings	Corporation	A. E. White, City Engineer, Town Hall, Hull.
" 30	London, N.W.—Orphanage	St. Pancras Female Orphanage School	S. G. Goss, 3 Broad Street Buildings, Liverpool Street, E.C
	ENGINEERING.		
Mar. 15	Warrington—Pumping Plant	Corporation	J. Deas, Municipal Offices, Warrington.
" 16	Cunscough, Lancs—Rebuilding, &c., Bridge	Main Road and Bridges Committee	W. C. Hall, County Offices, Preston.
" 16	Rakefoot, Lancs—Bridge Works	Main Road and Bridges Committee	W. C. Hall, County Offices, Preston.
" 16	Edinburgh—Electric Lighting	Corporation	Electrical Engineer's Office, Dewar Place, Edinburgh.
" 16	Trowbridge—Heating	—	H. Ledbury, Timbrell Street, Trowbridge.
" 16	Lowestoft—Removal of old outfall	Corporation	G. H. Hamby, Town Hall, Lowestoft.
" 16	Bollington—Pipelaying, &c.	Urban District Council	W. H. Radford, C.E., Albion Chambers, King Street, Nottingham.
" 18	Cardiff—Steam Pipes, &c.	Corporation	A. Ellis, Old Post Office Buildings, Cardiff.
" 18	Belfast—Jetties	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
" 18	Dundee—Sea Wall	Town Council	W. Mackison, Municipal Offices, 91 Commercial Street, Dundee.
" 18	Bangor, Ireland—Water Mains	Urban District Council	E. L. Woods, Bangor, Ireland.
" 19	Shipley, Yorks—Electrical Fittings	Urban District Council	Council, Manor House, Shipley.
" 19	Llanfair, Wales—Railway	Cambrian Railways Company	A. J. Collin, Oswald Road, Oswestry.
" 20	Christiania—Axles, &c.	—	Railway Station Offices, Christiania.
" 20	Ilkeston—Widening Bridge	Bridges and Highways Committee	J. S. Story, County Surveyor, County Offices, Derby.
" 23	Buxton—Gasholder Tank, &c.	Gas Committee	H. Barker, Gas Engineer, Town Hall, Buxton.
" 23	Clitheroe, Lancs—Water-supply Works	Rural District Council	J. Eastham, Church Street, Clitheroe.
" 25	Newport, Mon.—Constructional Steelwork, &c.	Corporation	H. F. Parshall, 8 Princes Street, Bank, London, E.C.
" 25	Gravesend—Electrical Equipment for Tramways	Electric Tramways Committee	C. Dade, British Electric Traction Company, Donington House, Norfolk Street, Strand, London, W.C.
" 27	Warrington—Electric Tramways	Corporation	Preece and Cardew, 13 Queen Anne's Gate, Westminster, S.W.
" 27	Kettering—Refuse Destructor	Urban District Council	T. R. Smith, Market Place, Kettering.
" 28	London, N.—Wharf and Lay-bye	Hackney Borough Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 28	Dorchester—Sewage Purification Works	Town Council	G. J. Hunt, Borough Engineer, Guildhall, Dorchester.
" 29	Sunderland—Cables, &c.	Corporation	J. F. C. Snell, Dunning Street, Sunderland.
" 30	Penryn, Cornwall—Harbour Works	Harbour Authority	J. P. Jenkins, Town Hall, Penryn.

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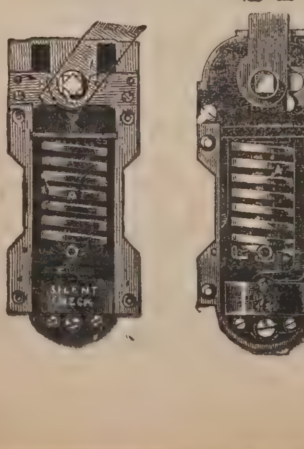

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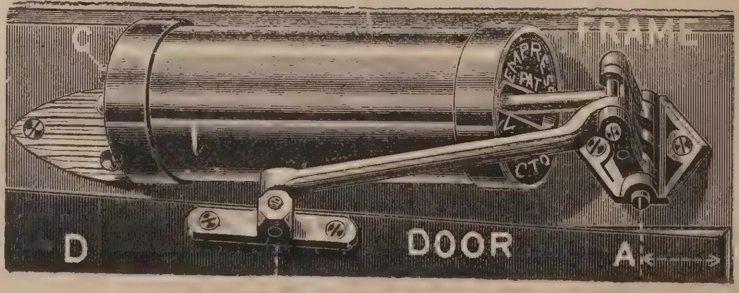

Fig. 1, as fixed on face of door.

Greatest Variety of Fanlight Openers and Gearing in the World.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	IRON AND STEEL.		
Mar. 15	London, S.W.—Iron Castings	Wimbledon Urban District Council	Electric Lighting Works, Durnsford Road, Wimbledon.
„ 15	Cromer—Pipes	Urban District Council	A. F. Scott, Church Street, Cromer.
„ 16	Bollington, Cheshire—Pipes, &c.	Urban District Council	W. H. Radford, Albion Chambers, King Street, Nottingham.
„ 16	Warrington—Lead Piping	Water Committee	J. Deas, Municipal Offices, Warrington.
„ 16	Warrington—Wrought-iron Bolts, &c.	Sanitary Works Committee	J. Deas, Municipal Offices, Warrington.
„ 16	Preston—Ironmongery	Corporation	Borough Treasurer's Office, Town Hall, Preston.
„ 18	London, S.W.—Ironmongery	Asylums Committee	Asylums Committee, 6 Waterloo Place, S.W.
„ 18	London, S.E.—Drain Pipes, Lime	Bermondsey Borough Council	F. Ryall, Town Hall, Spa Road, Bermondsey.
„ 20	St. Helens, Lancs—Ironwork, Manhole Covers	Urban District Council	G. J. C. Broom, Borough Engineer. St. Helens.
„ 20	Christiania—Sleeper Plates	Norwegian State Railway	Manager, Railway Office, Christiania.
„ 20	Reading—Manhole Covers	Corporation	J. Bowen, Engineer and Surveyor, Town Hall, Reading.
	PAINTING AND PLUMBING.		
Mar. 15	London, S.W.—White lead, varnish and oils, &c.	Wimbledon Urban District Council	Electric Lighting Works, Durnsford Road, Wimbledon.
„ 16	Warrington—Oils, paints, &c.	Water Committtee	J. Deas, Municipal Offices, Warrington.
„ 16	Preston—Paints and oils, &c.	Corporation	Borough Treasurer's Office, Town Hall, Preston.
„ 20	Fulham—Plumbing	Metropolitan Borough	W. J. H. Denslow, Town Hall, Walham Green.
„ 23	Gravesend—Painting	Town Council	E. J. Bennett, 189 Parrock Street, Gravesend.
	ROADS AND CARTAGE.		
Mar. 15	Bradfield, Berks—Road repairs	Rural District Council	J. Forrester, Theale, nr. Reading.
„ 15	Chailey, Sussex—Flints, &c.	Rural District Council	C. Patrick, 89 High Street, Lewes.
„ 15	Durham—Materials, &c.	Rural District Council	G. Gregson, Surveyor, Durham.
„ 15	London, S.W.—Broken granite	Wimbledon Urban District Council	Electric Lighting Works, Durham Road, Wimbledon.
„ 15	Flaxton, Yorks—Materials	Rural District Council	J. Peters, 4 New Street, York.
„ 16	York—Materials	Corporation	A. Creer, City Engineer, Guildhall, York.
„ 16	Withington, Lancs—Road Materials, &c.	Urban District Council	A. H. Mountain, Town Hall, West Didsbury, Manchester.
„ 16	Walton-on-Thames—Various	Urban District Council	C. J. Jenkins, Engineer and Surveyor's Office, Walton-on-Thames.
„ 16	Edinburgh—Roads	Corporation	City Road Surveyor, City Chambers, Edinburgh.
„ 16	Lancaster—Blocks	Corporation	J. Cook, Borough Surveyor, Town Hall, Lancaster.
„ 16	Nuneaton—Broken stone	Urban District Council	J. S. Pickering, Surveyor, Nuneaton.
„ 16	Burnley—Limestone and macadam	Rural District Council	S. Edmondson, Surveyor to the Council, Burnley.
„ 16	Padiham, Lancs—Materials	Urban District Council	J. Gregson, Surveyor, Padiham.
„ 18	Sunbury-on-Thames—Kerbing, &c	Urban District Council	H. F. Coales, Surveyor, Sunbury-on-Thames.
„ 18	Prestwich, Lancs—Street Works	District Council	L. A. Orford, Chester Bank, Bury New Road, Prestwich.
„ 18	Acton, Middlesex—Relaying	County Council	H. T. Wakelam, Surveyor, Guildhall, Westminster, S.W.
„ 18	Erith, Kent—Materials	Urban District Council	Council Offices, Erith, Kent.
„ 18	Hull—Whinstone, &c.	Sculcoates Rural District Council	J. P. Chatham, Lincoln's Inn Buildings, Hull.
„ 18	Tutbury—Materials	Rural District Council	H. S. Teboitt, 76 Outwood Street, Burton on-Trent.
„ 18	Warrington—Street and Passage Works	Paving Committee	T. Longdon, Town Hall, Warrington.
„ 18	Wigton, Cumberland—Road Maintenance	Rural District Council	B. Brown, Bank, Wigton.
„ 18	Worksop—Slag	Blyth Rural District Council	F. Hopkinson, 40 Bridge Street, Worksop.
„ 19	Blackhill, Durham—Road-making	Knitsley Joint Burial Board	G. T. Wilson, 121 Durham Road, Blackhill.
„ 19	Lower Bebington, Cheshire—Carts, &c.	Urban District Council	Surveyor's Office, New Chester Road, New Ferry.
„ 19	Wrexham—Roadstone	Town Council	Borough Surveyor, Wrexham.
„ 19	Downham Market, Norfolk—Materials	Rural District Council	H. Wayman, Union Offices, Downham Market.
„ 19	Lower Bebington, Cheshire—Materials	Urban District Council	Surveyor's Office, Lower Bebington.
„ 19	Middlesbrough—Materials	Rural District Council	W. H. Dixon, Surveyor, Kirby-in-Cleveland, near Stokesley, R.S.O.
„ 19	Walsall—Road-making, &c.	Corporation	Borough Surveyor's Office, Bridge Street, Walsall.
„ 19	Tynemouth—Footpaths	Corporation	J. F. Smillie, Borough Surveyor, Tynemouth.
„ 20	Reading—Broken Granite, &c.	Corporation	J. Bowen, Town Hall, Reading.
„ 20	St. Helens, Lancs—Granite sets and kerbs	Urban District Council	G. J. C. Broom, Borough Engineer, St. Helens.

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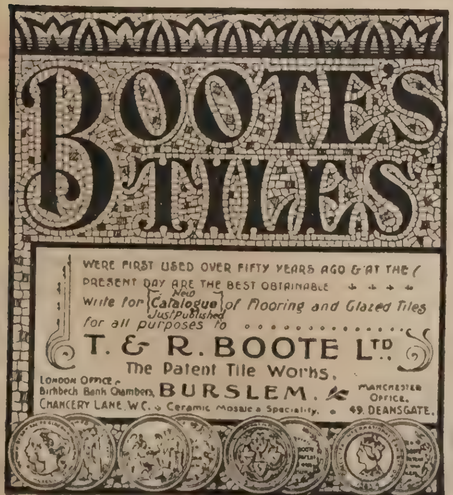

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COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		Road and Cartage.—*Continued.*		
Mar.	20	Nelson—Granite	Corporation	B. Ball, Borough Engineer and Surveyor, Nelson.
"	20	London, S.W.—Broken Granite, &c.	Fulham Borough Council	W. J. H. Denselow, Town Hall, Fulham.
"	20	Stokesley—Materials	Rural District Council	W. H. Dixon, Surveyor, Kirby-in-Cleveland, near Stokesley, R.S.O.
"	21	Burnley—Materials	Highways and Sewage Committee	Borough Surveyor's Office, Town Hall, Burnley.
"	21	Sutton, Surrey—Broken Granite, &c.	Urban District Council	C. C. Smith, Municipal Offices, Sutton, Surrey.
"	22	Walthamstow—Concrete Flags	Urban District Council	E. Morley, Surveyor, Town Hall, Walthamstow.
"	23	Hounslow—Cartage, Broken Granite, &c.	Heston Urban District Council	P. G. Parkman, Town Hall, Hounslow.
"	23	Blackburn—Granite Setts	Highways Committee	W. Stubbs, Municipal Offices, Blackburn.
		SANITARY.		
Mar.	15	Cromer, Norfolk—Sewers, &c.	Urban District Council	A. F. Scott, Church Street, Cromer.
"	15	Sandiacre, near Nottingham—Scavenging	Shardlow Rural District Council	J. W. Newbold, Becket Street, Derby.
"	16	Nuneaton—Sanitary Pipes, &c.	Urban District Council	J. S. Pickering, Surveyor, Council Offices, Nuneaton.
"	16	Sandiacre, near Nottingham—Sewer	Shardlow Rural District Council	Gorman and Ross, Architects, Sandiacre.
"	16	Rugeley, Staffs—Sewers, &c.	Urban District Council	Pritchard, Green & Co., 37 Waterloo Street, Birmingham.
"	18	London, S.E.—Drain Pipes	Bermondsey Borough Council	F. Ryall, Town Hall, Spa Road, Bermondsey.
"	18	Hale, Cheshire—Sewers	Urban District Council	F. J. Lobley, Albert Road, Hale, Cheshire.
"	18	Newark—Scavenging	Urban District Council	G. Sheppard, Town Hall, Newark.
"	18	Rutherglen, Scotland—Sewers	Town Council	Warren and Stuart, 115 Wellington Street, Glasgow.
"	19	Wrexham—Drain Pipes	Town Council	Borough Surveyor, Wrexham.
"	19	Belfast—Earthenware Pipes	Corporation	Superintendent of Works, Town Hall Street, Belfast.
"	20	London, S.W.—Pipes	Fulham Borough Council	W. J. H. Denselow, Town Hall, Fulham, S.W.
"	20	St. Helens, Lancs—Sewer and Drain Pipes	Urban District Council	G. J. C. Broom, Borough Engineer, St. Helens, Lancs.
"	21	Sutton, Surrey—Sanitary Pipes	Urban District Council	C. C. Smith, Municipal Offices, Sutton, Surrey.
		TIMBER.		
Mar.	16	Lancaster—Wood Blocks	Streets Committee	J. Cook, Town Hall, Lancaster.
"	18	London—Timber	Metropolitan Asylums Board	Board Offices, Embankment, London, E.C.
"	18	London, S.W.—Timber	L.C.C. Asylums Committee	Asylums Committee, 6 Waterloo Place, S.W.
"	18	London, W.—Timber	Great Western Railway Co.	G. K. Mills, Paddington Station, London.
"	20	London, S.W.—Timber	Fulham Borough Council	W. J. H. Denselow, Town Hall, Fulham.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
March 25	Basford—Sewerage Scheme	——	C. J. Spencer, Clerk, Public Offices, Basford
April 30	Keighley—Public Library	£50, £30, £20	W. H. Hopkinson, Borough Engineer, Town Hall, Keighley.
June 10	Ennis, co. Clare—Additions, &c., to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.

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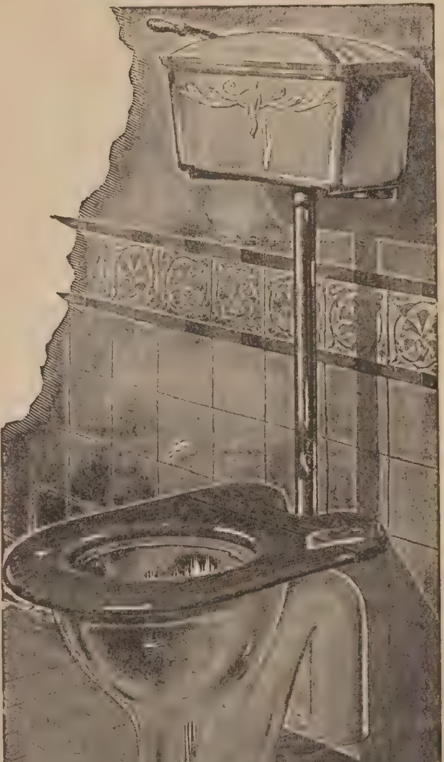

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Candidates must be of full age of 25 years, properly skilled and educated in the art and practice of building and drainage, and hold a Certificate of the Royal Institute of British Architects, or the Institute of Civil Engineers, or of the Institute of Surveyors, as required by Section 97 of the above quoted Act.

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By order,
EDWARD CROWNE,
Clerk of the Council.

Coombes Croft House,
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ACTIVE PRACTICAL PLASTERER (35) just finished large job, desires ENGAGEMENT with Builder to carry through work, solid or fibrous. Good references. Abstainer.—W. E. KENT, Lumley Road, Horley, Surrey.

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New Companies.

Holliday and Greenwood, Limited.

Registered February 22nd to acquire the business of builders and contractors as carried on by J. and S. Holliday and B. J. Greenwood at Loughborough Park Works, Brixton, and to carry on business as builders, contractors, architects, brick and tile makers, decorators, furnishers, &c. Capital £60,000 in £1 shares.

William Oliver, Sons and Howard, Limited.

Registered March 4th to acquire the business of wainscot, mahogany, and hardwood and timber merchants carried on at 120 Bunhill Row and elsewhere as William Olliver and Sons, and the business of hardwood merchants carried on at 109 Fenchurch Street, E.C., and Crown Wharf, Canning Town, as W. W. Howard Brothers and Co. Capital £290 000 in £1 shares. The first directors are R. Farrant, A. L. Howard, E. T. Oliver and J. E. Oliver.

Herbert Alexander and Co., Limited.

Registered February 21st to adopt an agreement made by this company with H. Alexander for the acquisition of the business of manufacturers of special brick, tile, cement, and other machinery and tools, &c., as carried on at the Queen's Engineering Works, Holbeck, Leeds, Yorkshire, as Herbert Alexander and Co. Capital £50,000 in £1 shares. The first directors are H. Alexander, G. H. Bowden and H. L. Massingberd Mundy. Registered office: 99 Water Lane, Leeds, Yorkshire.

Greaves, Bull and Lakin, Limited.

Registered February 25th to acquire the business carried on at Stockton, Wilmcote, Harbury and Birmingham, Warwickshire, and at Paddington, W., and to carry on the businesses of burners, manufacturers, importers and explorers of, and merchants and dealers in, and agents for, blue lias and other lime, chalk, cement, stone, sand, bricks, pipes, tiles, concrete, artificial stone, earthenware, pottery, &c. Capital £100,000 in £100 shares (750 preference). The first directors are M. A. Lakin, E. L. Lakin, R. Lakin, H. G. Lakin and E. L. Lakin. No initial public issue.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the Work.

BRISTOL.—For the erection of a domestic subjects centre at Mina Road Schools, for the Bristol School Board. Mr. W. P. Saunders, Rupert Chambers, Quay Street, Bristol, architect :—

	£	s.	d.		£	s.	d.
W. Church	1,489	0	0	E. Love	1,320	0	0
W. G. Bindon	1,411	0	0	Wilkins & Gosling	1,300	0	0
H. & W. Roe	1,401	12	0	E. Walters	1,295	0	0
J Hatherley	1,397	0	0	H. Taylor	1,292	11	4
S. Williams	1,380	0	0	S. R. Gorvett	1,283	0	0
G. Humphreys	1,351	0	0	E. Clark	1,220	0	0
H. W. & E. J. Neale	1,330	0	0	J. Slade*	1,219	10	0

* Accepted. [All of Bristol.]

CARDIFF.—For the erection of an electric tramway power station at Roath, Cardiff, for the Corporation. Mr. W. Harpur, M.I.C.E., borough engineer :—

	£	s.	d.		£	s.	d.
Beams & Nephew	20,247	18	0	D. Thomas & Son	17,400	0	0
W. Thomas & Co.	18,825	11	1	E. Turner & Sons	17,000	0	0
Price Bros.	18,604	0	0	J. S. Chubb & Co.	16,569	0	0
W. T. Morgan	17,800	0	0	W. Symonds & Co.,* Rectory Road, Cardiff	16,100	0	0
J. Allen	17,761	0	0				
C. C. Dunn	17,575	0	0				

* Accepted subject to confirmation by Council.

CARDIFF.—For forming, metalling, paving, kerbing, and channelling Moorland Road and Seymour Street, for the Corporation. Mr. W. Harpur, M.I.C E., borough engineer :—

Moorland Road.

	£	s.	d.
J. Andrews, Cardiff	1,755	13	5
C. Davies, Cardiff	1,377	9	9
Osmond, Ely, Cardiff	1,555	7	9
J. Rich,* Cardiff	1,310	4	2

Seymour Street.

	£	s.	d.
J. Andrews	429	0	4
C. Davies	329	11	2
Osmond	324	12	2
J. Rich*	318	4	8

* Recommended for acceptance.

EVESHAM.—For the construction of filters at their outfall works, also for the construction of intercepting sewers and other works connected therewith, for the Corporation :—

	£	s.	d.
Johnson Bros., The Barton, Hereford	8,267	5	10
G. G. Rayner, Potter's Bar, Middlesex	6,624	1	0
H Roberts, Brook House, Ashford, Ludlow	6,230	0	0
J. Mackay, 39 Bearwood Road, Smethwick	5,454	10	8
Epsley & Co., Limited, Evesham	5,310	0	0
H. Holloway, Bilston Road, Wolverhampton	5,227	0	0
C. E. Carden, Penkridge, Staffordshire	5,174	0	0
T. Vale, Stourport	5,090	16	0
J. Owens, Skinner Street, Wolverhampton	4,699	0	0
A. Braithwaite & Co.,* Leeds	4,453	11	6

* Accepted.

KING'S LYNN, Norfolk.—For work at Church of St. Mary, West Winch, near King's Lynn. Mr. Herbert J. Green, architect and surveyor, 31 Castle Meadow, Norwich :—

	£	s.	d.		£	s.	d.
W. F. Smith	544	1	0	W. H. Brown	480	10	6
Robert Dye	499	0	0	Bardell Bros.*	447	10	0

* Accepted conditionally. [All of King's Lynn.]

KING'S LYNN, Norfolk.—For work at Rackhams Almshouses, King's Lynn. Mr. Herbert J. Green, architect and surveyor, 31 Castle Meadow, Norwich :—

	£		£
W. H. Brown	1,488	Bardell Bros.	1,294
Tash & Langley	1,421	Renant Bros.	1,280
Robert Dye	1,384	W. F. Smith	1,178

All of King's Lynn.]

LITTLEHAMPTON.—For providing and laying 12in. and 10in. diameter cast-iron pipes, with smaller diameter pipes, special castings, irregulars, valves, penstocks, and other fittings in connection with waterworks at Warningcamp, Batworth Park, and Crossbush, near Arundel, Sussex, for the Littlehampton Urban District Council. Mr. H. Howard, Town Offices, Littlehampton, engineer :—

	£	s.	d.
J. & T. Binns, Croydon	3,400	0	0
W. Griffiths & Co., London	3,310	0	0
Duke & Ockenden, Littlehampton	3,292	13	0
Wilkinson Bros., London	2,942	0	0
Cooke & Co., London	2,900	0	0
T. Parkinson, Peterborough	2,784	0	0
A. E. Nunn,* Tenterden	2,410	0	0

* Accepted. [Engineer's estimate, £3.500.]

LONDON, S.W.—For the erection of a children's home in Millman Street, Chelsea, for the Guardians of St. George's (Hanover Square) Union, London. Mr. Edwin T. Hall, F.R.I.B.A., 57 Moorgate Street, E.C., architect :—

	£
M. Pearson, London	19,278
Shillitoe & Sons, Bury St. Edmunds	17,100
R. L. Tonge, Watford	16,990
Foster Bros., Norwood Junction	16,969
Perry Bros., London	16,813
Hibberd Bros., Lambeth	16,710
J. Appleby, London	16,696
W. S. Beaton, London	16,525
C. Gray Hill, Coventry	16,400
W. J. Renshaw, Putney	16,392
Marriage & Withrington, Croydon	16,300
Leslie & Co., London	16,279
Massom & Sons, Twickenham	15,958
Harris & Wardrop, Limehouse	15,597
Braid, Pater & Co., London	15,200
Sabey & Son, Islington	15,167
Johnson & Sons, Leicester	15,031
H. L. Holloway, Deptford	14,979
Gough & Co., Hendon	14,454
Kingerlee & Sons, Oxford	13,967
Foster & Dicksee,* Rugby	12,917
W. Smith, London	12,708

* Accepted.

MERTHYR, Wales.—For rebuilding of portion Bird-in-Hand Inn, Merthyr :—

	£
Lloyd, Church Street, Merthyr Tydfil	2,250
S. Hawkins, Merthyr Tydfil	1,510
A. J. Howells, Roath Park, Cardiff	1,850
W. H. Ingleson,* 49 Beda Road, Cardiff	1,300

* Accepted.

NEWPORT, Isle of Wight.—For the execution of certain reparations to the masonry of the tower of the church of St. Thomas, at Newport, Isle of Wight :—

	£	s.	d.
T. Jenkins, Newport, Isle of Wight	2,396	10	0
H. Stevens & Co., Northam, Southampton	2,340	0	0
W. H. Churcher, Stoke Road, Gosport	1,985	16	0
J. Ball & Son, Cowes, Isle of Wight	1,897	0	0
J. Thompson & Co., Peterborough	1,726	0	0
J. G. & W. Jolliffe Bonchurch, Isle of Wight	1,695	0	0
Exors. of late W. Franklin,* Portswood, Southampton	1,597	13	6

* Accepted.

OLDBURY.—For the construction of upwards of two miles of earthenware sewers, for the Oldbury Urban District Council. Mr. J. T. Eayrs, M.I.C.E., 39 Corporation Street, Birmingham, engineer :—

	£	s.	d.
Currall, Lewis & Martin, Icknield Park Road, Birmingham	3,940	9	4
A. Cooper, Rotten Park Road, Birmingham	3,762	7	11
W. Westwood, Bromyard	2,774	11	2
J. Mackay,* Hereford and Smethwick	2,627	6	5

* Accepted.

PRESTON, Lancs —For extension to police station buildings, Lancaster Road and Earl Street. Mr. Thomas Cookson, A.M.I.C.E., borough surveyor and engineer :—

	£	s.	d.		£	s.	d.
J. Christian	8,770	0	0	M. Shorrock	8 276	11	1
C. Walker	8,627	15	0	Topping Bros.	8,250	0	0
T. & R. Colley	8,487	15	0	T. Hill	8.167	14	0
W. Whiteside	8,452	4	2	W. Hothersall	8,163	0	0
T. B. Garnett	8,420	0	0	W. Bradshaw	8,162	11	1
J. Baines	8 391	10	7	J. Cartmell & Son	8,157	6	0
T. N. Livesey	8,325	0	0	T. Croft & Sons*	7,925	0	0
P. A. Baines	8.310	0	0				

* Recommended to Council for acceptance. [Surveyor's estimate, £8,300.]

SOUTHAMPTON —For alterations and additions at the Ordnance Survey Offices, Southampton, for the Commissioners of H.M. Works and Public Buildings :—

	£		£
H. Flint	8,267	Dyer & Son	7,178
J. Nichol	7,990	H. Stevens & Co.	7,166
Jenkins & Son	7,665	H. W. Bull	6,928
Golding & Ansell	7,600	E. C. Bull, Belvedere Works, Southampton	6,860
H. J. Hood	7,395		

SUTTON.—For erection of a cottage hospital at Sutton, Surrey. Mr. Cecil A. Sharp, 11 Old Queen Street, Queen Anne's Gate, architect :—

	£		£
Smith & Son	2.510	J. Humphry	2,270
Huntley Bros.	2,485	E. J. Burnand	2,132
F. J. Shopland	2,470	J. B. Potter,* Sutton	2,045

* Accepted.

Exclusive of additional items to be added at the option of the committee, which bring the amount of the lowest accepted tender to £2,500.

CURRENT PRICES.

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	2	2	1	12	1
Colza Oil, English	do.	1	5	6	—		
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	2	1	0	—		
Lead, white, ground, carbonate	do.	1	4	10	—		
Do. red	do.	1	0	4½	—		
Linseed Oil, barrels	do.	1	2	0	—		
Petroleum, American	per gal.	0	0	6¾	0	0	7
Do. Russian	do.	0	0	6¼	0	0	6½
Pitch	per barrel	0	7	6	—		
Shellac, orange	per cwt.	3	0	0	—		
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	4	6	1	5	0
Tar, Stockholm	per barrel	1	8	0	—		
Turpentine	per cwt.	1	7	9	—		

METALS.

Copper, sheet, strong	per ton	86	0	0	—		
Iron, Staffs., bar	do.	6	15	0	9	10	0
Do Galvanised Corrugated sheet	do.	11	0	0	11	10	0
Lead, pig, Spanish	do.	13	12	6	13	15	0
Do. do. English common brands	do.	14	7	6	—		
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0	—		
Do. pipe	do.	18	3	0	—		
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do., floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	15	0	7	0	0
Do. Mild Bars	do.	7	5	0	7	10	0
Tin, Foreign	do.	118	7	6	118	17	6
Do. English ingots	do.	123	0	0	—		
Zinc, sheets, Silesian	do.	21	0	0	—		
Do. do. Vieille Montaigne	do.	21	12	6	—		
Do. Spelter	do.	17	0	0	17	10	0

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Do. Pitch	do.	2	15	0	3	18	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	10
Deals, Archangel 2nd & 1st	per P. Std.	15	5	0	17	0	0
Do. do. 4th & 3rd	do.	11	15	0	13	5	0
Do. do. unsorted	do.	—			—		
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	15	0	15	5	0
Do. do. 2nd "	do.	8	15	0	14	15	0
Do. do. Unsorted "	do.	5	5	0	13	0	0
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	11	10	0	16	15	0
Do. White Sea	do.	10	0	0	14	15	0
Do. Quebec Pine, 1st	do.	22	0	0	23	0	0
Do. do. 2nd	per P. Std.	19	15	0	—		
Do. do. 3rd &c.	do.	13	10	0	—		
Do. Canadian Spruce, 1st	do.	12	5	0	12	15	0
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	7	15	0	10	10	0
Flooring Boards, 1in. prepared, 1st	per square	0	12	0	0	13	0
Do. 2nd	do.	0	9	3	—		
Do. 3rd &c.	do.	0	8	6	—		

HARD WOODS

Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba	per ft. sup.	0	0	4	—		
Do. Honduras	do.	0	0	3¾	—		
Do. Tobasco	do.	0	0	3¼	—		
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	4¾	—		
Do. African	do.	0	0	3¾	—		
Do. St. Domingo	do.	0	0	6⅜	—		
Do. Tobasco	do.	0	0	3¼	—		
Do. Cuba	do.	0	0	5 1/16	—		
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks	do.	8	5	0	13	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American	per cub. ft.	0	3	1	—		

CONTRACTS OPEN.

TO BUILDERS.

The Managing Committee of Governors of the St. Pancras Female Orphanage and Charity School will meet at the School House, No. 108 Hampstead Road, N.W., on SATURDAY, MARCH 30th, 1901, at THREE o'clock p.m. to receive and consider TENDERS for the ERECTION of a NEW ORPHANAGE on the existing site, pursuant to plans and specifications prepared by the Architects and Surveyors, H. H. BRIDGMAN, Esq., and SYDNEY G. GOSS, Esq.

Applications for the bills of quantities should be made to Mr. GOSS, No. 3 Broad Street Buildings, Liverpool Street, E.C., on or before MONDAY, the 18th inst.

Sealed and endorsed Tenders, with the names and descriptions of two sufficient sureties, to be sent to me at the Orphanage, on the said 30th MARCH, not later than THREE o'clock p.m.

The Committee do not bind themselves to accept the lowest or any Tender.

CHARLES WORRELL,
Honorary Secretary.

March 1901.

CITY of HULL.

TO BUILDERS AND OTHERS.

The Corporation are prepared to receive TENDERS for the BUILDINGS in connection with a Twelve Cell Refuse Destructor, to be erected in West Dock Street, Hull, including engine and boiler house, chimney 110ft. high, cottage, offices, and slope, but not furnaces.

Forms of Tender and other particulars may be obtained at the City Engineer's Office.

Tenders, endorsed "Tender for Destructor Buildings," are to be addressed to the Chairman of the Destructor sub-Committee, and delivered at the Town Clerk's Office before NOON on FRIDAY, the 29th MARCH, 1901.

The Corporation do not bind themselves to accept the lowest or any Tender.

By order,
A. E. WHITE,
City Engineer.

Town Hall, Hull,
March 1901.

THE BVILDERS' JOVRNAL & ARCHITECTVRAL RECORD

March 20, 1901.
No. CCCXIX.

Effingham House,
Arundel Street,
Strand, W.C.

IMPORTANT ANNOUNCEMENT.

We have to announce that the Builders' Journal *is to be raised in price from* 1d. *to* 2d. *There are reasons which fully warrant this alteration.*

The great increase in the circulation has created many additional demands involving a larger editorial expenditure.

Readers must have noticed how the section devoted to "Enquiries Answered" has grown, but probably they have not contemplated the large additional outlay which this implies. Instead of filling one column these enquiries (which need to be answered by technical experts) now occupy four, five, and sometimes six: moreover, the range of subjects upon which we are asked to give information is becoming more and more extended, entailing additions to the number of our staff and a corresponding increase in the expenditure.

We know that our readers place a high value on this section of the journal and it is our intention to develop it still further.

There will be no journal sold for twopence which will publish so much matter and so many illustrations as the Builders' Journal.

The Builders' Journal *will not only embody the chief characteristics of the original publication, which have made it so successful, but new features will be introduced which will make it still more indispensable both to architects and builders.*

Having thus briefly stated our position, it only remains for us to ask our numerous readers for their continued support.

The new series will commence with the issue for April 3rd next.

An Architectural Causerie.

Chapel of St. Peter-the-Martyr, Milan.

The Chapel of St. Peter-the-Martyr at Milan (the disputed work of Michelozzo Michelozzi, 1391-1472) is a brilliant jewel in the crown of the Italian Renaissance. It is a beautiful unity of architecture and decorative painting. Of noble aspect, it soars up in one of the most populous quarters of the Lombard metropolis and is the complement of a vast Gothic cathedral, St. Eustorgio, to which it is joined at the farthest extremity of the apse. Vincenzo Vecchio was the painter, and the building was finished in the year 1468. The tomb of St. Peter-the-Martyr, which is one of the most prominent features of the interior, is in white marble, supported by red marble from Verona, and is considered to be the *chef d'œuvre* of Giovanni Balduccio, a Tuscan artist of the fourteenth century. In this chapel there is no ornamental abundance, no sign of that abuse of richness which distinguishes the decorative architecture of Lombardian character, of which the front of the Certosa, near Pavia, and that of S. Maria dei Miracoli, at Brescia, are the chief examples. On the contrary we have the Tuscan soberness, which always gives a sense of strength. The ornamental painting triumphs in the cupola, the segments of which are painted with scales, which are red at the base, then yellow, then green, and lastly blue; the blending of these tints is such that the coloured bands one above the other combine in a decorative whole. The frescoes represent four scenes in the life of St. Peter-the-Martyr. The pictures of the entrance arch and those of the arch opposite represent the Annunciation and the Assumption of the Virgin. The tone of the colours is not strong, and harmonises with the delicate scheme of the whole chapel, with the deep green of the pilasters, the frieze—decked with rosy-tinted cherubs—and indeed with everything. The building claims the greatest interest from those who visit it for the purpose of study.

Bridges.

Engineers are not generally associated with æsthetics, and it was therefore a surprise to find a paper on "The Æsthetic Treatment of Bridge Structures" read before the Institution of Civil Engineers (a report of this paper is given on page 123 of this issue). It was, however, a pleasant surprise, and we hope it may mark the beginning of a new era. The first requirement of a bridge structure is to carry the weights which will be imposed on it, but there are also considerations of beauty, though these have received sparse treatment by engineers. It is a fallacy to think that fitness necessarily means elegance: for instance, a bridge may be perfectly suited to its task, and yet be ugly. But the great mistake which engineers have made is in the application of inappropriate ornament with the idea of beautifying their structures. It is needless to cite examples. Mr. Husband, the author of the paper in question, strongly objects to bridges being criticised from an architectural standpoint. We differ from him in this, holding the opinion that the construction of bridges is in many particulars—such as stability, proportion, ornamentation—similar to that of

ST. PETER-THE-MARTYR, MILAN: DETAIL OF DECORATION IN DOME.
MICHELOZZO MICHELOZZI, ARCHITECT. VINCENZO VECCHIO, PAINTER.

buildings, though we admit this has more special reference to masonry bridges than to those of iron and steel. Waterloo Bridge, for instance, is an architectural analogue to Somerset House. However, architects and engineers have much to learn from one another, and we hail with pleasure any indication of improvement. Considerable progress in this direction has already been made in France, where iron roofs and bridges are much more happy in treatment than our own.

Labor ipse Voluptas

ONE of the most extraordinary schemes for obtaining architectural designs is that formulated by a certain gentleman of High Holborn. This gentleman required "sketch designs for a country house" and made his intention known by advertisement. We have before us a copy of the particulars issued by him, which were given to us by an architect who applied for them. The drawings are to be sent in not later than April 22nd next "and marked 'plans' on the envelope, accompanied by a rough estimate of the probable cost." But the sentence to which we would direct special attention is the following: "Such of the sets of drawings as may be selected for any purpose will be retained, for which a sum of five guineas will be paid to the author in each case." We would advise this gentleman not to be reckless in his payments, not to squander like a wanton millionaire. Is it not munificent to pay five guineas for designing a country house, the approximate cost of which is "not to exceed £6,000"? Five per cent. on £6,000 is £300, and we are wondering whether any architect has been fool enough to send in designs on the terms mentioned. "Such of the sets of drawings as may be selected *for any purpose*"—what does this mean? We draw our own conclusions. Such practices as this deserve strong condemnation, and we are only glad that they so seldom occur. When they do, however, they should not be passed unnoticed.

SELJUKIAN GATEWAY, AMASIA.

THE HITTITE CITIES OF EYUK AND BOGHAZ KEOY.*

BY THE REV. G. E. WHITE, MARSOVAN, TURKEY.

FINE spring weather and fine Turkish courtesy from officials, local boys and villagers supplied the outward conveniences for the interesting visit to the cities named above, made by three young Americans of the Marsovan missionary circle in March, 1898. The first night was spent at Chorum, near the junction of the three ancient provinces of Pontus, Galatia and Cappadocia, and the first chapter of First Peter furnished suitable devotional reading that evening.

The next day, an hour before reaching Eyuk, we came to Kalch Hissar, Castle Wall, a double peak rising 500ft. to 600ft. above the plain, with a village of Circassian refugees from Russia at its foot. The peak has some of the crumbling masonry so common in Turkey, but at the summit we found something different. On the topmost of four steps, cut in the rock, once sat an idol or a human figure of nearly life size, the feet resting on the third step and cut from the same stone that formed the step. The feet are broken off at the ankles now, and the rest of the figure is gone. The toes of the shoes are round, not sharp-pointed or upturned according to the usual Hittite custom; but the Hittites did not carve all their shoes with sharp upturned points, and the conclusion seems natural that Kalch Hissar also was a Hittite shrine in the time of the Old Testament.

Eyuk, meaning in Turkish "mound," is built upon a low level mound, in which the villagers say strange stones are sometimes found when they dig for the foundations of dwellings. At one corner of the town the stones remain exposed that once formed a temple, wonderful not for its size or beauty, but for its age and the peculiar character of the Hittite sculpture. Of the building itself nothing worthy is left save the outline of a room about 25ft. by 30ft. square. But the entrance is still guarded by two huge basalt stones about 12ft. high, the face of each of which is carved into the form of a sphinx, with fillet across the forehead, earrings, necklace, and wing-like attachments from the head to the sides of the body. The resemblance is striking to the pictures that come from Egypt. On the inner side of the sphinx, at the right as one enters the temple, is a double-headed eagle with a hare in either talon and a human figure above (almost or quite life-size) supported by a foot resting on the double head of the eagle. On the left was a similar carving, now almost effaced.

The entrance is approached by a double line of huge basalt stones forming a dromos, which presently turns a sharp angle to the right and left. Two processions approaching the temple are represented on these walls. They are a series of human figures cut in bas-relief on the face of the stones, about 3ft. high. They are mostly clad in tunics reaching to the knees with sometimes a loose cloak, draped from the shoulders to the feet, and a skull-cap with horn in front, reminding one of the Egyptian uraeus; shoes are turned up at the point, and the figures have large noses and large earrings. One figure has either a long tassel on a close-fitting cap, or hair depending in a closely-tied queue; either supposition favours a Mongol origin for the Hittites, for the first resembles the custom of the Turks, the second that of Chinamen. Such customs of dressing the hair or covering the head are very persistent in the Orient.

In one case a priest seems to be ministering before an altar, while another priest is dragging a ram by the horn, with three more rams in the field behind and above; another pours a libation upon the feet of a seated goddess. One figure is playing a guitar, another blowing a horn, several have each a lituus, a musical instrument, depending from the hand; a man climbs a ladder half higher than himself and consisting of seventeen rungs. One of the great stone blocks exhibits six similar figures marching; two have bulls, one with something on his back, perhaps an altar; and there are two lions on blocks that have been displaced from the series (the lion is the most characteristic animal of Hittite sculpture). The whole scene clearly seems to be religious, not political or military, and is attributed by Professor Sayce to the thirteenth century before Christ.

PORTION OF OLD SCULPTURE BY THE CASTLE WALL, ZILLE.

Eyuk and Boghaz Keoy are five hours apart, and the latter was evidently a great capital. It is suggested that it was the cool summer abode of the "kings of the Hittites," who were natives of this region, but lived in Syria or elsewhere in winter. The space, enclosed by a wall, is over a mile long by a half mile broad, and contains remnants of three castles and three palaces.. The distance from the top of the wall to what was the bottom of the moat in places exceeds 150ft. in a straight line. These walls were built without mortar, the great rampart of earth being topped by a double-faced wall of large cut stones, the space between being packed with rubble. The outer upper edge of each cut stone has a little turned-up ledge, which prevents the stone laid upon it from slipping outward, while its fellows on either side and the rubble behind would keep it from moving in those directions. The outer slope of the walls is in some places paved with flat stones, which both held the earth and would place invaders at the mercy of defenders. The principal palace was of the form of an Oriental inn, with a series of rooms aroud a large central court. Near by is an overturned chair or throne mounted upon and between lions.

Boghaz Keoy has but one inscription, Nishan Tash, a lettered stone 6ft. by 18ft. in size, but, sad to say, this is defaced beyond decipherment. We were fortunate, however, in securing some fragments of cuneiform tablets and seals, probably Hittite or Mycenean. One of these last had a figure 4 in the centre, surrounded by rope-work, and with a loop at the back for passing a cord through. We found also a whorl of the sort discovered in such numbers by Dr. Schliemann at Troy.

One of the spots which we considered to be

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* A paper read before the Victoria Institute, London, on March 4th, 1901. [We are enabled to publish the accompanying illustrations through the courtesy of the author.]

TOMB UNDER THE CASTLE WALL, ZILLE.

most interesting is an abrupt rock called "School Rock," two slopes of which have been hewn into the shape of bowling floors. The larger, about 18ft. by 30ft., and as nearly semicircular as the configuration of the rock permits, forms quite an auditorium. The rock faces are cut down 8ft., and decorated with striated lines, and the floor is a series of low broad tiers or stairs. At the focal point the rock has been drilled with several holes, where the platform for players or the bench of a judge might easily have been erected. The whole is a rough but distinct form of a theatre, and the query at once arose, Have we not here a copy of the original of that famous structure, the Greek theatre? If the Hittites of Cappadocia could make sphinxes like those of Egypt, correspond in cuneiform characters with the people of Mesopotamia, and amuse themselves with playthings of a kind more abundantly used at Troy, how natural for them to pass on to the Greeks anything of their own worth while copying, for the Greeks to improve upon. Here is a small rough assembly hall within the walls of a capital and near the throne. Why not a model to the Greeks? The suggestion is made for what it may be worth.

The most important sculptures at Boghaz Keoy are those of Yazili Kaya, two miles from the ancient town. Here again the design is devotional, not military. The larger of two rock galleries contains on its sides a double procession meeting in the middle. The figures are like those of Eyuk, but more in number and of greater variety. The skull-cap gives place to high and flat-topped or high and conical caps, the peak sometimes drawn forward in the "Phrygian" style. Lions, tigers and double-headed eagles support various human forms. Others stand on mountain summits, or on the heads of men. At the head of the two processions, which contain more than threescore figures, a priest and a priestess of gigantic size meet each other with peculiar symbols in their hands. Would that the key to all this were known to us; that we understood what were the thoughts in the minds of the men who carved these images in the rocks long before the time of our Lord! The Hittites faded from history 700 B.C.

The smaller of the Yazili Kaya rock galleries contains other figures like those in the larger gallery. One is an interesting series of twelve men who seem to be reapers, each with his sickle over his shoulder; but they may be soldiers marching with swords. Many places in the region were described to us by the villagers as having "idols and writings" or "lions and dogs," &c., some that we were able to examine yielding nothing interesting. Rock-hewn tombs with Doric columns and a spiral stairway cut through solid rock down to a river, but with no trace of a castle above, aroused our curiosity.

One place, however, the village of Eski Yapar, one hour west of Alaja, deserves special mention. It is built, like Eyuk, on a flat mound in an open plain, and furnishes peculiar stones to the inhabitants when they dig. Apparently the debris of an Oriental village occupied for generations had lifted up the very site of the place above the plain to the height of a man. Here we found several Greek inscriptions on stones used as tombstones, perhaps a thousand years ago. A round column inverted and half-buried proved to be a Roman milestone with the name Cæsar plainly discernible on it. Apparently it was a milestone of Antoninus Pius, well-nigh two thousand years ago, set up to guide travellers on roads long since forgotten. A villager invited us to look at a queer stone built into the corner of his house, and there we found cut in red sandstone rock another figure of a lion. This one had lost its head, and being set up on its tail occupied an awkward and uncomfortable position for so noble an animal and so valuable an archæological specimen. For what can it be but another Hittite lion made and left more than three thousand years ago?

That little village of Redhead, *i.e.* "Shiite," with its relics of three other peoples with their mighty governments, their races, languages, religions, customs and civilisations distinct one from another, and a thousand years apart, and with Doric and Ionic capitals in the near vicinity, is an example of what is waiting for the spade of the explorer and the genius of the archæologist in the soil of Asia Minor.

[On the moment of going to press we have received from Mr. White a most interesting photograph and some particulars of the palace and "theatre" of the Hittites at Boghaz Keoy. These will be published in our next issue.—Ed. B. J.]

OLD GREEK THEATRE UNDER THE CASTLE WALL, ZILLE.

ARCHITECTURAL ASSOCIATION.

ROWTON HOUSES.

By H. B. Measures.

A MEETING of the Architectural Association was held last Friday evening, Mr. W. H. Seth-Smith, president, being in the chair. The minutes of the previous two meetings having been read and confirmed, Messrs. R. H. Murray and C. R. Pinsent were elected members. Mr. H. B. Measures then read his paper, of which the following is a summary:—

Time will not permit of a detailed description of each Rowton House: I therefore propose to describe the house at Newington Butts, containing as it does practically all the essential features of a building of this description and, moreover, because the site is one which both in frontage, depth, and general disposition, is as near as possible an ideal site for the purpose of providing accommodation for 800 men. It is situated in a very crowded neighbourhood, frequented by the class of men who have in the past had to crowd into small houses as the lodger, or go to a common lodging-house, with all its degrading surroundings. For the workman the position is one affording exceptional facilities for access to the heart of London, consequent upon the proximity of railways, including the South London, and the tram and 'bus routes in all directions.

The site has a frontage of 214ft. overlooking a well-laid-out public recreation-ground, the site of the disused churchyard of St. Mary Newington, and is approached by a wide footway from Newington Butts. The depth of the site from front to back is an average of 138ft.

The building is set back from the forecourt railing a distance of 10ft., and as the ground floor is 4ft. above the paving ample light is obtained for that portion of basement which is on the front of the building; at the back the main building is set back a distance of 25ft. from the boundary. This gives a considerable space for light and air whatever the adjoining owners may hereafter do on their land, and, in addition, the dimension just enables the building to be erected without coming within the Building Act angle of 63½ deg.

The central courtyard above ground floor has a width of 58ft. 6in., which is wider than I have been able to obtain at either Calthorpe Street or Whitechapel, the latter being 49ft. 6in. wide; this, I consider, gives ample width, but is not so convenient for planning the ground-floor rooms as a width of, say, 60ft. In all the plans, the plan of cubicle floor is based upon

THE MIRROR TOMB, NEAR AMASIA.

an elongated letter U ; this I consider to be the most satisfactory form for planning, and preferable to an enclosed quadrangle; with the latter it may be possible to produce a large central staircase, but I do not advocate such in preference to those adopted. The shape adopted gives an abundance of light, sunlight, and fresh air into the courtyards, and lends itself to the disposition of staircases at the extremity of each arm. I need hardly point out that with the staircases thus planned it is impossible for a man to be trapped in the event of fire, a thing that is likely to happen with a central staircase unless panic stairs are provided—these are expensive and would probably be overlooked in case of need.

The elevations are built in pressed Leicester bricks and mingled gaults, and the dressings in pinky buff terra-cotta. The whole of the interior walling is built with gault bricks, excepting where glazed brickwork is used. The brickwork throughout the building is in Portland cement. The floors are breeze with steel joists, the breeze covering the underside of joists 2½in., the top screeded over joists for flooring. The front roof is constructed of breeze slabs 4in. thick, with angle iron therein, and the slating nailed direct on to the slabs; all other roofs are flat, of breeze and steel construction, covered with asphalt.

For administrative purposes the house is divided into five sections as follows:—(1) Lodgers' day-rooms; (2) Lodgers' cubicles; (3) Catering section, which includes sleeping accommodation for females employed in shop, kitchen, and scullery; (4) Bed-makers; (5) Superintendent's apartments, with separate accommodation for the office clerk.

For the purposes of this paper I will assume that you are accompanying me upon a tour of inspection, following very much the course that a lodger would take. On entering the building an office is provided in the vestibule, where the lodger makes application for a bed-ticket, for which he is charged 6d.; this frees him to the use of all the day-rooms of the house and separate sleeping accommodation for one night. If he desires to do so, an opportunity is allowed him of renewing his bed ticket up to 9 o'clock at night, before which hour no new lodgers are booked, or he may take a bed for a week by payment of 3s. 6d. A lodger can renew his cubicle from day to day, or by the week, so that he has the exclusive use of it. The office front and its fittings are in polished teak, and a safe is provided for the custody of any valuables or money given in charge of the clerk. Opposite the office - window turnstiles are fixed; these serve as a "moral barrier," it being impossible to use them for checking purposes, as the lodgers are in and out of the buildings at all times. The space beyond the vestibule is a provision not only to give room where there is much traffic, but, in addition, to give sitting accommodation in what is a favourite place with the lodgers to watch the arrivals. These spaces and the corridors leading from them past all the day-rooms to the two cubicle and basement staircases have glazed brick walls from floor to ceiling, with a dado in chocolate and cream-coloured bricks and ivory above. The floor is of cement and granite chippings. Water for drinking is laid on

The dining-room has a floor space of 5,300ft., and seating accommodation is provided for 440 men at tables; a number of extra seats and wooden easy chairs are placed in the room. The walls have a glazed brick dado in chocolate and cream, 4ft. 9in. high, with plastering above distempered to tint. The floor is of oak blocks laid herringbone. The tables and seats are of teak, carried on cast-iron standards, the length being 7ft., giving provision for eight at each table. Four large cooking ranges, with ovens, hot plates, and grills are provided. These are placed out of the line of traffic, and are built into glazed-brick chimney breasts from floor to ceiling; this is necessary, as plaster work becomes discoloured in a very short period.

The portion of dining-room between the front and back wings is, in addition to windows, top-lighted and ventilated by four lantern lights, the whole of the sidelights in which open for ventilation; in addition, all the windows are hinge-hung to fall in above transoms, and casement-hung below, the latter being secured by a latch and usually only opened for cleaning purposes; ventilation flues are also provided in walls.

A lodger may purchase cooked or uncooked food at the shop, or he is at liberty to bring his own purchases from outside and have the free use of the ranges, cooking utensils, and lodgers' scullery for the preparation of such food.

The crockery and service room between the dining and smoking rooms is built in glazed brickwork from floor to ceiling and fitted up with shelving. This is provided for those who cook their own food, and is furnished with pots, frying-pans, teapots, plates, cups and saucers, which are at the lodger's service, and which he leaves where used by him, to be collected by porters, who send them down a lift to the basement scullery.

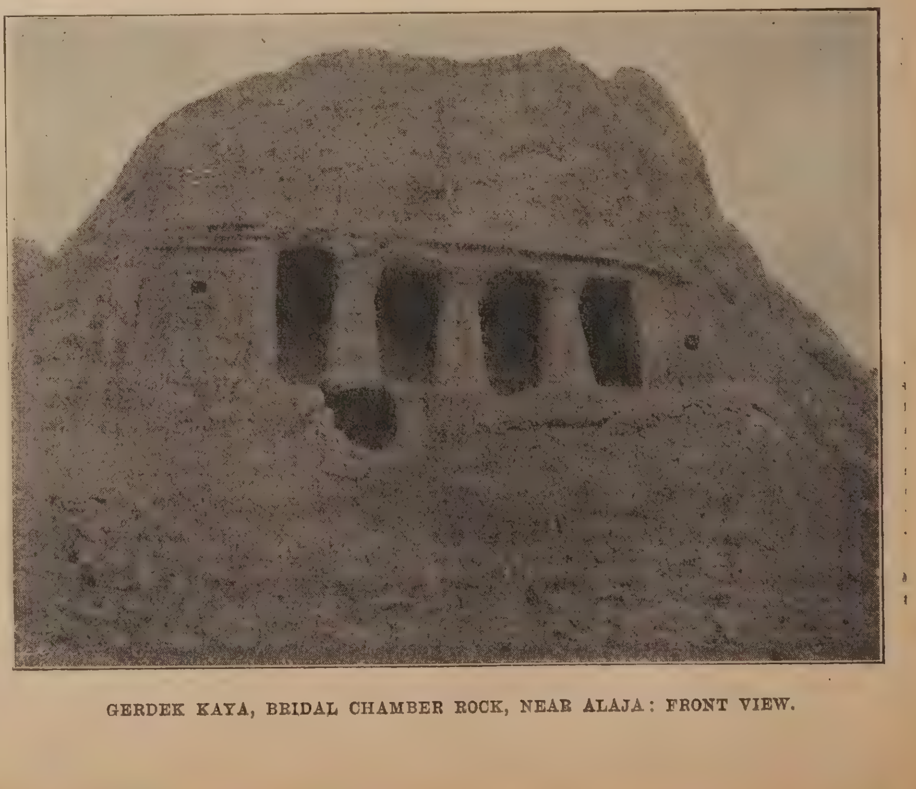
The shop has a teak front with sliding sashes, and is fitted up with counters in teak, hot plates, urns and drawers and shelving for the varied assortment of articles sold. A tobacco licence is held. The prices charged are practically what would be paid outside at a coffee-house. A lift delivers into a service lobby outside kitchen and also into the scullery on basement, and a staircase gives access to same.

The smoking-room is approached from the corridor and from the dining-room. The floor space is 1,600ft., and is fitted up and finished in a manner corresponding with the dining-room; the seating at tables is for 112, with an additional seating accommodation in wooden easy chairs. The chimneypieces are in glazed faïence, and large open fires are maintained. Although this room is called the smoking-room, smoking is allowed in any portion of the building used by lodgers during the day.

At the back of the building is the reading-room. This is an L-shaped room with an area of 2,550ft.; the walls have a glazed-brick dado with plastering above as in the dining-room; the chimneypiece is in glazed faïence. Seats at tables provide for about 170 men, and a large number of easy chairs are provided around the fireplaces. In all these rooms the doors are set into a recessed lobby; this allows them to open outwards without projecting into the corridor, and, in addition, it is possible for the superintendent to obtain a view of the room while standing in this lobby to see that order is maintained. Books are lent to lodgers on application to the superintendent. Games, such as draughts, dominoes, &c., are placed in the room. Cards are not allowed.

Adjoining the dining-room are the locker corridors. The position assigned to these is the most convenient where planning will permit, as they are used for storage of food to a great extent. In the house under notice they are 1ft. 6in. cube, with a shelf dividing into two parts. Of these lockers there is a provision of 800; they are arranged in tiers four in height, and each locker is ventilated and numbered and has a separate key. Above these lockers a number of larger lockers of double the cubic capacity are provided for those who require additional space. Provision is made in them for a stick or umbrella, and a shelf similar to the smaller lockers. The charge for a small locker or a large is 6d. and 1s. respectively, and upon the return of the key 5d. and 10d. respectively is returned, which to a regular lodger is to all intents a charge of 1d. or 2d. for a year or more. In the locker corridors small tables are placed against the piers for brushing or sorting articles in lockers. The corridors are lighted and ventilated at ends by windows, in addition to top lighting and ventilation.

The water-closets and urinals for day use are placed at the rear of the building, and are disconnected from it by a ventilated lobby. The walls, partition walls, and divisions to urinals are all of ivory-glazed brickwork. The roof over is in lantern form, glazed from end to end in T-iron bars, with vertical pivoted louvres.



GERDEK KAYA, BRIDAL CHAMBER ROCK, NEAR ALAJA: FRONT VIEW.

There are 41 water-closets, being a provision of one for every 20 men. The division and front walls are 6ft. 3in. high with a moulded capping and open above; each water-closet is fitted with a flushing cistern, having an iron supply-pipe to pan. The pan and trap used are of the short hopper type, or glazed brick "soap size" is used for risers, and the whole of the space inside same, around pan and trap, up to the top of pan, is filled in solid with cement concrete. This is found to be a perfectly effective means of avoiding breakages, wilful or otherwise. The seats are teak, bedded and screwed down on to the concrete. The doors are kept up 3in. above the floor for ventilation. The door stops and the hinges are slightly out of the perpendicular, the effect of which arrangement is that, excepting when the door is bolted, it automatically opens back on to the division wall, and by that means a lodger is always able to find which water-closets are unoccupied. The door frames are dowelled down to 3in. cement base blocks. The floor of water-closets is laid with a fall towards door, and constructed in concrete with granite chippings. Adjoining these water-closets, near the foot of the main staircase, a room is provided for fumigating bedding or other articles.

At the extreme end of back corridor a staircase is constructed, giving access to the roof over the portion of ground-floor rooms within the centre courtyard; this roof is at first-floor level and is paved with asphalt, fenced in and provided with seats as an open-air lounge and smoking space; it appears to be a much appreciated feature.

Basement.

The two main staircases are continued down at the end of the ground-floor corridors to the basement; a corridor leads from each into the lavatory. In passing I might say that the whole of the basement, where used by the lodgers, is built in glazed brickwork from floor to ceiling, and all the floors are cement concrete finished in cement and granite chippings.

The lavatory has a dado in French grey and ivory, with ivory above. There are eighty basins, fitted with hot and cold water supply, the construction being as follows:—Each set of ten is carried on three divisional walls with angle-iron bearers to carry slate top; the basins are white enamelled fireclay, with outer rim bearing on iron bar on edge, bearers shaped to basin and bolted to outer angle irons. Immediately under the slate top two horizontal water pipes, hot and cold, are carried from rising mains, on main walls, through to end division, with a plug for clearing in the event of a stoppage; branches rise vertically to gun-metal screw-down cocks. Iron waste-pipes are used, discharging over channel in floor; for basins, loose-turned wood plugs are used. The floor is laid with falls to the channels under these lavatories. Towel rails are fitted at ends of ranges and on walls with round towels supplied thereto. Central over each range of basins and running longitudinally a hat and coat rail is fixed.

A portion of the lavatory is screened off by a glazed screen and fitted up with white glazed fireclay feet-washing baths, with teak draining boards between each. Hot and cold water is carried to each, and the wastes discharge over a channel similar to the lavatories. Towels are provided. In the front corridor leading from lavatory to the foot of main staircase there are bath and dressing rooms; the walls are divisional walls 6ft. 6in. high, in glazed work, and the baths are of white glazed fireclay, with a riser of glazed brickwork and finished with a teak top. Baths uncased were tried in the first house, but the space around them, next to the walls, too often proved a receptacle for discarded underwear. Hot and cold water is laid on to each bath. A lodger pays 1d. for a bath ticket, which includes soap and towel; the water is turned into the bath by the attendant. A chair completes the furnishing of bathrooms.

The dressing-rooms are to all intents and purposes as bathrooms, minus the bath. As no lodger is allowed in his cubicle during the daytime, it was considered and found to be necessary to provide accommodation to enable him to change his garments.

In the corridor connecting front and back staircase is a room described as "the lodgers' washhouse," where many wash the whole of their wardrobe of underwear. In the same corridor, adjoining the lodgers' washhouse, is the porter's day room, fitted with lockers, tables, and easy chairs for the officials' use during their leisure and at meal times. On the opposite side of corridor two rooms are allotted to a repairing shoemaker and a tailor, who find constant employment from the lodgers. Returning to the main back corridor there is a space between porter's room and lavatory; this is used as a boot-cleaning and clothes-brushing space, tables and foot-rests being placed therein. A lodger with tools, boxes, or other belongings too large for lockers can, by payment of a small fee, store them in a parcel-room and have access, in company with an official, from time to time. A shop is provided for a barber, who is in constant employment. The knife-cleaning room and the fitter's room adjoin, the latter being fitted with vice, &c., for minor repairs.

In the furnace-room two boilers supply the whole of the hot water used by lodgers for lavatories, baths, &c.; these are connected to two cylinders, each of 250 gallons' capacity, placed in linen and blanket store. A drying-room, fitted with galvanised-iron framework, is built upon the setting of boilers, and utilises waste heat for drying purposes. In the passage outside, at the left end of the buildings, all ashes and refuse from day-rooms is placed in sanitary pails for removal by the authorities by the steps in area. All area walls and voids are in glazed brickwork.

GERDEK KAYA, BRIDAL CHAMBER ROCK, NEAR ALAJA: SIDE VIEW.

Cubicle Floors.

From the ground floor of the building two main staircases give access to the cubicle floors and are carried up the full height of building, with steps of a uniform width of 4ft. 6in. to the flat roofs at top where a gangway is railed in from one staircase to the other, enabling lodgers in case of fire to ascend one staircase and descend by the other. The staircase is built in ivory-glazed brickwork the full height, and the steps are formed of Portland cement with two angle-irons in each; the balusters and handrail are of wrought-iron. On each landing, approached by a door off it, is a sink space with hot-water supply for cleaning purposes, and cold for drinking, carried to a glazed fireclay sink. On each side of the sink space a water-closet is formed for night use only.

Taking the cubicle floor as a general scheme it consists of a central corridor 4ft. wide, extending around the U-shaped building from staircase to staircase. It is divided by partition walls into sections, varying (according to convenience in planning) of from twelve to sixteen cubicles in each. Where possible, I endeavour to plan in sections of sixteen, for a reason which I will explain when dealing with lighting. Among other reasons for the subdivision of cubicle floors into sections are the checking and possible isolation of an outbreak of fire; another advantage is that, in a case of infectious or contagious disease, the isolation and efficient disinfection can be arranged without closing the whole of one floor of cubicles. Swing doors between each section conduce to quietness between each section; fanlights over these open for ventilation. The flooring is yellow, nailed direct upon the screeded breeze floor. The special staircase admits of the women bedmakers obtaining access to the various floors without passing through any of the lodgers' day-rooms. On each floor, including one on each staircase, there are five fitted fire-hose boxes, with glass panel in door for access to bolt.

A typical section of cubicles is planned eight on each side of corridor, handed right and left from the centre of section. This method of handing from the centre is one that I consider most essential; it enables each bed to be against a cubicle partition on the other side of which is the passage space of the next cubicle, and not the bed; any reversal of this arrangement means that sleeping next to a restless or noisy sleeper would be a most unpleasant experience. Every cubicle in the building has its own window opposite the door, leaving a pier against the head of sleeper; those who have had the misfortune to sleep with the head immediately under the chilled atmosphere at a window will realise that this is not a small point in planning. The windows all have a high bottom-bead permitting the raising of sash for ventilation at meeting rails, and the sashes are double hung and of a uniform width of 1ft. 6in. in the brickwork, carried up to within a few inches of ceiling. The framing for cubible partitions is 3in. chamfered frames filled in with 1⅛ V-jointed and tongued boarding painted to a cream shade and twice varnished. The cross partitions are 7ft. 6in. high, and the partition next corridor 6ft. 6in. high; the height of cubicle floors from floor to ceiling is 9ft. The door of cubicle is kept up 2in. above floor for ventilation, and has a bow handle outside and bolt inside. At the foot of bed three hat and clothes hooks are fixed with a shelf projecting over and covering them, making it impossible for garments to be lifted off hooks over the partitions at night by other lodgers (a necessary safeguard). The cubicles are, excepting where breaks on elevations increase their length, uniform in size throughout the building, the minimum standard of 5ft. wide by 7ft. 6in. being adopted; the beds are 6ft. 3in. by 2ft. 6in. over all, the space at the end next corridor permitting the drawing out of the bed for making and the hanging of clothes on pegs; the minimum floor space of each cubicle is, therefore, 37ft. 6in., and the cube air space taking half the corridor for each cubicle is a minimum of 427ft. 6in. To provide for ventilation independent of the windows in cubicles, which the occupants may keep closed, windows are planned at the end of corridors, and these, the fanlights over swing-doors, and the staircase windows, enable the officials to let a current of fresh air through the various sections. On the top floor of building, at the back of sloping roof, is a row of cubicles. These are on one side of the corridor only (excepting in gables, where they are on both), and the dormers on front are a provision for cross ventilation. On each floor two rooms are reserved for officials, who sleep there and are responsible for order. They are fitted as small bed-rooms, and the space from top of partitions to ceiling is glazed for privacy. The staircases are lighted by a point on transom of door leading to sink space. This gives in addition sufficient light into sink space and water-closets through glazing of fanlights and doors. In a section of sixteen cubicles two gas points are sufficient for lighting. Each is set opposite the second cubicle partition from door, and thus lights four on each side. There is not sufficient light for reading in bed, but ample for undressing.

The gas points on staircases and at points in ground-floor corridors are alight all night, and in addition at the change of direction in corridors on cubicle floors a point is also alight all night that a lodger may be able to find his way out at any time. The other gas points are controlled from the office when necessary.

The furniture of a cubicle consists of an iron bedstead, spring mattress, a mattress cover, a horsehair mattress and pillow, two twill sheets, a blanket under same, and any reasonable number over, with a quilt, a wooden chair, and a chamber utensil.

A lodger can go to bed at any time after seven o'clock by presenting his ticket to an official at the foot of one of the staircases. One staircase only is generally used, and found sufficient. He then finds on each floor direction-boards giving the number of cubicles on that floor. Wrought-iron gates bar access to the cubicles during the day, and at night, except by passing an official, these gates are secured by a weak chain and padlock, which the weight of one man will easily break. It is found to answer its purpose as a moral barrier, and its weakness removes possible danger in case of fire. No lodger is allowed to remain in a cubicle after nine o'clock in the morning, at which hour the bedmakers take possession of the various floors.

Catering Department.

The whole of this department is placed in the basement and is accessible only by way of the tradesmen's entrance by passing through the office lobby, or from the Superintendent's private residence. The kitchen is built in glazed work from floor to ceiling, and has a wood block floor, excepting where cooking apparatus is fixed, where red adamantine tiling is laid. Adjoining is the scullery, built in glazed work, with cement floor, fitted with large white glazed fireclay and teak sinks with draining-boards and a large range of plate-racks. A lift from here opens into the lodgers' crockery store above and another into the shop. The larder, the walls of which are tiled, is disconnected from the kitchen by a service passage (in which is placed the lift for kitchen and larder service to shop). A staircase from shop, constructed in teak, gives access to service lobby and also to the corridor to stores and female staff-rooms. There are stores for spare crockery, groceries and provisions, and linen and blankets. Kitchen coals, meter-room and water-closet for catering staff are provided. The staff sleeps on the premises, under the reading-room, and has a sitting-room and five bedrooms; the walls of these are plastered, papered and furnished with pictures, and the floors are wood block. A private door at basement level enables the Superintendent's wife to obtain access for supervision.

Bedmakers.

The bedmakers are not resident upon the premises; they enter the building by a door at the side of the office and descend to their room in the basement by a staircase in full view of office: this staircase is carried up to the first floor of cubicles. A room known as the bedmakers'-room is provided at the foot of stairs, fitted with tables and chairs and a small range for preparation of other meals. Adjoining this room is a cloakroom, fitted with sink and a water-closet opening out of it. A door gives access to the soiled-linen room, which is built in glazed brickwork from floor to ceiling and has a cement floor. The lift delivers from all cubicle floors into here, and the dirty linen is checked into baskets and taken direct away to laundry.

I will now describe in a general manner the three other houses, taking them in their order of erection.

King's Cross House

is erected upon a site which presented a good many problems in planning. There is a frontage of 200ft. to Calthorpe Street and 125ft. to King's Cross Road, with a superficial area of 17,180ft. Generally the construction and materials throughout are as at Newington. The house has cubicles for 677 lodgers. The smoking-room has eating accommodation at tables for 128 men; the floor area is 1,600ft. The crockery store is somewhat small, and more provision is made in other houses. The dining-room has seating accommodation at tables for 376 men, the floor area is 4,000ft. The reading-room has seating accommodation for 112 men at tables; the floor area is 1,528ft. The lavatory in the basement has eighty basins: this is rather excessive, and in the other houses that number is found to be sufficient for 800 men. A basis of one basin for ten men is ample. Water-closets are provided for day use in proportion of 1 in 20; there are too many urinals. In general planning, sizes, and construction the cubicles are as Newington, with the exception that the staircases are not quite so ample, and but one water-closet for night use is placed on each of the various floors.

The Building at Hammersmith

is erected upon a site within 200yds. of Hammersmith Broadway. The site consists of two parallelograms, the smaller of which forms the frontage to Hammersmith Road, the frontage to which is 65ft. by a depth of 102ft. to its junction with the larger, which has a width of 160ft. by a greatest depth of 276ft.; the total superficial area is 44,000ft. The space was sufficient to permit the erection of a building upon the back portion, reserving large areas for light and air, while utilising a portion of the frontage for business premises with a reserved entrance to Rowton House. Materials and construction, excepting in a few minor details, are as at Newington. The smoking-room has seating accommodation for 164 men at tables; the floor area is 2,428ft. The dining-room has seating accommodation for 464 men at tables, the floor area being 5,722ft., and the reading-room for 176 men with a floor area of 3,128ft. The table accommodation in these rooms provides a seat for every lodger, exclusive of easy and other chairs. The lockers here are all 3ft. 1in. high by 1ft. 6in. square, with shelf and space for umbrella: they are placed three in height, and may be taken as a new standard of size.

In consequence of the length of site it was found possible to throw out an arm from the usual U shape towards the north with sufficient lighting, east and west, for the cubicles. This gave such increased accommodation on each floor that the building was built to a height one storey lower than Newington or King's Cross, and still provides accommodation for 800 men.

Whitechapel Building,

the latest of the Rowton Houses, is in course of erection in Fieldgate Street, which runs parallel with Whitechapel Road, and is immediately behind the St. Mary, Whitechapel, Station. It has a frontage to Fieldgate Street of 192ft., and a back frontage of 259ft., by a depth from front to back of 128ft., giving a total area of 29,589ft. For cubicle planning the site is good, and permits of the omission of one storey as compared with Newington, yet gives an accommodation of over 800 beds.

The entrance planning is as in other houses with these differences—the clerk has his bedroom approached from the office by a staircase over the entrance; the superintendent's residence is two storeys in height, and underneath his lower storey a third storey is obtained by lowering the floor (in the height of two storeys of main building) and forming a basement containing bedmakers'-room and porters'-room approached by separate staircases: the bedmakers' by the wooden staircase at end of entrance, and the porters' by a staircase from lower ground floor level under the staircase to reading-room; parcel-room adjoins porter's-room.

The dining-room is chiefly top-lighted, and seats 464 men at tables; the floor area is 5,832ft. The smoking-room accommodates at tables 112 men and has an area of 1,960ft. The lockers are of the size mentioned for the Hammersmith House, and provision is made for one for each lodger. The reading-room seats at tables 144 men, in addition to easy chairs, &c., and has an area of 2,430ft.

A discussion followed in which Messrs. Seth-Smith, Thomas Blashill, A. T. Bolton, C. H. Brodie and H. V. Lanchester took part, and in reply to a vote of thanks Mr. Measures said the reason they got such good work at a low price was that the Rowton House Company were their own builders, and thus there was no inducement to scamp work. There was no system of ventilation in the houses further than the windows and a few flues, which were found ample.

THE NEW CATHEDRAL AT WESTMINSTER.

THE new Roman Catholic Cathedral of Westminster is rapidly approaching completion. It is just off Victoria Street, near Victoria Station. The building is in the Byzantine style, the campanile tower being 273ft. high and the top of the cross 283ft. For nineteen years Cardinal Manning strenuously endeavoured to obtain a site, and when it had been gained it remained for ten years unoccupied. At length, in 1894, Cardinal Vaughan determined to make a beginning. The project was privately submitted to a number of persons, who generously responded, and the first stone was laid on June 26th, 1895. The foundations, which rest on concrete from 4ft. to 10ft. thick, were completed in September of the following year, and now the structural work is so far advanced as to yield some hope that the building may be opened in July of the present year. The work of internal decoration will, no doubt, extend over many years. The building is designed by Mr. John Francis Bentley. It consists of a fine nave, 117ft. high and 60ft. wide, and two aisles with transepts, a baptistery, and eight side chapels. It has a sanctuary 4½ft. above the level of the nave, with the Lady Chapel on one side, and on the other a spacious Chapel of the Blessed Sacrament, behind which are two sacristies and rooms therewith connected. Internally, beside the massive lofty piers, rise twenty-eight marble columns, beside many other columns of granite and marble in various parts of the building. When sufficient money is forthcoming the lower walls and piers, to the height of 38ft., will be covered with marble, and the whole upper part of the piers and walls, and the concrete domes and vaults, will be decorated with mosaic work illustrating the history of the Roman Catholic Church. The nave is higher and wider than any nave in England. An uninterrupted view is given of its great length of 342ft. As to cost, the sum of £134,666 has been paid to contractors, architect, and clerks of works up to December 1st last.

Messrs. Vickers, Sons and Maxim are about to build 200 houses on Walney Island for the accommodation of their Barrow-in-Furness workmen, and it is stated that the firm also contemplate the erection of new works on the island opposite their present shipbuilding yard. The firm already employ nearly 10,000 men at Barrow.

Law Cases.

Compensation for Trade Disturbance.—After a three days' hearing, Mr. John Troutbeck, High Bailiff for Westminster, and a special jury, concluded at the Surveyors' Institution last Thursday the case in which Messrs. Halsey and Davison, cardboard manufacturers, sued the St. James's and Pall Mall Electric Lighting Company for compensation for trade disturbance, the defendants having acquired their premises in Marshall Street, Soho, for the extension of their works and generating station. The amount claimed was close upon £9,000, but the company called witnesses to prove that the payment of about £5,000 would be reasonable. The jury returned a verdict for £6,500.

Claim in Respect of Lead Lights.—At the Hastings County Court the case of *Froy and Sons* v. *Salter* was heard recently. This was a claim for goods sold, £51 19s. There was a counter-claim for damages, which was not admitted.—The defendant, Thomas Salter, a builder, stated that he obtained a contract to build a house in 1897, a Mr. Tree being the architect. It was arranged that the plaintiffs should supply the lead lights, a guarantee being given that they should be executed in a workmanlike manner. In December, 1898, witness wrote objecting to the way in which the work was done, and Mr. Tree complained the following month. In February the plaintiffs sent some men down to set matters right, but in April the architect had to complain again, as the work done had been of little effect. As plaintiffs declined to do anything more, the certificates from the architect were delayed, and witness suffered inconvenience.—His Honour gave judgment for defendant for £29 18s. 6d. on the counter-claim.

Responsibility for Materials supplied.—On March 8th, in the King's Bench Division of the High Court of Justice, before Mr. Justice Channel, Messrs. Edward Bingham, of South Kensington, recovered £152 10s. from Mr. Everett Turner in respect of certain ranges and marble steps supplied by the plaintiffs for the defendant's houses at Brighton. It appeared that the plaintiffs entered into a contract with Mr. J. H. Hackman, a Brighton builder, under which the latter undertook to build four houses in Dyke Road, Brighton, and the question in dispute was whether the plaintiffs were entitled to recover from the defendant, the building owner, or the builder. The action turned upon a certain clause in the building contract which gave the architect power to decide whether the building owner or the builder should be responsible for materials supplied by special artists and tradesmen. The architect certified against the defendant, and his Lordship having found accordingly, judgment was entered against defendant for the full amount claimed.

The Grove Asylum.—In December, 1898, Messrs. Kirk and Randall, builders and contractors of Woolwich, issued a writ against the Metropolitan Asylums Board in respect of a claim for £34,445, subsequently increased to £41,175 4s. 11d., with regard to the building of the Grove Fever Hospital at Tooting Bec, S.W., chiefly on account of damages for alleged delays by the architect, Mr. A. Hessell Tiltman, F.R.I.B.A., of Russell Square, W.C. The action was commenced recently in the Court of Mr. Pollock, Official Referee. The opening statements of counsel occupied four days, and the hearing of evidence on behalf of plaintiffs three other days. At the end of the third day's evidence the plaintiffs made an offer to withdraw the whole of their claim providing they were not asked for costs. This proposal was considered by the Metropolitan Asylums Board in committee, and when the case was again mentioned in Mr. Pollock's Court, on March 5th, counsel stated that an agreement had been arrived at on these terms. Judgment was accordingly entered for the defendants, each party paying their own costs.

Whitewashing a Ceiling is "Repairing" a House.—The case of *Maria Dredge and another* v. *Conway, Jones and Co.* was heard in the Court of Appeal last Thursday. This was an appeal by the applicants from an award of the learned judge of the Gloucester County Court, holding that a workman had not met his death in circumstances that entitled his relatives, the applicants, to the benefit of the Workmen's Compensation Act, 1897. The case was argued in November, and stood over pending the decision of the House of Lords in *Hoddinott* v. *Newton, Chambers and Co.* (reported in our issue for December 19th last). The Master of the Rolls, in giving judgment, said the workman met his death from injuries received by falling from a board supported on two pairs of steps on which he was standing in order to whitewash the ceiling of the room. In his opinion whitewashing a ceiling was not "repairing" a house by means of a scaffold within the meaning of the words of the Act of 1897. But the House of Lords had held differently in *Hoddinott's* case, and this court could but bow to its decision. The appeal of the applicants must, therefore, be allowed; and as the learned County Court judge had found they would be, if his decision as to the law were reversed, entitled to the sum of £253, judgment for that amount would be entered for them, with costs. The other Lords Justices concurred.

What is a Workman?—The case of *Simmons* v. *Faulds* was heard last Wednesday in the Court of Appeal. This was an appeal from an award of the judge of the Lambeth County Court in an arbitration under the Workmen's Compensation Act, 1897. The applicant for compensation was George Richard Simmons, a foreman bricklayer, who was injured by an accident while engaged in a building operation for Andrew Faulds, from whom he sought compensation. The evidence of the applicant was to the following effect:—That he tendered to Faulds for the job in question, giving an estimate of £160, that he started work on that arrangement, that he was to be paid as the work progressed, that he used to draw about 75 per cent. of the work done, that he was not to supply any material, that his tender was for labour and tools, and that he had been working on the job about eight weeks before the accident. The County Court judge was of opinion that although a man was a sub-contractor he might be a workman within the meaning of the Act, and he made an award in favour of the applicant for a weekly payment of £1. Faulds appealed. The Master of the Rolls said that the Act applied to workmen only, and not to contractors, and the evidence was clear that in this case the applicant was a contractor to supply labour. The Lords Justices concurred.

Hoardings around Buildings.—At the Eastbourne Borough Bench, Henry Brewer was recently summoned for failing to erect a hoarding around a certain building, situated at 149 Langney Road, which he was taking down. Mr. Field (building surveyor to the Corporation) stated that he noticed workmen pulling down a house in Willoughfield Road. Slates and brickbats were falling into the road. He told Mr. Brewer that a hoarding should have been erected to avert danger to passengers, and wrote to him on the same day giving him a written order to erect a hoarding. On March 1st nothing had been done, and he therefore wrote to Mr. Brewer again, reminding him that he was liable to a penalty of £5 and a daily fine of £2. He received a reply from defendant to the effect that he was not liable, and that a firm of auctioneers and house agents were responsible. On March 6th one post and a couple of poles were put in front of the building as a fence, but no hoarding was erected. Defendant explained that he placed a board across the footpath to prevent people getting into danger, and he thought that was quite sufficient. The Chairman said it was clear the magistrates could not inflict a small fine, as it would be to the advantage of the contractor pulling down a house not to go to the expense of erecting a hoarding, because the fine would be smaller than the cost of the hoarding, and in that way the contractor would make money by disobeying the law, and at the same time imperil the safety of the public. As the cost of erecting the hoarding would be about £2, they had decided to impose a fine of £2, which would probably be increased in a fresh case.

Screens in Churches.—In the Lower House of Convocation, Church House, Westminster, Sir Arthur Charles, Dean of the Arches, held a special sitting of the Court of Arches last week for the purpose of delivering judgment in the case of the Rev. Charles E. Grenside, vicar of St. Anselm, Pinner, and his churchwardens, with Mr. G. T. Shilbeck (donor of the screen) attached (appellants) and Dr. T. H. Tristram, K.C., Chancellor of the Diocese of London (respondent). In August last the appellants moved in the Consistory Court of London, held in the Wellington Chapel of St. Paul's, for a faculty authorising the erection of a screen in the chapel-of-ease of St. Anselm, Pinner, on which were to be placed representations of Christ on the Cross, with figures of the Virgin Mary and St. John the Baptist on either side. The Chancellor held that the ornament was illegal. A grievance was alleged, and the matter came on in appeal. In delivering judgment Sir Arthur Charles said that the whole question, to his mind, turned on the point whether the screen, if erected in the position in which it was proposed to be placed, could be used as an object of superstitious reverence, or whether it could be merely regarded as a piece of architectural decoration. In cases decided there had been much divergence of opinion Previous judgments, to his mind, went to show that their lordships had no intention to decide that a representation of the Crucifixion on a screen placed in a church could, in any circumstances, be looked on as illegal when erected. He was, therefore, unable to agree with the construction placed on the matter by the learned Chancellor of the Court below. There was nothing in the church in the nature of a rood-loft or beam, and he therefore could not regard the screen as unlawful. The decision of the Chancellor of London was therefore upset.

Removal of Old Building Materials.—In the Commercial Court of the King's Bench Division the case of *Robinson and Co.* v. *Horne and Co* was heard last Wenesday. In November, 1899, the defendants, a firm of auctioneers, sold by auction the materials of a range of buildings forming Reid's Brewery in the Gray's Inn Road, the site having been acquired by the London County Council. The plaintiffs, who are dealers in old metals, bought certain lots at the sale, including four lots of iron girders and columns in the basement, for which they paid to the defendants at a later date £297. The conditions of sale printed in a catalogue issued by the defendants provided that the lots were to be taken down and cleared away from the premises within certain times. The sale took place on November 21st, 1899, but by the following June the plaintiffs had not removed their four lots, and the defendants therefore resumed formal possession of them. The plaintiffs sought to recover in this action the goods in question or damages for their detention or conversion, or alternatively the sum of £297 as money paid for a consideration that had failed. Mr. Justice Bigham, in giving judgment, after referring to the conditions of sale, said that the four lots purchased by the plaintiffs consisted of iron girders and columns in the basement of the stores. There were four stores in the building, and each had a basement in which were iron columns and girders supporting a brick archway, above which was a layer of concrete, and on the concrete was a granite floor, which formed the floor of what might be called the ground floor of the stores. It was clearly the duty of the plaintiffs to remove the columns and girders, and to do what was necessary to detach them from the soil and from the superincumbent arches and cement. The other lots which the plaintiffs had bought were above ground and easy to remove and dispose of. These had been removed. The question was, Whose fault was it that the columns and girders had been left? It was not the defendants' fault, or, as had been suggested, the fault of the purchaser of the brickwork. It was wholly the fault of the plaintiffs themselves. Repeated complaints had been made of the delay; in the first instance the only excuse made by the plaintiffs was the difficulty which they had in moving their other lots. Later on it was suggested that the delay was due to the fact that the cement on the top of the brickwork of the arches was covered by so much brick rubbish that it was impossible for the plaintiffs to get at the columns and girders without incurring considerable expense, which, it was said, ought not to be incurred on their account. This was, in his Lordship's view, a mere excuse, put forward, not because the plaintiffs could not, but because they did not want to, remove the girders and columns. There had been no detention or conversion by the defendants nor had there been a total failure of consideration, and judgment would be entered for the defendants; but his Lordship said that he hoped that if the plaintiffs desired it they would be permitted by the County Council or the defendants, so far as they had anything to do with it, to enter on the site and remove their goods. Judgment for the defendants with costs.

WHITECHAPEL ART GALLERY.

THE new Art Gallery at Whitechapel was formally opened by Lord Rosebery last week. It has been erected at a cost of about £16,000, including the site, building and furnishing, the chief contributors to the building fund being Mr. Passmore Edwards, Mr. Yarrow, Lord Iveagh and Mr. Edgar Speyer. Mr. C. Harrison Townsend, F.R.I.B.A., was the architect.

The material used is the softly-tinted terracotta of which the Bishopsgate Institute was built, and which was described by the late Sir Edward Burne-Jones as "most beautiful." It was supplied by Messrs. Gibbs and Canning, Limited, of Tamworth. The architect, as an advocate of the wider use of colour in London street frontages, has, as at the Horniman Museum, made a prominent feature of the introduction of a large mosaic panel, suggestive of the objects of the building. It will be 25ft. long by 13ft. high, and will be recessed between the two turrets so as to allow a pent roof to protect it from the beating weather. This panel has not yet been executed, but a beautiful design for it has been prepared by Mr. Walter Crane. The subject of the design is "The Sphere and Message of Art."

Two galleries are provided, one on the ground floor and one on the first floor, sufficient to accommodate about 500 pictures. The ground floor consists of a hall as it were with nave and aisles, the latter being roofed with glass. It is 17ft. high, 100ft. long and 48 ft. wide. The upper hall is 18ft. high, 100ft. long and 26ft. wide, and is top-lighted. Besides these there is an annexe on the ground floor. The walls are covered by a rough crimson canvas over which are fixed the wood strips for supporting the pictures. The circulation necessary to a great picture gallery has been borne in mind throughout the building, and double staircases are provided for ingoing and outgoing visitors respectively. The gallery is heated by Grundy's system, and lighted throughout by electric light. The chief contractors were Messrs. J. Outhwaite and Son, of 34 Upper East Smithfield, Tower Hill, E.C.

It is proposed to hold four or five exhibitions in the gallery each year, some of pictures, others of various crafts and different periods of art. The control of the gallery is vested in a body of trustees, of whom Canon Barnett, of Toynbee Hall, is chairman. The endowment of £500 a year does not do more than cover the expenses of the staff and the lighting and heating of the building.

It is not proposed to attempt to make a permanent collection of pictures, as it is improbable that a really first-rate collection could be gathered together, and it is thought that the interest in the gallery among the people of the East End will be better maintained by short loan exhibitions of objects of real excellence. An attempt will be made to explain these collections to visitors by means of lectures, and the organising of "guides" to take small parties round the gallery. It is also proposed to organise a lending collection of framed reproductions of pictures on the lines of a lending library. The director will be pleased to receive contributions for these collections. The present exhibition of pictures will remain open for five weeks, and will then be succeeded, about Whitsuntide, by an exhibition of Chinese art. The loan of any objects of Chinese art for the coming exhibition will be welcomed by the committee.

Engineering Notes.

A new Bridge at Kildonan has just been completed by the Arran District Committee of the Buteshire County Council. It is of steel and concrete.

American Steel Combine: A Counter Move.—Messrs. William Jessop and Sons, of Sheffield, contemplate establishing works for certain branches of their business in the United States.

The new Infectious Diseases Hospital at East Boldon, is being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Distington Parish Church is being fitted with "small tube" hot-water heating apparatus by Messrs. John King, Limited, engineers, of Liverpool, who employ their improved economical coil heater with waterway firebars.

Tender for Widening Byker Bridge, Newcastle.—At a meeting of the sub-committee of the Town Improvement Committee of Newcastle Corporation last Wednesday, a tender was accepted for the widening of Byker Bridge. The contract will in all probability be completed within six months.

British Engineering.—In proposing the toast of "British Engineering" at the sixteenth anniversary dinner of the Institution of Junior Engineers, held on Saturday last, Sir Walter Peace, Agent-General for Natal, said there was some doubt as to whether British engineers were keeping abreast of the times. Ten years ago they had a practical monopoly of iron and steel markets in the Colonies, but that was now passing away. In his opinion it was most necessary to standardise the various qualities of iron and steel. The chairman (Professor J. Perry), in responding, said that standards were going to be arranged by the National Physical Laboratory.

Hampstead "Tube" Railway: Council Successful.—The whole of the objections raised by the Hampstead Borough Council in regard to the proposed Charing Cross, Euston and Hampstead Railway have been met by the promotors, who have agreed to insert the required provisions in the Bill. Among these is one prohibiting the company from generating or supplying electricity within the borough; another prohibiting the company from erecting a station anywhere in the borough north of the station in Heath Street already sanctioned; and another making it compulsory for the company to first submit the elevations of the proposed stations in the borough to the Council for their approval.

Electric Railways.—In the first of a series of three Cantor lectures on "Electric Railways" given at the Society of Arts, Major Philip Cardew, R.E., electrical adviser to the Board of Trade, pointed out that for short distances electricity had no rival, but the saving of time on long journeys was, perhaps, not yet possible. Already they heard of electric trains going 100 miles an hour, and no doubt that was practicable with proper construction and equipment of rolling stock. What appeared to be doubtful was not whether a speed of 120 miles an hour could be accomplished, but whether it would pay to provide such a service within the limits of the British Isles. A Midland Railway expert had calculated the cost of electric traction at 8d. per train mile, as compared with 9d., the present cost of steam traction.

Gas Engineering as a Profession.—In the course of an address before the Southern District Association of Gas Engineers and Managers last Thursday, Mr. Corbet W. Woodall, the well-known gas engineer, called attention to the inadequate supply of the right kind of aspirants for gas engineering appointments. One explanation which had been offered for this unsatisfactory state of things was the alleged poverty of the prospect offered by gas engineering to young men of talent. This imputation upon the profession he could most emphatically repudiate. Neither was it true that gas was a dying industry. Leaving these professional matters, he referred to the use of gas for public lighting, and made the statement that London, which saw the first gas company started nearly a hundred years ago, was at this hour the worst-lit capital city in Europe.

Comparative Costs of Overhead and Conduit Systems of Electric Traction.—In the course of a lecture delivered last Friday before the Institution of Mechanical Engineers on "Combined Trolley and Conduit Tramway Systems" Mr. A. N. Connett said that the question of the cost of conduits must be treated in a general way, local circumstances being such a large factor in the determination of cost that no other method is possible. The side-slot conduit can be built for about £500 less per mile of single track than the centre-slot. It is generally stated that a conduit road costs twice as much as an overhead-trolley road. This statement may be misleading, owing to the fact that an overhead-trolley road may be very variable in its cost, depending upon pavement requirements, overhead construction adopted, and many other local conditions, such as the regulations for the return current by the rails. But the construction of the conduit part of a road is quite independent of these factors—that is, for an overhead-trolley road which would cost £5,000 per mile of single track; it is quite probable that the same road with the conduit construction would cost £11,000 for the same length. If the overhead-trolley line should have a first cost of £10,000 per mile of single track there is no reason why the use of a conduit on such a line would double the cost as in the first instance. Roughly speaking, the cost of a conduit in this latter case would be £16 000. A conduit road will cost from £5,000 to £5,500 more per mile of single track than a trolley road under the same conditions, to which should be added the increased cost of special track work and the removal of underground obstacles. Under ordinary conditions the difference in cost will vary between the limits of £7,000 and £9,000.

Acetylene Gas.—This was the subject of a paper read by Mr. Isaac Low, jun., before the Glasgow Architectural Society on March 11th. The production of acetylene gas by the action of water on carbide of calcium, he stated, was first discovered by Edmund Davy, a Dublin professor of chemistry, in 1836, and communicated by him in that year to the British Association, but the difficulty in manufacturing the carbide prevented the process getting beyond the stage of a laboratory experiment at that time. After the invention by Siemens of the electric furnace, carbide was accidentally produced by the action of its intense heat on the lime and carbon which were found to be the most suitable materials for the lining of the furnace, and in 1892 an American chemist also rediscovered carbide in the course of experiments with the metal calcium. It did not, however, become a commercial product till the year 1895. The light produced by acetylene is twelve times as brilliant as that produced by a similar quantity of coal gas, and the cost at the present market price of carbide is equal to that of coal gas costing 4s. 7½d. per 1,000 cubic feet. A description was given of the three main types of apparatus used for the production of the gas—those in which water is dropped on to carbide, those in which water is allowed to rise round carbide, and those in which carbide is dropped into water, preference being given to the last, owing to the smaller amount of heat generated and the greater purity of the gas. Acetylene is more largely used as an illuminant in Germany than in this country. Owing to the richness of the gas special burners are needed. The gas is non-poisonous and in burning it vitiates the air less than coal gas. On account of its characteristic odour, escapes can be easily located.—At the same meeting the office-bearers for the year were elected—Mr. James Chalmers, I.A., being appointed president; Mr. Ninian Macwhannell, I.A., and Mr. John L. Duncan vice-presidents; Mr. Alexander Gardner, 209 St. Vincent Street, hon. secretary; and Mr. William Howatt, I.M., 146 Buchanan Street, hon. treasurer.

Correspondence.

Bricklayer's Bond.

To the Editor of The Builders' Journal.

Walton-on-Thames.

Sir,—There is sometimes an uncertainty in the mind of an architect as to the bonding of bricks. Your issue for March 6th contains illustrations by an architect showing how he would arrange his bricks in building a chimney stack, &c. I do not think that any bricklayer would take kindly to the method shown. No doubt many of your younger readers would prefer to be guided by an architect in such matters, but perhaps they would not object to be shown how the same work would be set out by a practical bricklayer. The writer of the article in question explains that angle fireplaces contain an enormous quantity of cutting. His drawings clearly show this, but the practical bricklayer would avoid unnecessary cutting and arrange his bricks so as to get strength in bonding; he would also be careful to show on the face of the work that it was so bonded—this cannot be done by the method used in the drawings referred to. Outside the roof it is usual to carry up the stacks in very hard red bricks, or very hard stocks, so that the less cutting the better.

In the accompanying drawings I have made use of the same angle fireplaces shown on page 85 of your issue for March 6th, but with the flue as it would most probably be in the work, and the bond as worked by a bricklayer. The position of the flue mentioned might, perhaps, be parallel with the plain side of the wall. The alternate courses are shown and all the cutting proper, namely, bird's-mouth bricks, which would be cut down below (see Fig. 1).

Figs. 2 and 3 represent alternate courses in the same chimney stacks (like those in the article), bonding properly and showing on the face that strength has been considered. Fig. 4 shows how a chimney stack with the flues at an angle outside the roof would be built. Fig. 5 gives alternate courses of a 14in. wall, old English bond, as generally worked, that is, with quarter (header) bond in the angle. Fig. 6 gives alternate courses of the same wall worked as shown in the illustrations referred to, which by some would be objected to on account of their being bonded in by the stretcher. Fig. 7 shows alternate courses of 14in. wall, Flemish bond. This would, in some instances, be tied in the angle with two headers instead of the stretcher, as shown, and in other cases the small pieces would be omitted. Fig. 8 gives alternate courses of the same wall built so as to be more readily filled in with "bats," of which there is generally no lack. Of the two arrangements of "Flemish bond," Fig 8 is the most convenient, for various reasons.

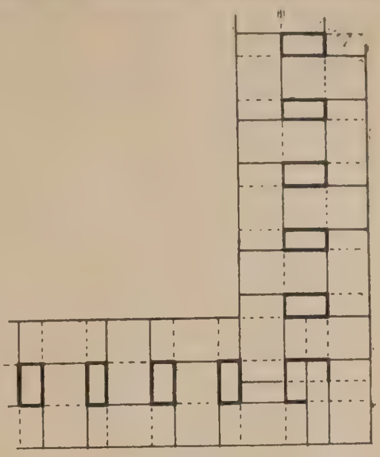
The flues shown are supposed to be properly pargetted. When flue-pipes are used the adjacent bricks are cut away, but this should not affect the bond.

There is one thing often lost sight of by architects, the omission of which entails more expensive cutting than is caused by angle fireplaces. Plans showing the openings are frequently figured in, giving the exact width of openings quite regardless of the length and nature of a brick. The adjoining brickwork has then to be arranged to suit, when possibly the openings might have been shown very slightly wider or narrower, so as to exactly suit the bricks.—Yours truly, R. RAMM.

To the Editor of The Builders' Journal.

Southampton.

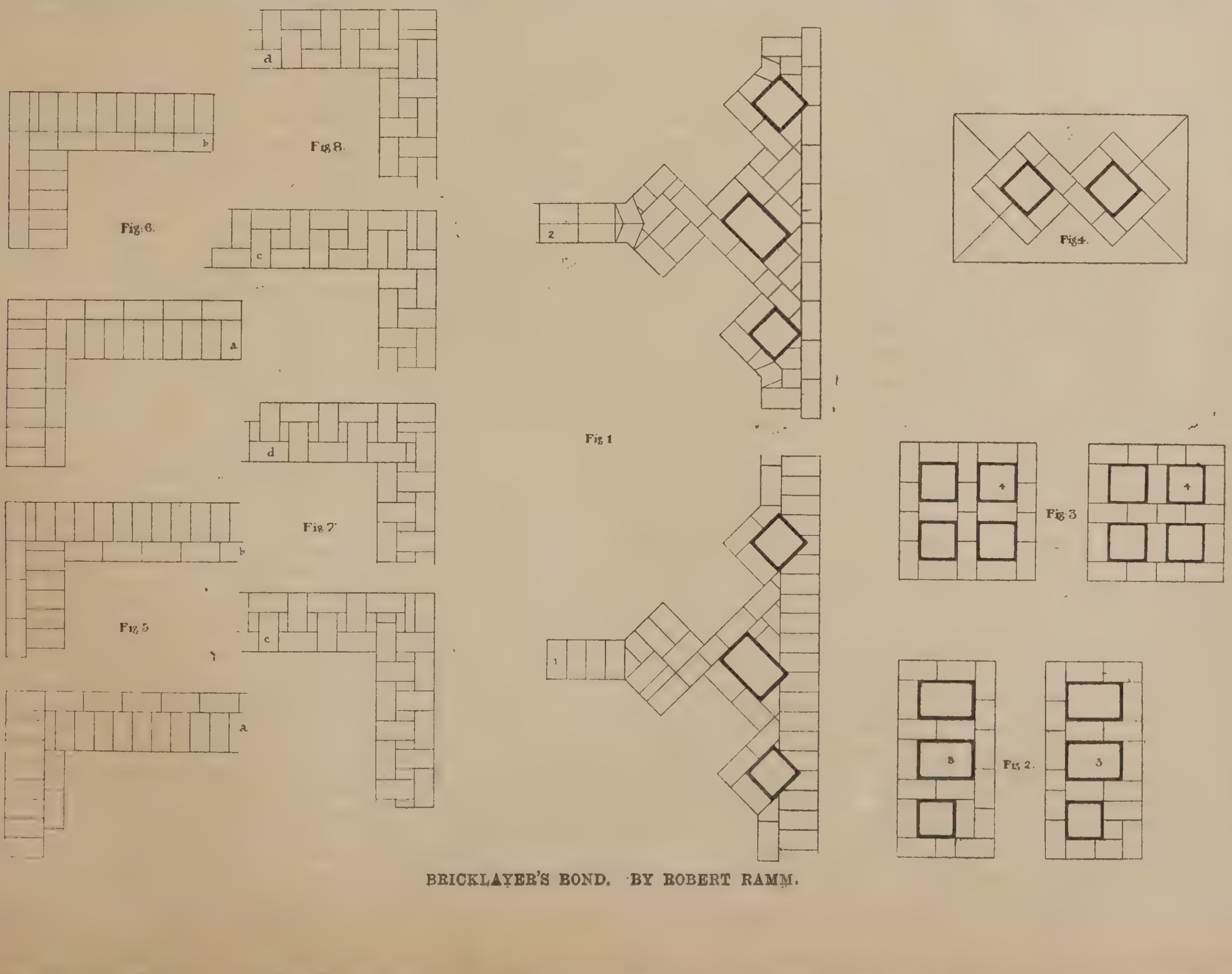
Sir,—I have read Mr. Robert Ramm's letter with the greatest interest, for we are more in accord than he seems to think. He begins by criticising the angle fireplace, saying that "the practical bricklayer would avoid unnecessary cutting." In his own suggestion for bonding this work he shows 6ft. 8in. cutting in one course and 4ft. 4in. in the next, giving an average of 5ft. 6in. per course, which is, as I have said in my article, "more than 5ft. run of splayed cutting in each course." I confess I am unable to understand his meaning in the latter part of his first paragraph, for my bond (English) most distinctly shows on the outside and has only one straight joint of about 3in., while my critic shows twelve of them with a total of 4ft. 10in. run. There is some remarkable cutting in his bird's-mouths, and how many bricklayers could be trusted to cut these puzzle blocks so as in any way to preserve the bond? I fear they would be superseded by odd scraps of rubbish called euphoniously "'bats,' of which there is generally no lack."



BRICKLAYER'S BOND.
BY ROBERT W. CARDEN, A.R.I.B.A.

In regard to Mr. Ramm's second point (chimneys), it certainly appears at first sight that he avoids some of the cutting, but I contend that there is almost as much cutting in a *properly* cut three-quarter bat as in a splay. Now in Fig. 3 he shows six of these bats in each course, which seems to me to entail at least as much cutting as my four splayed cuts. Fig. 2 is unfortunate in having three straight joints in the same angle.

Figs. 4, 5, 6, 7 and 8 do not refer to my article, but are perhaps added for my enlightenment. Flemish bond, as everyone knows, is inherently weak in thin walls, but my critic has gone out of his way to weaken it in Fig. 7. I send a sketch of two courses superimposed, the straight joints denoted by thick lines: this works out to about 2ft. run of straight joint in each course per foot run of walling, that is to say, the spaces enclosed by thick lines are valueless, for a closer is hardly ever the neat little cubical block of brick that it



BRICKLAYER'S BOND. BY ROBERT RAMM.

appears on a drawing, but is usually a stray chip or splinter.

But perhaps my best answer to Mr. Ramm would be this—my article dealt with what a bricklayer *should* do and not with what he *would* do.—Yours truly,

ROBERT W. CARDEN, A.R.I.B.A.

The "Notyngham Porch," St. Mary's Church, Bury St. Edmunds.

To the Editor of The Builders' Journal.

London.

Sir,—When revising my letter on page 88 of your isssue for March 6th, you left out a rather important item, namely, the first part of the above title. The ceiling mentioned is that of the porch, not that of the church. I fear this will be rather misleading to your readers, as the breadth of the nave and aisles is nearly 70ft., the former being spanned by one of the finest hammer-beam roofs we possess.

Yours truly,
R. H. MAYHEW, A.R.I.B.A.

[We regret the error to which our correspondent draws attention : his former letter was not, however, quite explicit on this point.—Ed. B. J.]

Study of Gothic Work.

To the Editor of The Builders' Journal.

Eccles.

Sir,—Referring to the enquiry on page 105 of your issue for last week, "Edinburgh Student" will find all he wants in the "Churches of the Nene Valley," a work edited by Edmund Sharpe, of Lancaster, and comprising measured drawings and sketches by about half-a-dozen ardent students, including

Yours truly,
WALTER K. BOOTH.

War Department Building Prices.

To the Editor of The Builders' Journal.

Sir,—In reference to the reply on page 104 of your issue for last week with regard to the War Department building prices, "Student" had better apply to the District Paymaster, Army Pay Office, Pembroke Dock. By the regulations for engineer services of the army, "private architects and others" may (unless there are strong reasons to the contrary) "be furnished with printed copies of the schedule of prices on paying for the same at the rate of 3d. per page." The present price of the whole schedule is 15s., plus postage. The paragraphs of the "Regulations for Engineer Services, 1900," which govern the sale of schedules, are 562 and 563. "Student" might quote these to the Paymaster when writing.—Yours truly,

WAR DEPARTMENT SURVEYOR.

Wages Due from Bankrupt Employers.

To the Editor of The Builders' Journal.

Sir,—With reference to the enquiry on page 104 of last week's issue, I would express the opinion, with all due deference to "G.A.T.M.," that "Constant Reader" will find wages or salary are paid in priority only for services rendered during four months previous to the bankruptcy, and up to £50. My reason for writing to you is to correct the too general impression that wages are preferential debts under all circumstances. I know of a case of an assistant who recently lost a year's earnings through the bankruptcy of his employer, a well-known London architect.—Yours truly,

A. B.

Large Improvements to Calais.—The Calais Council propose to build a new Town Hall and a municipal theatre, and to lay out several boulevards on the extensive tract of vacant land near the town station between North and South Calais (formerly Calais and St. Pierre). The proposed improvement will much enhance the town and provide good class residential accommodation. The resale of the land as building frontage will provide the greater part of the cost of carrying out this important scheme.

Builders' Notes.

Mr. Evan Williams, a leading Bangor builder, died last week.

London County Council.—At last week's meeting of the Council Mr. McKinnon Wood moved: "That, in view of the decisive verdict of the electors of London in favour of the Council's water policy, a deputation be appointed to urge upon the President of the Local Government Board that the Government should allow the Council's Purchase Bill to pass second reading and to be referred to a committee of Parliament." He pointed out that the people were determined to wait no longer for the settlement of this question, and that they desired to have control of the water supply. It was idle to talk about newfangled schemes of water boards and trusts, for none of them would satisfy London. After considerable discussion the resolution was adopted.

Co-operative Carpentery and Joinery Workshops.—A branch of the Carpenters' and Joiners' Society in Hull, two years ago, owing to a strike which had lasted for eight months, formed a works department, which started business on a small scale. In open competition an important contract was secured, on which a handsome profit was made, and at the end of ten months the enterprise had yielded a profit of 21 per cent. The Hull men are confident that in due time they will absorb a large share of the local building operations. Numerous appeals have been made to the general council of the society to take action on the lines of the Hull branch, and 67 branches have passed resolutions in favour of such action. Amongst the proposals which apparently find most acceptance is one that during the four weeks of June next each of the 62,000 members of the society shall be asked to pay a levy of 6d. per week for the establishment of the "Amalgamated Society of Co-operative Joiners, Builders and Contractors in various large centres of industry in the kingdom." This levy would produce a sum of £6,200 for the establishing of business ventures in 18 industrial centres. According to this scheme, the five managers or committee men in each branch are to receive, in addition to joiners' wages for all time spent in business matters, a share of 16 per cent. of the profits; 40 per cent. of the profits are to form the nucleus of a fund for establishing similar concerns in other towns.

Salford Building By-laws.—The Salford Town Council recently considered the recommendation of the Building and Bridges Committee to the effect that application should be made to the Local Government Board to amend building By-law 13 (Sub-section C) so as to read as follows:—"If the wall does not exceed 35ft. in length it shall be 13½in. thick below the topmost two storeys, and 9in. thick for the rest of its height." Communications were read from the Manchester and Salford Independent Labour Party and the Independent Labour Party of the South Salford district protesting against the proposed alteration of the by-law, on the ground that it would have the effect of lowering the present standard and giving additional facilities to the jerry-builder. Happily the recommendation was passed. The action of the labour party is a most mischievous one, and if carried out by other bodies in districts in which the political power is in workmen's hands, will entail needless hardships. The plea that 9-in. walls for two storeys are against the principles of good building is a ridiculous one. The action was, presumably, really taken on the supposition that thinner walls would reduce the amount of labour required in the district. This is a fallacy, for if such wasteful methods were carried out they would increase the cost of building materially, resulting in speculative builders and building-owners being less inclined to build and causing increased rents, as is evidenced by the present depression in the building trades. The housing problem is made more complex by the irksome restrictions of the by-laws. Jerry-building could be guarded against without laying down rigid laws as to thickness of walls, &c., which would be unnecessarily thick with good construction.

New Patents.

These patents are open to opposition until April 20th.

1900.—Fireproof Floors.—2,739. A. W. Green, The Glen, 35 Gorst Road, Wandsworth Common, S.W. The floor consists of an arch of fireproof material stretching from girder to girder and a series of slabs which are held against the lower flanges of the girders by clips. These slabs have raised distance-pieces on their upper surface, so that an air-space is provided between them and the girders. Dovetail grooves are formed on the underside of the slabs in order to provide a key for the plaster ceiling.

Stoves.—2,759. W. Youlten, 159 Victoria Street, Westminster, S.W. A twin or triple grate is adapted to burn gas, coal or other fuel, as may be found most desirable. One grate has a suitable gas supply, and the other is constructed to burn coal, wood or other fuel, and the register is so arranged as to cut off communication between the flue and the grate which is not in use. According to the second part of the invention, a gas stove may be used in an existing coal grate, preferably by sinking it flush with the top surface of the hearth, being lifted into position when required.

Circular-Saw Benches.—5,670. N. Tailby, 76 Summer Row, Birmingham. In saw benches for cutting and ripping deals and battens a difficulty is often experienced in the automatic feeding of short lengths to the saw, owing to the spring of the material immediately on passing clear of the feed rolls. To avoid this, a guide and pressure attachment is provided between the rolls and the saw.

The following specifications were published on Saturday last, and are open to opposition until April 27th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—1,133, Boult (*Sauvalle*), incandescent electric lamps. 3 284, Farmer, gas burners. 3,317, Hall, guides for augers. 3,886, Heaphy, fire alarm thermostats. 4,006, Marsden, Lewis bolts. 4,053, Orme, means for manipulating doors, &c. 4,355, Challis, artificial stone. 4 803, Fessenden, electric incandescent lamps. 5 137, Gale, incandescent electric lamps. 5,149, Lambert, road macadam scarifiers. 5,285, James, girders for the construction of bridges, &c. 6,251, Johnson (*Schild and Lorey*), tie bars. 6,325, Etchells, doors for hoists. 6,629, Riley, filtering apparatus. 6 891, Sharp, smoke-consuming firegrates. 7,184, Messinesi, dovetailing. 7,285, Parsons, Belfield and Chapman, electric railways on the conduit system. 7,618, Kollinger, pipe or hose coupling. 7,737, Tribelhorn, arc lamps. 11,222, Ravenor, apparatus for testing drains. 11,560, Wurts and Hanks, electric incandescent lamps. 15,024, Dymond (*Lochman*), wood-carving machines. 17,729, Cook, door stop for protecting skirting boards, &c. 18,621, Holŭb and Dvorádek, apparatus for producing acetylene gas without gasometer. 20,732, Robinson, construction of staircases. 21,997, Lacroix, atmospheric gas burners. 22,941, Doyle, artificial stone. 23,013, Hartmann, band saws for sawing metal. 23,880, Gary, elevators.

1901.—221, Hausmann, sliding and swinging window sashes. 419, Heuer, heating stoves. 910, Dymond (*Schratwieser*), laths for plaster walls, &c. 1,190, Gopffarth, vices. 1,258, Cochrane, cowls for chimneys. 1.316, Shaber (*Sharer*), pipe joints. 1,460, Peter, wooden pulleys. 1,471, Bogia, electric arc lamps. 1,559, Denton, flush tanks for water closets.

Notice to Advertisers.—The new series of The Builders' Journal, which will commence with the issue of April 3rd, referred to on page 109, will offer special advantages to advertisers, who should apply for space as early as possible.

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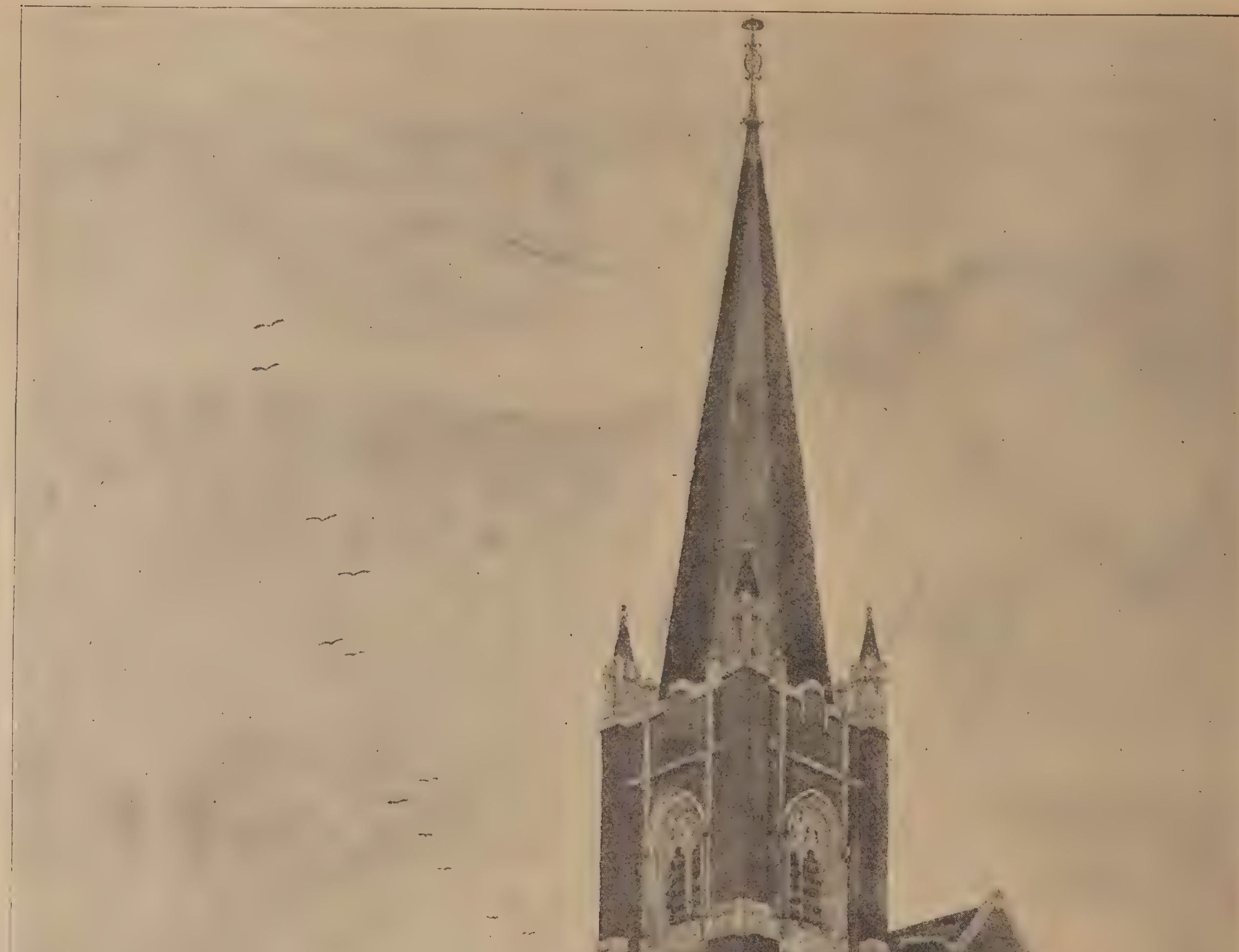

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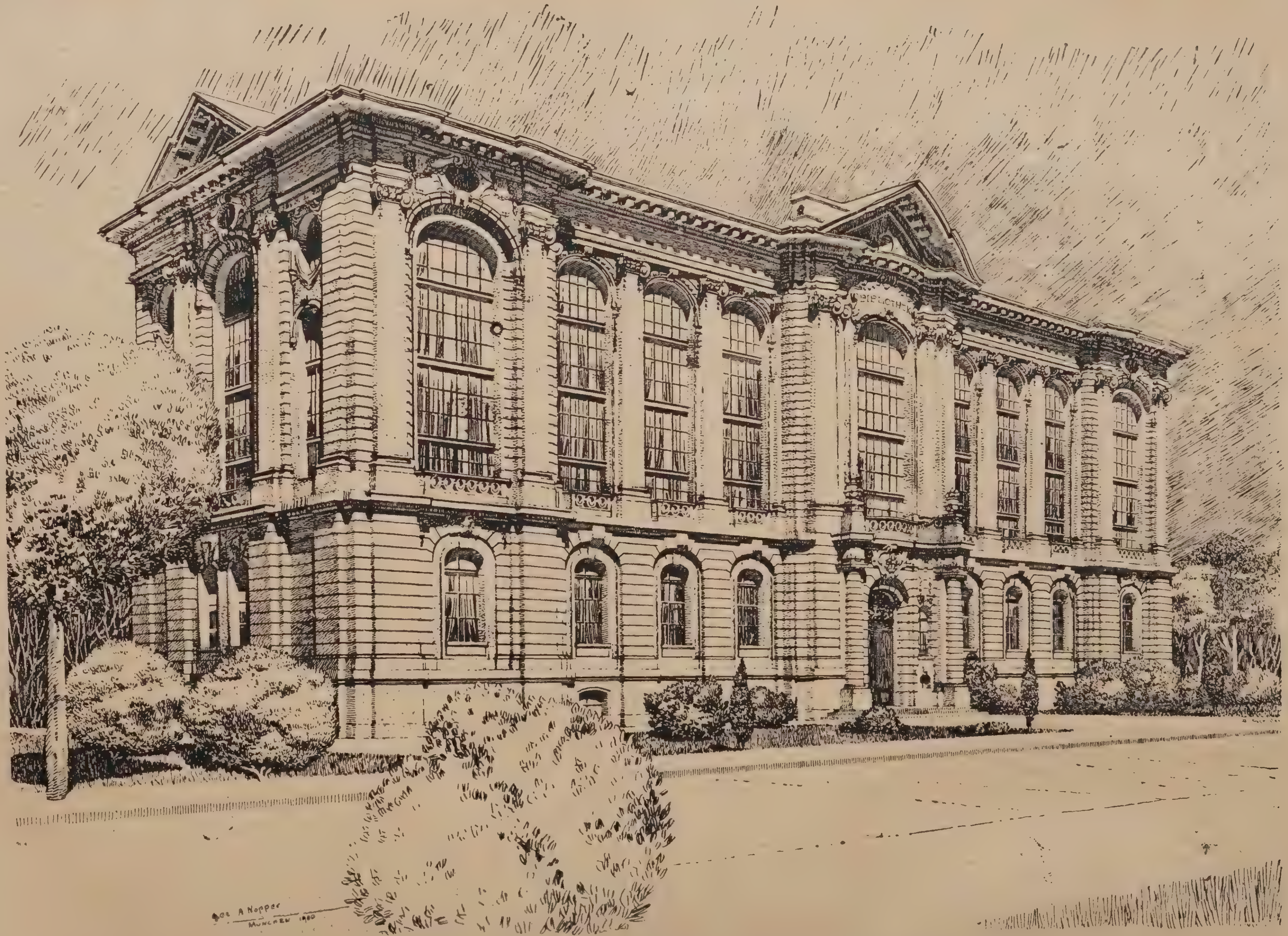

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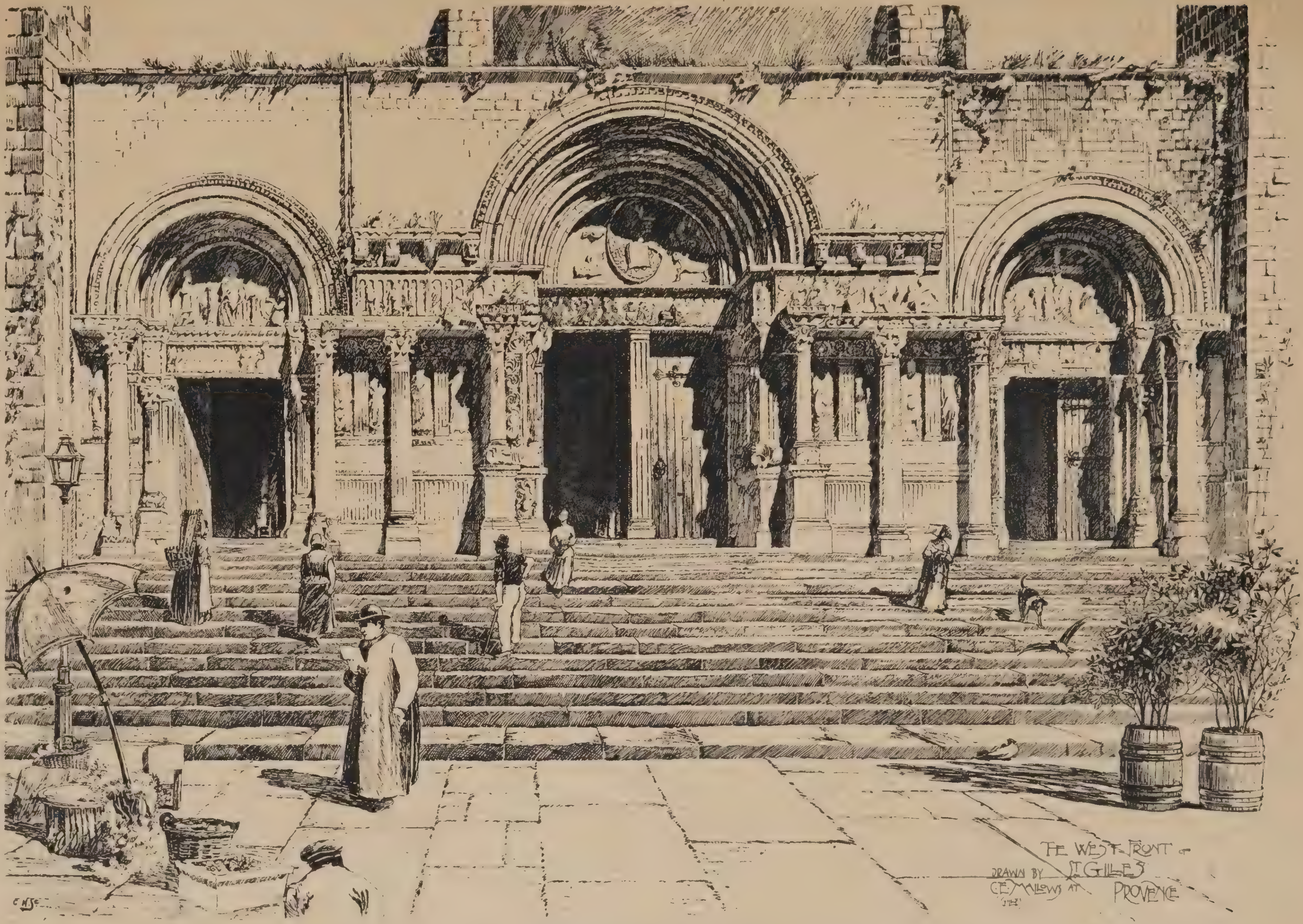

PORTAL OF ST. GILLES CHURCH, PROVENCE, FRANCE. Drawn by C. E. MALLOWS.

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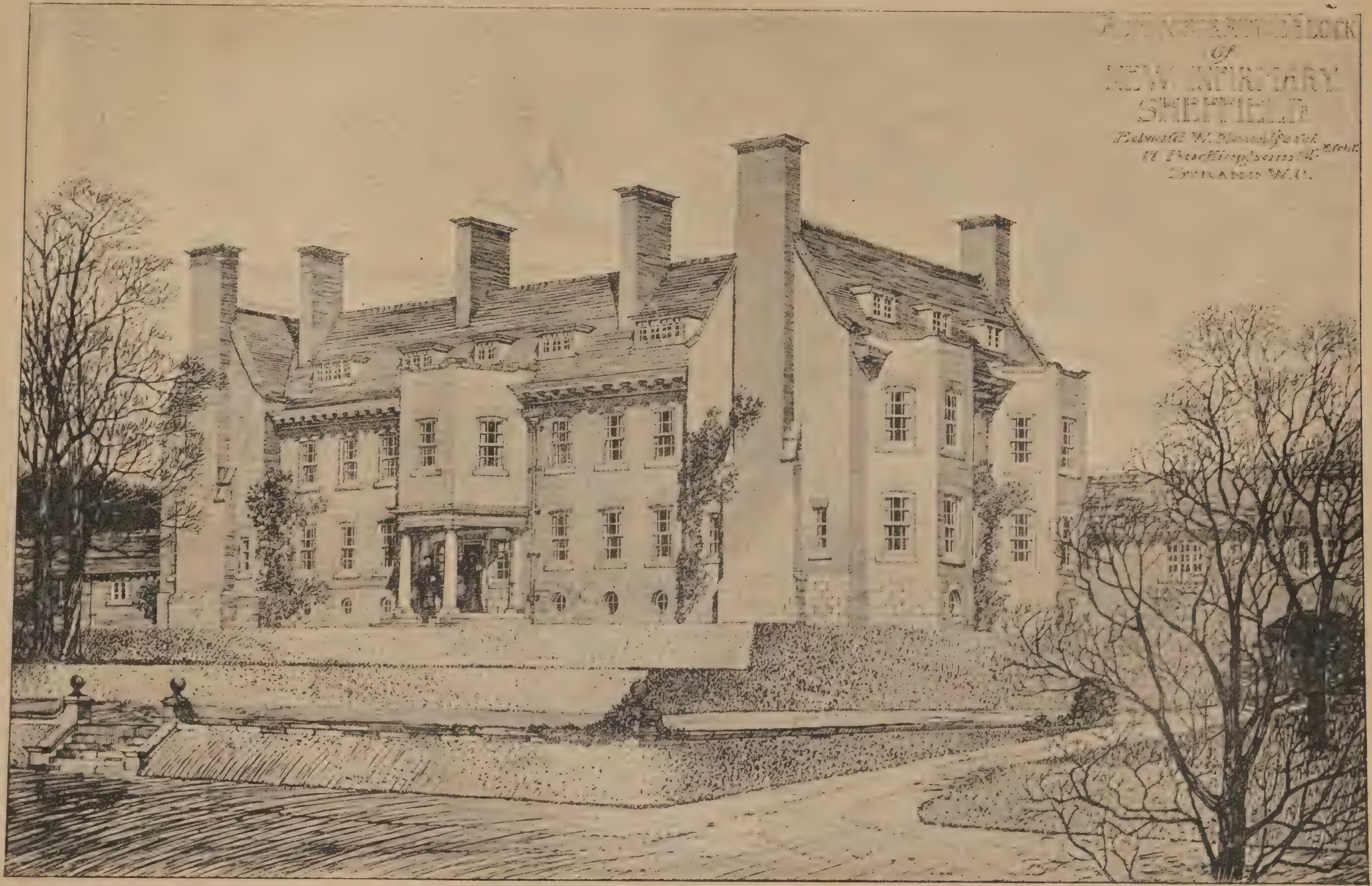

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Bricks and Mortar.

APHORISM FOR THE WEEK.

Art is the perfection of Nature.
SIR THOMAS BROWNE.

Our Plates. ST. GILLES' CHURCH, Provence, France, was begun by Alphonse Jordain, of Toulouse, early in the twelfth century, but owing to the troublesome times with which it was connected it was in all probability never completed. The famous portal, with its wonderful carvings, is cleverly represented in Mr. Mallows's drawing.—Our illustration of the public library at Ausburg, Bavaria, is taken from the "Architektonische Rundschau." M. Dülfer, of Munich, is the architect. The building contains 200,000 volumes of considerable value. The drawing of Mr. Mountford's administrative block at the new Sheffield Infirmary was exhibited at last year's Academy.

Roman Masonry. AT the London Institution recently a paper by Mr. John Terry, the City Clerk of Works, on a portion of the Roman wall unearthed in Old Bailey, near the Sessions House, was read before the members of the London and Middlesex Archæological Society. The discovery was made at a depth of 18in. below the pavement level, and 99ft. from the centre of the carriageway. The specimen of masonry in which so much interest is centred is 8ft. high and 8ft. 3in. thick above the foundation. Commencing from the base of the foundation, which is of ballast, there are revealed 3ft. 6in. of rubble work, then three courses of tiles, sesqui pedales, and above these 2ft. 7in. of ragstone. Then come two courses of tiles, followed by more rubble work. The interior of the wall is of ragstone, roughly tumbled in and grouted with lime mortar of an excellent description. The whole forms a hard concrete mass. The inner face of the wall is in a good state of preservation, but the outer face shows to a marked extent the action of the water of the mediæval ditch. The mortar analysed by Mr. N. F. Hills is declared to be chemically and physically excellent, the proportion of lime to sand by volume being about one to two.

Venice and the Mainland. A LADY writes to the "Times" with regard to the proposal made by a certain influential commercial class of Venetians for erecting bridges to connect Venice in different directions with the mainland. Already three different plans, with varying estimates, have been prepared and presented to the municipal authorities for acceptance. Says this lady: "Can nothing be done to check this appalling scheme, justly named by the 'Tribuna' 'disegno bestiale'? Is Venice, world-famed Venice—the Venice of poetry, the Venice of history, the Venice of our dreams realised or unrealised—to be allowed to be destroyed for the sake of commercial advantage and gain to a few? Surely, if anyone with influential name would start a petition against such wanton destruction of one of the loveliest places in the world, all who have ever been, or ever hope to be, in Venice would gladly sign it, and those Venetians (unworthy of the traditions of their great city) might be brought to see that their immediate pecuniary loss by the absenting themselves of the customary visitors who pour in to see ancient Venice might exceed the desired prospective gain of iron-bridged modern Venice."

A Unique Exhibition at Darmstadt. THE young Grand Duke Ernst Ludwig of Hesse, grandson of Queen Victoria and son of Princess Alice, has recently called into existence a colony of artists at Darmstadt. The members consist of architects, sculptors and painters, invited from all parts of Germany and Austria, and include the well-known architect, Professor F. W. Olbrich, of Vienna; Professor Hans Christiansen, of Schleswig-Holstein; Professor Peter Behrens, of Hamburg; and Ludwig Habich, the sculptor of the monument to the Princess Alice now in course of erection at Darmstadt. In founding this artists' colony, the Grand Duke has had chiefly in view the development of art in the direction of technical education and of industry. He considers, rightly, that the more Berlin becomes the political and social centre of Germany, attracting the pick of the younger and more ambitious artists, so much the more it becomes the duty of the rulers of the smaller German states to foster the development of art in their own domains, and that duty is best fulfilled by bringing beauty into the homes of the people. The little colony intends to open on May 1st next an exhibition for which it claims originality of conception and thoroughness in execution. It will consist of a central building, named after the Grand Duke the Ernst Ludwig House, broad and symmetrical in design, built after the plans of F. W. Olbrich, and containing the common ateliers, assembly-rooms and so on of the Colony. The rest of the exhibition—and this is its novel feature—will consist of the dwelling-houses of the various members. The designs of the houses themselves, as well as of every piece of furniture or utensil they contain, have been elaborated with the most artistic care, and the work has been executed in the best and most modern style. The exhibition will remain open till the end of October.

The Castle Garth, Newcastle-on-Tyne. THIS picturesque old thoroughfare, situated within the precincts of the castle, is now nearly all pulled down to make way for modern improvements. At one end stands the Black Gate, a gloomy thirteenth-century gateway with a seventeenth-century tower as superstructure. At the other end is the fine Norman keep of the fortress. Both are happily in the occupation of the Newcastle Society of Antiquaries. (Neither is shown by Mr. Fred. W. Morgan in the sketch reproduced on this page, but the graceful perpendicular steeple of the cathedral church of St. Nicholas rises over the house-tops, pictorially, just where it is needed). The street, at one time a busy place, but now deserted, has a peculiar history. In 1619 one Alexander Stephenson obtained a lease of this quarter, by which its occupants enjoyed certain valuable rights and privileges, making them independent of the trade guilds and of civic jurisdiction; being in the heart of the town it became a thriving trade resort, and continued so for 200 years or more. Newcastle has altered considerably of late, and its old buildings are rapidly disappearing. Some might well have been preserved; others, after all, are better swept away. In any case most of them have so much of that quiet artistic treatment in their general outline and detail, so much that is worth perpetuating, that it is not without a pang one sees them disappear and give place to pretentious structures, too often remarkable only for their size and vulgar ornament.

The Castle Garth
Newcastle on Tyne

The Memorial to Queen Victoria. MR. J. OLDRID SCOTT, F.R.I.B.A., writing to the "Times," says: "The suggestions are limited to these—a chapel, to be erected in the near neighbourhood of the Abbey, and an architectural structure with a statue of the great Queen as its culminating feature, to be built either in the gardens to the south of the House of Lords or at some point in the Mall. The first proposal is a utilitarian one, as the chapel would become the place of interment for eminent persons for which no more space is to be found within the walls of the Abbey itself. Designs for a building of this nature were prepared by the late Sir Gilbert Scott and also by Mr. Pearson. The decision come to, however, by the Memorial Committee seems to be adverse to a structure of this kind, and, if so, the question is narrowed to the selection of a site for an architectural composition more or less on the lines of the Albert Memorial, though not of necessity in the same style. My object in writing is to point out a serious, if not fatal, objection to the site which has been suggested to the south of the Victoria Tower. It is this, that that tower is on so vast a scale that it would inevitably dwarf any memorial built in its immediate neighbourhood. A minor objection to this site is that it is so seldom seen by Londoners, as the road passing it leads to nowhere in particular. On the other hand, it seems to me that a very excellent position might be found in connection with the Mall, provided that it was not too near to Carlton Terrace, where the great height of the houses would prevent a good effect being obtained."

Mr. Long and the Housing Problem. MR. WALTER LONG, the president of the Local Government Board, in a letter to the secretary of the National Housing Reform Council, says:—"That in view of the emphatic decision on the question of an extension of the period for repayment of loans which was arrived at in Parliament so recently as last year, he does not think he can hold out hopes that the matter is ripe for reconsideration by the Local Government Board. As regards the model by-laws, he is deeply impressed with the vast importance of throwing no unnecessary impediment in the way of those local authorities who are endeavouring to deal with the question of the housing of the working classes, and he is therefore at the present time engaged in very careful consideration of the by-laws of the Board, in order to ascertain whether alteration in any direction appears desirable, and, if so, whether such alteration could be made without any unwise relaxation of those standards which are considered essential for the public welfare."

Casting a Statue of Gordon. A WEEK ago the replica of the Chatham statue of Gordon by Mr. E. Onslow Ford, R.A., subscribed for by readers of the "Morning Post" and to stand in front of the college at Khartoum, was cast at Parlenti's Albion Foundry, Parson's Green, by Major-General Sir Andrew Clarke. The statue represents Gordon seated on a camel, and needed to be cast in several pieces. Within the foundry was the original model of the statue, which was presented by Mr. Onslow Ford to the Crystal Palace. Hard by was the furnace, and at the back of it was a pile of bronze ingots, which were put in one by one by an Italian workman. By the time all was ready for the casting the furnace held 3 tons of the molten metal. In front of the furnace one saw an oval bed of clay, from which a gutter led up to the hole from which the metal would presently issue. It stood over the centre of a great pit, and beneath it was a cubical mass confined by battens. Within that mass was the mould of the body of the camel, with the saddle and the plinth. The casting of a statue is an interesting operation. It is first of all modelled in clay, and from this model a hollow cast is made in wax. This model is touched up, and is then filled with a particular kind of sand. It is also surrounded with the same material, which is tightly packed, and which, under the action of heat, turns to a kind of clay. Then a fire is lighted underneath, and the wax is gradually burned away. In the end the sand which filled the cast is divided from that which surrounded it by the thickness of the wax. It is into this space that the metal flows at the moment of casting.

Fools who Build. Referring to Mr. Blashill's lecture on the present condition of the building industry, a report of which was published in our last issue, the "Liverpool Post" says:—"There is an ancient saying to the effect that fools build houses for wise men to live in. This apophthegm was evolved, no doubt, from the frequency with which in all ages the amateur dabbler in bricks and mortar has come to grief, for the professional builder, as a rule, is sufficiently skilled in the economising of labour and material to emerge at the big end of the horn on the conclusion of an enterprise, whether speculative or under contract. There are few men who have made their fortunes in business who remain unsmitten towards the evening of their days by the desire to build a house entirely according to their own notions, in which they may enjoy their *otium cum dignitate*. The fruition of this idea is generally the builder's golden harvest and the beginning of trouble for his employer. Often must the latter imagine that the whole race of constructive artisans—bricklayers, masons, carpenters, plumbers, and range-fitters—have entered into a conspiracy against his pocket and his peace of mind."

Sculpture at the Glasgow Exhibition. We learn from the "Morning Post" that the arrangement of the sculpture at the Glasgow Exhibition is in the hands of Mr. E. Onslow Ford, R.A., and Mr. George Frampton, A.R.A., who have devised a most ingenious method of lightening their labours. They have had a plan of the hall drawn to scale. They are in the happy position of knowing exactly what will be exhibited, and they have already given to each piece of statuary that is to be shown a numbered position. When the statues are sent in each will bear its allotted number and will be taken direct to its place, and if in any case a rearrangement seems necessary, it will be easily effected at the end. Those who visited the Paris Exhibition cannot have failed to be greatly struck by the sculpture shown, and especially by the way in which the British sculptors vindicated themselves, while their brothers who work in paint were brought into something like derision because their works were arranged and displayed with just about as much eye for effect as is to be observed in the stamp-album of "the human boy." It seems likely that at Glasgow, also, the art of the sculptor will be worthily represented. Among those who will exhibit are Messrs. Lucchesi, Fehr, Pegram, Thornycroft, Pomeroy, Taubman, Kellock Brown, M'Gill, Keller, Frampton, Onslow Ford, Walker, Tweed, Wood, Colton, P. Montford, Stirling Lee, Brock, Gilbert, J. M. Swan, Tenner, Dressler, Furse, Cecil Brown, Starke, Rhinde, Hodge, D. W. Stevenson, W. G. Stevenson, Drury, Sheriff, Webster, Shannon and C. Allen. The Countess Gleichen and Miss Giles will also exhibit. Mr. Onslow Ford is at present an extremely busy man. During the months of March and April he is teaching at the Royal Academy schools. At the end of April he will have to superintend the erection of his statue of Queen Victoria at Manchester. He is not yet at the end of his labours in connection with certain works which will be seen, if all goes well, at the summer show of the Royal Academy; and he will of course need to visit Glasgow before the exhibition is actually opened.

ORIGIN OF THE CHESTER ROWS.

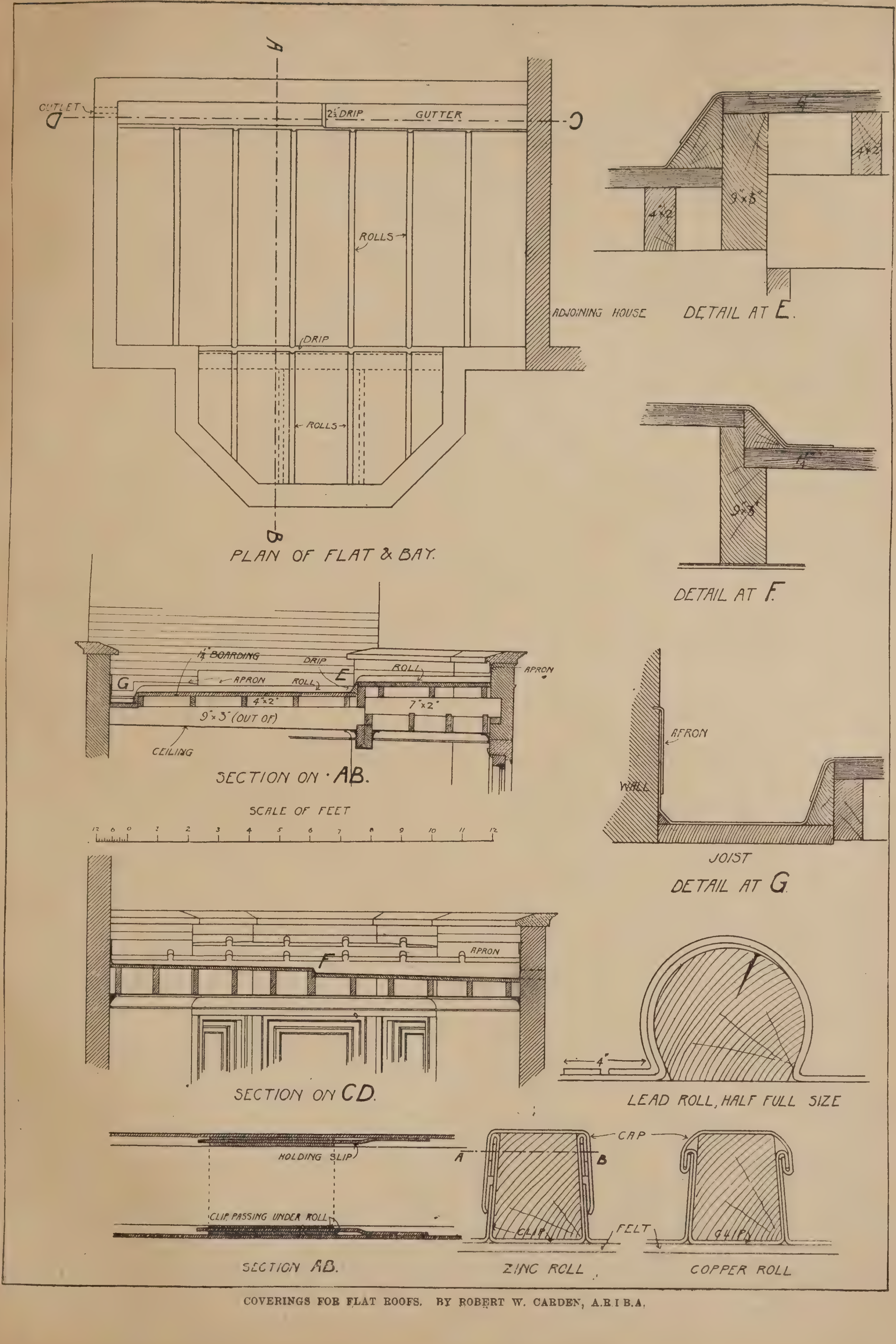
Under the auspices of the Chester and North Wales Archæological and Historic Society a lecture was recently given by Mr. H. D. Harrod, F.S.A., on the origin of the Chester "Rows." The generally-received explanation of the Rows in former times was that the original ground-level of the city was the same level with the Rows, and that the streets were cut out from this level 16ft. to 20ft. down into the solid rock. Researches had clearly proved, however, that the roadway represented the original ground-level, and that the Rows were artificially raised above that level. The foundations of the Roman buildings corresponded with the height of the roadway, and the Rows themselves were raised above that level by the accumulations of centuries. After dealing with many of the theories extant, the lecturer went on to say that the four principal streets in which the Rows were situated were without doubt the four main streets of ancient Roman Chester. Roman remains amply proved that not only the lines but the actual breadth of the roadway was identical. As, of course, the Rows did not exist in Roman Chester, or indeed until centuries after it had disappeared, why should it happen that they were only to be found within that area? There must have been some feature of the Roman Chester which was the germ from which the Rows were subsequently evolved. The second point was that the construction of the houses over the Rows was comparatively modern. In the old prints many of the houses did not project, but had a sloping roof that covered the Row and afforded protection to foot passengers. Accommodation for living in the Middle Ages was meagre, and the covering-in of the pent-house front by enlarging the house to the roadway was a tendency of later times which had gradually been taken full advantage of. The third point of importance was the fact that the shops in the street were, and always had been, for the most part in different ownership to the shops and houses behind them. The cases in which the shops in front were in the same ownership as the shops behind were exceptional and could be easily accounted for. The name "selda" which was applied to these shops in the old deeds denoted a stall or shed. From the position of the remains that had been unearthed it was clear that the Roman buildings were built flush with the present line of the streets, with steps leading from the street to an ambulatory or covered way under the roof of the main building. They had then in Roman Chester the four principal streets of much the same width as at present, lined with stately buildings colonnaded, and with steps leading from the roadway. They could imagine then that in Roman Chester there existed the threefold ownership—first the proprietor of the house, then the shopkeeper, who held a shop between the private house and the ambulatory, and lastly the stall holder, who placed his stall on market days on the steps. In London to-day, by long usage, the costermongers claimed a prescriptive right to a position at the roadside. In the course of centuries the general height of the ground-level was raised considerably by the ruins of the old buildings and the waste and rubbish of ages. On the sites of the old houses were erected wooden structures for shops and dwelling-houses. These shops were merely stalls with a projecting roof, probably extending partially over the pathway, affording a shelter to the purchasers who stood outside on the footway and made their bargains with the shopkeeper through the open window. As trade revived the old influx set in on market days. The countrymen found the streets all too narrow for their purpose, and took their stand on the bank at the roadside. The shopkeeper of Roman times had his shop in the ambulatory; the countryman or journeyman sold his wares on the steps in front. The shopkeeper of Norman times built his wooden shops on the ruins of the old buildings, and before him on the bankside the huckster of his day sold his wares; just as in Roman times ample room would be left for access to the upper pathway between the temporary stalls on the bankside. Many, no doubt, erected for the day some booth or rough shed, such as were set up in the market on market days. In process of time these would be left in position. The origin of the Rows, then, must be sought for in ancient Chester. The shop of the ambulatory with its covered way was perpetuated in the shop in the Row. The stall for traders on the steps found its lineal descendants in the shop in the streets. The covering over the Row had given way before the growth of the houses to the front, economising space and affording better living accommodation. Without any great revolution in design or architecture, the Rows had developed by a natural growth on the lines of the ancient design of Roman Chester.

COVERINGS FOR FLAT ROOFS.

By ROBERT W. CARDEN, A.R.I.B.A.

Flat roofs are generally covered with lead, zinc, or copper, but of late years asphalt seems to have found much favour, especially in large towns, where almost the whole of the available ground area is built upon, as a means of supplying drying grounds for workmen's dwellings and buildings of that class. Where this is the case the construction usually employed does not differ greatly from that of an ordinary fireproof floor, except that it is covered with a layer of asphalt and laid to fall to gutters. Only the natural asphalt should be used, as the artificial kinds are apt to be affected by the rays of the sun in summer and generally become soft during at least four months of the year.

The methods of laying lead, zinc and copper upon flat roofs are similar in main points, for each metal is liable to contraction and expansion with the variations of temperature, and in each case "free ends" have to be allowed to prevent cracks and other damage. Each should be laid upon grooved and tongued boarding running in the direction of the fall, cross battens being laid upon the joists where necessary (as shown in the accompanying illustrations). In each case, too, there should be a fall of at least $2\frac{1}{2}$in. in 10ft., and drips should be contrived longitudinally so as to break the metal sheets into strips about 7ft. or 8ft. long. The distance apart of the rolls will depend mainly upon the width of the sheets of metal used and will vary from 2ft. to 3ft., centre to centre. The shape of the rolls and method of forming them is the main point of difference between the three metals; it is shown drawn to one-half full size for purposes of comparison. The lead rolls are the most easily formed, but are coarser in appearance than the others. Copper rolls are the neatest and are fairly easily worked, but the metal is too expensive for common use. There is a little difficulty in the formation of satisfactory zinc rolls, for this material does not lend itself well to bending at sharp angles; so that instead of folding the capping-piece into the clip, two small holding slips have to be soldered to the sides of the capping (as shown), and the whole thing slipped up into its place until the holding slips are in the turn-down of the clip. As regards weight, lead is the heaviest, as it should not be less than 7lbs. per foot superficial, or about $\frac{1}{8}$in. thick. A sheet of copper of equal durability only weighs 1lb. per foot superficial, and zinc for the same purpose need not weigh more than $1\frac{1}{2}$lbs. per foot, though these latter, on account of their thinness, require to be laid upon roofing felt, otherwise they are liable to be cracked through the warping of the boarding underneath. Where drips are formed they should never be less than $2\frac{1}{2}$in. deep, and the angle blocked out with a fillet of wood so as to avoid sharp bends in the metal. The horizontal portion of the undercloak should be let into the woodwork so as to avoid a ridge where the overcloak covers it. Lead aprons and flashing need not weigh more than 5 lbs. per foot superficial, but those of zinc or copper should be of the same thickness as the sheets used for the general work. Where a flat roof abuts against a wall the metal should be turned up, and an apron wedged into the joints of the brickwork, and turned down over the top of the turned-up portion.



PLAN OF FLAT & BAY.

DETAIL AT E.

DETAIL AT F.

SECTION ON · AB.

DETAIL AT G.

SECTION ON CD.

LEAD ROLL, HALF FULL SIZE

SECTION AB.

ZINC ROLL

COPPER ROLL

COVERINGS FOR FLAT ROOFS. BY ROBERT W. CARDEN, A.R.I.B.A.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Re-slating Roof in Exposed Position.

LLANDDAROF.—WELSHMAN writes: "My house is in a very exposed position, and during storms the slates are continually coming off. The present slates are 24in. by 12in. and I intend to remove them and cut them to 20in. by 12in. Which would be the best method of re-slating, as I want to make a secure job of it? Which is the best way to fix a single slate when it has become detached from the roof, without having to strip the roof to get at it?"

The cause of failure in your case may be one (or more than one) of several:—Can the wind get under the slates at the verges more than is unavoidable on account of the exposed position? Are the slates top nailed and therefore subject to undue leverage in a storm? Is the slope of the roof very steep, so that the slates more or less depend for security merely upon their hang on the nails? I have known cases where composition slate nails gradually crept out of a roof of steep Gothic pitch until, when the slate at last fell, the shank of the still perfectly sound nail was parallel to the head instead of at right angles to it. Are the nails perished? Is the roof of board or is it battened merely? Have the slates sufficient lap? I would suggest re-slating upon $\frac{7}{8}$-in. rough boards; slate battens may, if desired, be used on top of the boards, but it is not necessary, though such a method of construction tends to equalise the temperature inside the house. To also secure an equable temperature and to render the roof proof against driving snow, inodorous felt should be laid on the boards before slating. Close slate with small slates (cutting your 24in. by 12in. is not a bad idea) and centre nail each with two nails. Copper nails, though expensive, are most durable and are usually $1\frac{3}{4}$in. or 2in. long. Failing copper I prefer iron "wire" nails rather than composition ones. Lay the slates with a lap of not more than 3in., and provide proper tilting fillet along the eaves to keep the wind from entering at so vulnerable a point. The eaves and margins should all be double slated and the ridge should be a heavy one. It is always unsatisfactory to replace a single slate which has slipped out of place, but the best way is to secure it by copper strips about $\frac{3}{4}$in. wide and about 6in. long bent in such a way that, when nailed (through the slate below) on to the roof, the lower end will receive the tail of the slipped slate. Lead strips are often used for the purpose, but are liable to be affected by the heat of the sun, and if partly undoubled may be rendered useless by snow sliding down the roof. G. S. M.

Qualifications of Instructor in Architecture.

PAISLEY.—QUERIST writes: "What are the necessary qualifications for a teacher in architecture to be recognised by the Science and Art Department? Is it necessary that he should hold an Art Master's or Art Class Teacher's certificate, or is there a recognised qualification for architecture alone?"

There is no special qualification for architecture alone. Anyone holding an Art Class Teacher's certificate may teach it and all other subjects of the "art" side of the department; but it is necessary to possess the Art Master's certificate before becoming the headmaster of an art school. G. A. T. M.

Theoretical Mechanics.

HULL.—J. T. writes: "Is theoretical mechanics of much use to an architect? What subjects should I take in addition to building construction preparatory to the work of an architect?"

Theoretical mechanics, although only an elementary acquaintance of the subject is required by the R.I.B.A. in its examinations, should be studied by the architect as much as by the engineer so far as the general principles are concerned. It is true that great works of architecture were carried out in the past without theoretical knowledge, but then it was made up for by the practical experience of the many craftsmen engaged in building. But this does not argue that an architect can afford to do the same nowadays: the workmen are now almost ignorant. Architecture is a science as well as an art. The engineer has already displaced the architect to a large extent, and unless the latter brings himself in line with the needs of the present day he will degenerate into a mere applier of ornament. If anyone is desirous of becoming an architect he should first see that he has a good general education and has an aptitude for the work. The following should then be studied, and understood:—Building construction, strength of materials and their properties, geometrical drawing, elements of perspective, freehand drawing, and planning. To inculcate beauty of proportion in mass, graphic design and colour study Nature and the reason of her forms—her architecture as it might be called. It need not be supposed that this course of study is so thorough that it would leave no time for practical work, for at present much time is wasted in studying quantity surveying, surveying and other such subjects that should be left to those who make them their special businesses. If you are to succeed you must have that enthusiasm that will keep you ever learning. H. K. D.

Size of Gas-pipes.

NEWCASTLE-ON-TYNE.—A. R. writes: "According to the table of diameters of gas service pipes given in Hurst, to supply two lights requires a $\frac{1}{4}$in. pipe; six lights, $\frac{3}{8}$in. pipe; and twelve lights, $\frac{1}{2}$in. pipe. Does this mean that a $\frac{3}{8}$in. pipe is supposed to supply no more than six lights, or that it will supply from six to eleven lights? If the latter, then a $\frac{1}{4}$in. pipe would supply five lights."

The meaning is that as a $\frac{1}{4}$in. pipe will only supply two lights, the next size, or $\frac{3}{8}$in., will be required for any greater number up to six; and for any number between six and twelve a $\frac{1}{2}$in. pipe will be necessary. HENRY ADAMS.

Books on Gas Manufacture.

LEWISHAM.—S. D. T. writes: "Kindly mention the name and publisher of a concise book on the erection and working of gas plant."

Messrs. E. and F. N. Spon, Limited, of 125 Strand, publish a book on "Gas Works: their Arrangement, Construction, Plant and Machinery," by F. Colyer, M.Inst.C.E., price 12s. 6d. Messrs. Crosby, Lockwood and Son, of 7 Stationers' Hall Court, E.C., published a book on "The Construction of Gas Works," by S. Hughes, C.E., enlarged by W. Richards, C.E., price 5s. 6d.

Portland Cement.

EDINBURGH.—D. K. writes: "(1) Does mixing Roman cement with Portland cement increase the strength of the latter? (2) What is the latest method of making Portland cement in England and America? (3) Is Portland cement imported here; if so, where from? (4) Who are the best makers, foreign or English? (5) Who are the best English makers?"

(1) The admixture of Roman cement to Portland cement decreases the strength of the latter. Roman cement is sometimes added to hasten the setting of Portland cement, and also for jerry work where cheapness is the first consideration. (2) During the last decade several new methods and new machinery have been introduced by English manufacturers for improving and cheapening various parts of the process for converting the raw materials, chalk and clay, into the finished cement; so that it is difficult to definitely state which is the latest method, taken as a whole. The most important and latest improvement in cement manufacture is the rotatory process together with the use of oil as a substitute for producer-gas. Mr. G. L. Anderson, manager of the London Portland Cement Company, Northfleet, has introduced several German improvements and is also the inventor of other improvements in the manufacture of Portland cement. With regard to the latest American methods, the new works of the Nazareth Portland Cement Company at Nazareth, Pa., may be cited as one of the latest, if not quite the latest. When the plant was first constructed, an attempt was made to utilise the heat in the gases from rotatory kilns for generating steam in the boilers of the power plant. The gases from each kiln were led to a vertical boiler, which could also be fired with coal on an ordinary grate if the demand for steam required it. A chimney carried off the gases from each boiler. When the plant was put in operation, trouble with the draught was encountered, so the capacity of the kilns for burning clinker was greatly reduced. This was due to the fact that when the grates were fired with sufficient coal to work the boilers at the requisite pressure, a certain amount of back pressure was set up, which naturally retarded its own fire. It was then decided to give up the attempt to utilise the heat from the kilns, and to substitute coal in place of oil as a fuel for them. The Nazareth works have seven rotatory kilns, giving the plant a capacity of 1,000 barrels a day. The Atlas Cement Company, Pennsylvania, has the largest and most complete installation of rotatory kilns in America, if not in the world. There are over 50 kilns in operation and the output approaches 12,000 tons per week. (3) Portland cement is imported to England from Germany and Belgium. (4) For general soundness and uniformity of quality no foreign cement equals the best brands of English Portland cement. (5) Having regard to the fact that the majority of Portland cement manufacturers are now combined under the title of the Associated Portland Cement Manufacturers (1900), Limited, it would be difficult, not to say invidious, to state who are the best English manufacturers. WILLIAM MILLAR.

Paving for Brewery Floors.

DERBY.—C. B. S. writes: "What is the most suitable paving for brewery floors? I want something which will withstand the action of the acid in the barm and other substances connected with brewing."

I should recommend either patent Victoria stone slabs or adamant paving slabs, laid on a 4-in. bed of concrete, as they are strong, durable, impervious and well able to withstand the action of acids, &c., as well as any heavy blows by the fall of casks, &c., if the stone is on concrete. W. H. M.

Oak Shingles for Roofs.

PETERSFIELD.—A TILER writes: "Where may wood shingles be obtained? Are they fixed in the same way as tiles, and what are their dimensions and thickness? Do they warp?"

Having occasion to re-shingle the spire of Merton Church in 1895, the architect, Mr. H. G. Quartermain, experienced considerable difficulty in finding a man to do the work. It was eventually undertaken by Mr. Charles Bassett, church spire shingler, of Wadhurst, Sussex, who had just previously done Wimbledon Church, where he used no scaffolding except some ladders. At Merton, which has a low spire, he had a ladder, but worked from a cradle slung up to the vane, and he was served by one labourer. The old shingles had lasted for just one hundred years. Warping always occurs more or less, but generally less, as the shingles are *split* oak, 4in. by 12in. by $\frac{1}{2}$in., nailed with 2in. *copper* nails to a 4in. gauge, like tiles. G. A. T. M.

Gothic for R.I.B.A. Testimonies of Study.

YEOVIL.—PERPLEXED writes: "Which is the best book from which to draw the Gothic carving sheet (No. 6) for the Testimonies of Study, R.I.B.A. Intermediate Examination? Should one example be drawn to a large scale, or several small ones? How much is expected in the written memoranda? Should this be a description of the example from which the drawing is made or of the style generally which it illustrates?"

If the drawing be copied, Collings' "Gothic Ornament" is the best book to take it from; but it ought to be done direct from the actual stone or wood. Good examples of Gothic enrichment in bench ends, capitals, &c., are to be found in almost every country church in England, so that there should be no difficulty in selecting something suitable for the purpose. Only one example is necessary, and it should be drawn not smaller than half full-size—full-size is better. The written description should refer mainly to the object itself, its date, style and use; but a short account may well be added of the building in which it occurs, illustrated by a sketch plan on which the position of the object should be indicated.

G. A. T. M.

Period of Years' Purchase.

BRISTOL.—SURVEYOR writes: "Do the arbitration or other courts lay down any *fixed* number of years' purchase for the compulsory sale of freehold ground rents; and, if so, how many years' purchase? If there is no *fixed* rule, what is the usual number of years' purchase allowed? Would 10 per cent. for compulsory sale be allowed in addition?"

[The above query appeared on page 82 of our issue for March 6th last. The following is a further reply to it.]

A usual scale of value for freehold ground rents is:

3 per cent. (33⅓ years' purchase) for very well secured ground rents;

4 per cent. (25 years' purchase) for fairly well secured ground rents;

5 per cent. (20 years' purchase) for unsecured ground rents;

their locality and the special conditions of each case causing however a good deal of variation from this scale. Ten per cent. is a very usual addition for compulsory sale. G. S. M.

Shop Fittings.

HEATON MOOR.—SEB writes: "Kindly name a good book on shop fittings."

We are not aware of any good work on the subject.

Supply of Scantlings.

SALISBURY.—A. X. writes: "Having several farm buildings in course of erection, I find the timber supplied by the contractor (especially 4in. by 2in.) of an inferior quality, and anything but free from sap. I am told that it cannot be obtained any better without being cut out of, say, 8in. by 2in., the reason given being that the forests are running short, and the 4in. by 2in. scantlings are cut out of the very smallest timber. Is there any truth in this statement?"

This question may to some extent be answered by reference to Dr. W. Schlich's lecture before the Society of Arts, as briefly reported in the BUILDERS' JOURNAL of March 6th last (page 84). There is no doubt that the increased cost of freight and the increased distance from the Baltic seaboard of exploitable timber of good quality has caused a large quantity of small trees of immature growth and inferior quality (for which years ago there was no need owing to the ease with which larger trees could be obtained) to be put on the market—a state of affairs which no doubt will rather tend to become more accentuated than otherwise as time goes on. That small scantlings of good quality can still be procured there is no doubt, but the cost is much greater than formerly, because trees producing that quality of wood amount to more money if converted into the largest scantlings possible, and should the English builder want high-class timber he must be content to have it cut out of baulk—especially if he needs it in long lengths. The following comparison of prices paid by myself at a station about twenty miles from a port may be of interest:—

	August 1898.	June 1900.
3in. by 2in. red deal 4in. by 2in. " " 5in. by 2in. " "	1s. 3½d.	1s. 5d. per ft. cube.
9in. by 3in. " "	4½d.	5¾d. per ft. run.

the quality in each case being identical. In both years the 5in. by 2in. was for rafters in lengths of from 18ft. to 20ft. G. S. M.

Mr. William Charles de Boinville, architect, of Plymouth, met his death recently by a street accident.

THE ÆSTHETIC TREATMENT OF BRIDGES.

AT a meeting of the Institution of Civil Engineers held on March 12th a paper was read by Mr. Joseph Husband, A M.Inst.C.E. It was devoted to the consideration of the æsthetic appearance of bridge structures in general, as resulting from various methods of treatment in design. The opening portion had reference to some fundamental laws of æsthetics which it was desirable to observe in general design, at the same time pointing out the connection between æsthetic and economic treatment. The effects on æsthetic appearance of the necessity for rapid construction, choice of material, difficulties of site and magnitude of structure were noticed, together with the importance of making allowance for these in criticising completed works. Adverse criticism was shown to be frequently due to comparison with wrong or unsuitable standards, especially in the case of very large structures. The strong connection between true economy and æsthetics, as evidenced by natural examples, was next mentioned, and the relation of these to artificial structures was considered. General requirements, such as simplicity in design, proper employment of materials and choice of the most pleasing outline where option existed between two or more economical schemes, were noted, as well as the inadvisability of attempting to lay down rules for regulating æsthetic design. Some cases existed in which external ornament might be appropriately employed with economy, whilst many others were totally unsuited for such treatment and suffered detraction if it were followed; and again, abuse of ornament led to æsthetic failure.

Bridge structures in general were, for convenience of consideration, divided into three distinct classes—those built entirely of masonry, those constructed entirely of metal, and those in which masonry and metal both figured. These broadly corresponded to works of small span, large span and intermediate span respectively. The strong relation between masonry types and architecture was noticed, and the various features of the masonry bridge were considered in detail. The effect on the general appearance of different modes of treatment as applied to the arch-ring, spandrels, piers, abutments and parapet, was commented on, and several instances were cited in which the due observance of the primary laws of æsthetics improved the design without militating against economy. Criticism of masonry structures almost invariably reverted to comparison with architectural standards—often an unfair procedure. Several existing structures were referred to in illustration of the points considered.

The second class of structures, consisting of bridges constructed entirely of steel or iron, was sub-divided into representative types, each one being considered separately. Emphasis was laid on the necessity for employing a totally different standard of comparison in estimating the æsthetic value of such works, adverse criticism being frequently due to the neglect of this requirement. True æsthetic effect in these structures was due in a much greater degree to a correct observance of simple and economical design, and the adoption of the most pleasing outline consistent with other conditions, the use of applied ornament being almost æsthetically impossible and economically harmful. Several examples of cantilever, suspension and arched bridges were referred to and illustrated, as well as lofty viaducts carried on metal piers. The various features of each as affecting æsthetic appearance were noticed and cases were instanced in which special difficulties in the way of construction and site had prohibited the employment of a pleasing outline, whilst economy in design had still been preserved. The most recent examples of large bridge structures were cited wherever possible in demonstration of the points at issue. In dealing with the large-span arch, distinct varieties of outline were illustrated, and the relative merits of each were discussed from an æsthetic point of view. A short notice was devoted to the use of more or less ornate masonry towers in connection with the steel arched bridge.

In the third class of structures were considered large-span bridges having masonry piers of such magnitude as to exert a considerable effect on their æsthetic appearance, the most successful examples being those from which architectural ornament had been strictly excluded, and in which a simple but massive treatment had been followed in harmony with the dimensions of the superstructure. In this section were also treated the various types of girder bridges of smaller span, many of which, although possessing little claim to æsthetic value, might yet be rendered more pleasing in appearance by careful attention to several salient features in their design.

The paper concluded with a brief notice of the employment of cast-iron ornament in bridge structures, examples being quoted in which its adoption might be desirable, and others in which, by militating against economy, the fundamental principles of æsthetics were also violated. Instances of its eminently successful application were mentioned, and illustrations were supplied showing the comparative æsthetic effects of the use of cast-iron and steel in structural work.

LICHFIELD CATHEDRAL RESTORATION.

THE fabric of Lichfield Cathedral, after an expenditure of about £105,000, is now in substantial repair throughout, and according to the Dean (Dr. Luckock) all the wealth of statuary and ornamental work destroyed by the Parliamentarians during the siege has been renewed. Before 1892 £80,000 or more had been spent on the restoration. In that year the Dean and Chapter asked for £14,000 to complete all that was necessary to be done, but they have received no less than £24,000, of which nearly £9,000 was especially for sculpture and ornament. Since 1892 there have been three marked epochs in the work of reparation. In 1895 the Lady Chapel, with its seven large windows of splendid sixteenth-century Flemish glass, was enriched by two more of the same date and school, accidentally discovered; by a highly-decorated triptych carved by the peasants of Ober Ammergau; by ten alabaster statues of the virgin saints of the calendar; and many other rich ornaments, at a cost of £3,000. In 1897 the chapel of St. Chad, which had been destroyed in 1643, was fully restored, and all the windows were filled with stained glass at a cost of £1,200 given, by the Dean. The last epoch is the presentation of numerous very costly offerings, including 47 statues of stone and alabaster, bringing the number up to 200, and leaving not a single niche vacant within or without. No fewer than eighteen or twenty windows, some very large, have been lately filled with stained glass. Side by side with the development of the ornamental work the repair of the fabric has gone on uninterruptedly, and consumed as much as £15,000 in eight years. It is said that for the £2,000 collected for sculpture, &c., during the last year not a single person who was asked declined.

Surveying and Sanitary Notes.

Withernsea Improvements.—The Urban Council have decided to complete the purchase of Beech Cottages for £400, to be converted into Council offices, and to enter into negotiations for purchasing certain land for widening Queen Street South. Mr. J. Villiers, Beverley, is to be engaged to make a trial bore for the proposed water supply, and the clerk has been instructed to obtain contracts for the purchase of 10,000 square yards of land forming the Mere, and also for the purchase of the Withernsea Gardens, comprising 2½ acres. The surveyor will also prepare a plan of a proposed new road from north of the Chapel-of-Ease across the Swan Estate, to the Waxholme Road.

R. I. B. A.

MR. HARRISON TOWNSEND ON MOSAIC.

A MEETING of the Royal Institute of British Architects was held on Monday evening, Mr. William Emerson (the president) occupying the chair. Mr. Alexander Graham regretted to announce the death of Mr. Newton Edward Jennings, of Melbourne, Australia, who was elected a Fellow in 1867. The president said that in response to their request the King had been pleased to offer the Gold Medal in continuance of the favour granted by the late Queen. The president also drew attention to the fact that the Architects' Benevolent Society was badly in need of funds, and he appealed to members for contributions. Last year an appeal was made to 5,000 architects, but only 90 responded; this, in his opinion, did not reflect credit on the profession. Mr. J. Macvicar Anderson had given £50, and would increase his donation to £100, provided nine other gentlemen would do the same, so making up £1,000. About five gentlemen have since done this. Mr. J. H. Brewerton, of Bournemouth, was elected a Fellow. Mr. C. Harrison Townsend then delivered his lecture on "The Art of Pictorial Mosaic."

In introducing his subject, Mr. Townsend remarked on the paucity of published matter dealing with the history and practice of mosaic-work as a whole. M. Gerspach's "La Mosaïque" and Professor Middleton's short article in the "Encyclopædia Britannica" represented the only endeavours towards a general history or a comparative criticism of the art. For the purposes of the present paper he proposed to consider the subject from the period when Christianity claimed the aid of mosaic work. The earliest examples handed down to us are of the fourth century. Ciampini's theory that the Church of St. Costanza in Rome had been originally a temple of Bacchus was based on the nature of the ornament; but M. Müntz holds that the mosaics are of Christian origin, though under strong Pagan influence. A fragment of mosaic found in the cemetery of St. Callisto, Rome, and now in the Vatican, is apparently of the fourth century, and is interesting as being probably the earliest representation of the traditional features of Christ. The home of the martyrs Prudentiana and Prassede, consecrated by the Pope in the second century, was largely altered in the fourth to adapt it to the purposes of a church, when the very beautiful mosaic work, still existing though much restored, was executed on the vault of the apse. This work, which shows the high level to which mosaic art had attained in the fourth century, may be regarded as a compendium of the early or Roman manner, untinctured by the influence, later to be predominant, of the Greek canons and ideals. Constantine, after his removal of the seat of empire to Constantinople in 330 A.D., especially favoured the mosaic artist, and during his reign and that of his immediate successors a great number of churches in the eastern part of the Empire were beautified by this art. St. George's, Thessalonica, was cited. The mosaics in the Baptistery at Naples are of the fourth century, which closed under the growing influence and domination of the Eastern or Byzantine.

In the fifth century (*c.* 422 A.D.) the Empress Galla Placidia, widow of Constantine II., made Ravenna her seat, and it is to her that the city owes three of its treasures—the Baptistery of the Orthodox, the Chapel of the Archbishop, and the Mausoleum of the Empress herself. Describing and illustrating the mosaic work in these buildings, the lecturer drew attention to the pagan symbols introduced in the Christian subjects represented, and remarked on the distinctively Roman treatment of the forms depicted. The very beautiful work in the Mausoleum of Galla Placidia seems, with its absence of gloom yet its dignity of invention, its Roman forms yet its Christian thought, to form the typical example of the fusion of the new and the old creeds. Other examples of fifth-century work still existing were referred to—namely, those at St. Ambrogio, Milan, and St. Sabina, Rome, and the series of mosaics on the Triumphal Arch of St. Maria Maggiore. These latter are particularly important among the early works of Byzantine art and show the last effort for many centuries towards dramatic representation, before pictorial art became crystallised into conventional and traditional forms. The fairly precise reminiscences of the fifth century contained in the mosaic work of the Basilica of St. Paolo fuori le Mura, which retains the scheme of the original mosaics of Pope Leo I. (440-461), show how the earlier—the Roman—symbolism was passing away.

The sixth century is rich in material for study, in both the eastern and western portions of the Empire. The gorgeous mosaics at St. Sophia, Constantinople, completed under Justinian in 559, lay concealed for many centuries under coats of whitewash. But in 1847 and 1848 an opportunity of studying the Byzantine mosaics occurred, and Salzenburg made his well-known series of drawings of the old work. Judging from these, there seems to have been a consistent scheme of decoration, a general tone of harmonious quiet colour, with silver largely used for the high lights, and soft green or blue folds in the drapery, and throughout a feeling of the antique or Roman style as it began to be influenced by the sterner, more rigid canons of the East. Touching the present condition of the mosaics of St. Sophia, the lecturer stated that five years ago he examined, with the aid of strong glasses, the ceiling of the gallery, and came to the conclusion that the present whitewash serves as a substitute for now absolutely vanished mosaics! Mr. Townsend then passed to sixth-century mosaics at Ravenna, describing those at the Baptistery of the Arians, or St. Maria in Cosmedin; St. Apollinare Nuovo, built in 500 A.D. for the use of the unorthodox, and converted into a Roman Catholic church in 570, traces of both influences being present in its treatment; St. Vitale, built A.D. 526, and utilised as a model for St. Sophia, Constantinople; and St. Apollinare in Classe, still, for all its sadness of decay, a magnificent contribution to the history of the art. Regarding the art at Rome at this period, the dominance of the Northern races, after the accession of Theodoric in 493, had led to the selection of subjects appealing to and models selected from the strenuous and vigorous Northerner rather than the dreamy and ascetic Eastern. The work is characterised by freshness of treatment, but with a kind of grim hardness in the type of countenance selected—the Roman ideal at base, but with an all but barbaric respect for physical strength.

Seventh- and eighth-century examples—St. Agnese fuori le Mura and St. Theodore, Rome—were briefly described.

The achievements at Rome and Constantinople during the ninth century must be contemplated in the light of the great dispute of the preceding century as to the representation in religious subjects of the human or divine-in-human form, and the effect that the various Church rulings had exercised on Christian pictorial art. The result was to check the art along the particular lines affected, but to lead to a reaction during the following century, and the ultimate production of many great and important works. Works of the date referred to included the mosaic in the sanctuary of St. Ambrogio; the very beautiful and gorgeous mosaics of the Church of St. Prassede, Rome; and those at St. Marco and St. Cecilia, Rome.

From the second quarter of the ninth century till near the middle of the twelfth the art underwent in Rome a period of absolute stagnation. During this period, however, notable work was done at St. Mark's, Venice—work in which a Greek or Byzantine influence is manifest. At Torcello, in the twelfth century, a magnificent mosaic was placed on the apse ceiling.

The existence of a purely Sicilian school in Sicily is doubtful; it would rather seem that the Normans, under Roger II., called to their service Greek artists. There is much similarity of sentiment between the St. Mark's and the Sicilian work. Reference was made by the lecturer to work of the twelfth century carried out in the following buildings: La Martonara, Palermo; the Cappella Palatina; the Cathedral at Cefalù, in which the characteristics of Sicilian work and its affinity with that done at the same time in Venice, are evident; the Monastery of Daphne, near Athens; the Church of the Holy Sepulchre, Jerusalem; and the Church of the Nativity, Bethlehem.

In the Western world the twelfth century produced at Rome the apse of St. Maria in Trastevere, the character of the work still Roman rather than Greek or Byzantine; St. Francesca Romana, often ascribed to the ninth, but, as De Rossi maintains, really of the twelfth century—a very unusual and beautiful design; St. Clemente, Rome, dated by M. Gerspach as of the thirteenth century, but which Mr. Townsend placed as early in the twelfth, the work exhibiting a treatment rather apart from the usual *motifs* of Roman work.

In the thirteenth century the great scheme at St. John Lateran was executed for the Pope Nicholas IV. by the master-artist Jacopo di Torrita or Torriti, the design being signed by Jacopo and his worthy assistant, Cameroni.

The lecturer next discussed the mosaic decoration carried out in the same century in the Baptistery at Florence and in the Cathedral at Pisa, and the further prosecution in the thirteenth and fourteenth centuries of the mosaic scheme for St. Mark's, Venice.

Rome saw two important works achieved in the fourteenth century, of which perhaps the principal was the completion of the fine work in the apse of St. Maria Maggiore, commenced by Jacopo di Torriti, and of the panels below it executed by Gaddo Gaddi.

In the fifteenth century Baldovinetti executed one of the overdoor spaces at the Baptistery, Venice, and his pupil and Michel Angelo's master, Domenico Ghirlandajo, commenced in the cathedral the decoration of the Chapel of St. Zenobio. The really important work of this century occurs in the Chapel of the Mascoli in St. Mark's, Venice. These mosaics represent the principal legends of the Virgin, and in composition, colour and execution are alike admirable. It is with these panels that one approaches the end of the art of mosaic work; from this point one sees the mosaist, designer and executant in one, make room, to the ultimate destruction of his art, for the painter, who called to his aid the "dull mechanic" hand of a workman to represent servilely oil-painted pictures by means of cubes of glass

The state of design rapidly became worse and worse. The seventeenth and eighteenth centuries saw work accepted and praised which transgressed, in its realism, its exaggerated movement, its rendering of accidentals, all the rules and canons that should regulate mosaic work.

But it was reserved for the nineteenth century to strike the worse note of imitation, and not only to execute indifferent mosaics, but to falsify the history of the Church as recorded by and on its walls, by treating their mosaic designs as pseudo-thirteenth-century work.

The author concluded with some observations on recent mosaic art in England. It cannot be said that some of the works are successes, save as to execution. The artist seems unwilling to suppress, as the loyal mosaist should, many of the attributes of which, under other circumstances, he might justly be proud. The author expressed his conviction, however, that it would have been impossible to find in either France or Italy an artist who would have carried out work recently executed in England without falling still more egregiously into the errors which the great examples of the past showed to be present therein.

A discussion followed in which Mr. Walter Crane, Mr. C. Anning Bell, Mr. T. Spence, Mr. L. P. Crace, Lieut.-Col. Prendergast, and the President took part. In the course of his remarks Mr. Crane referred to the saying of William Morris that mosaic was like beer—a little of it was no good. It was useless to apply it on a building in snippets. He hoped that mosaic would be much more commonly used in the future.

Masters and Men.

The Kirkcaldy Building Trade.—The local Society of Operative Masons have received intimation from the Masters' Association that they intend to reduce the wages from 8½d. to 8d. per hour, commencing at the end of May. The Society have unanimously agreed not to accept the reduction, as they believe the state of trade in the district does not warrant it, seeing ½d. per hour had been taken off the wages last year. The operative joiners also have received notice of a reduction from 8d. to 7½d. per hour. They also have decided not to accept the reduction. Notices have been posted at most of the buildings of a reduction of the bricklayers' wages from 9½d. to 9d. per hour.

The Amalgamated Society of Carpenters and Joiners in its monthly report affords evidence of the lessening activity in the building and allied trades in a further increase of the unemployed list. There are now 3,127 members on out-of-work donation out of a total roll of 65,529, representing 4¾ per cent. with 1,654 on sick benefit. In the Manchester district, out of 3,103 members, 180 are on the unemployed list, which is about 6 per cent., as compared with 5 per cent. a month back, and trade locally is described as "bad." Proposed reductions in wages have been abandoned in Glasgow and Dundee, and the notices have been withdrawn; but the dispute at Belfast is still unsettled.

The Norwich Bricklayers' Strike still continues. The Norwich Master Builders' Association are in receipt of no fewer than three further demands for higher wages. The Amalgamated Society of Carpenters have given notice for an advance of a ½d. an hour and a proportionate increase for overtime, to take effect on June 1st 1901. The Navvies, Builders' Labourers and General Labourers' Union are asking also for a ½d. advance, to take effect on June 1st, and the Amalgamated Society of House Decorators and Painters demand an increase of 1½d. an hour, the present rate being 6d., and various alterations of the rules which would, if granted, bring about a reduction of working hours, and would transfer to the painting trade all whitewashing and distempering done with hair brushes.

The Great Building Trades Strike at Chicago terminated recently. The strike had lasted a year, and originated in the excessive demands of an organisation known as the Building Trades Council, a federation of the different building trades unions. Sympathetic strikes were the means by which the decisions of this council were enforced. Apprentices were absolutely abolished, and the entrance-fees into the unions raised to such a point as to practically bar the admission of new members, and no non-unionist was permitted to work. The abolition of stone-cutting machinery was decreed, and the most rigid rules adopted as to the demarcation of work and as to limitation of output, the amount any man might do per day being strictly defined by various schedules, the result being a reduction of about half the amount previously done. Strikes extending to all the trades were declared on the most trivial pretexts. The different contractors of the city formed a federation and framed a set of rules themselves, under which only would they consent to engage a workman. These rules contended that there should be no limitations on output, nor restriction on the use of machinery, nor on the use of goods save those originating in prisons. No interference with workmen by outside parties during working hours was to be permitted, nor were apprentices to be prohibited. Perfect freedom in the engagement and dismissal of men was also claimed. These conditions were rejected by the Trades Council, and the strike commenced on February 5th, 1900. In its earlier stages it was marked by a great display of violence on the part of the strikers. The employers have now gained a complete victory. For skilled labour the wages range from 16s. 8d. down to 12s. 6d. per day, whilst labourers are paid from 10s. down to 8s. 4d. per day.

Professional Practice.

Beeston, Nottingham.—The foundation stones of a new Wesleyan church were laid last week. The premises comprise a church with nave, transept and choir gallery, and a school in the rear portion of the site. In the church, which has a gallery round three sides, there is accommodation for about 750 persons. Ample vestry accommodation is provided for the minister, choir, &c. The organ will be placed behind the choir gallery and the rostrum in front. The school premises consist of a large assembly room, an infants' school, an adults' class-room, a ladies' room, and seven class-rooms, which are grouped round the large room and open out of it. The exterior, designed in the Decorated Gothic style, is of pressed bricks with facings and tracery windows of rich design in stone. The entrance front faces Chilwell Road and at the south-west corner is placed a tower and spire rising to a height of about 100ft. The interior woodwork of the roof and pews is pitch pine, the roof being waggon-headed in shape. The tracery windows will be filled with ornamental tinted leaded lights. The cost of the entire building will be about £7,000, and the church portion is at present in course of erection. The architect is Mr. W. J. Morley, F.R.I.B.A., of Bradford and Harrogate.

Horfield, Bristol.—A new Franciscan Church of St. Bonaventure has been erected on a site adjoining the Friary at a cost of about £4,000. The design is Early English in style, and consists of a nave, chancel, side chapels, aisles, baptistery, confessionals, a choir at the west end, and another choir for the friars over the chapel on the Gospel side, pierced with arched openings into the chancel. The nave consists of five bays. The bays at the west end are flanked by the tower on the Apostle side, and by the baptistery on the Gospel side. The nave is divided from the aisles by an arcading supporting the main principals of the roof, which has a span of 48ft., and cover both nave and aisles. The arches of the nave are over 30ft. high, and are striking features of the church. The chancel is divided from the nave by an arch 37ft. in height, and is lit by three lancet windows in the bay of the aisles. The confessionals are placed on the Gospel side of the church, with openings formed through the aisle wall. The west end of the nave is pierced with three lancet windows. The entrance door is in the centre of the nave wall, and there is a smaller door in the tower, opening into the porch. The organ chamber is approached by circular stairs, built at an angle of the tower. The baptistery is apsidal in form, and is lighted by a lancet window in each bay. The tower, baptistery, and west-end bay were not included in the contract for £3 800. The total length of the church is 90ft., the width of the nave being 22ft., the width across the church 48ft., and the height from floor to roof 50ft. The church is built of rubble stone with Bath stone dressings, and facings of blue stone. It will accommodate about 350 persons. It was designed by Messrs. Pugin and Pugin, including the Friary. The contractors were Messrs. R. W. Wilkins and Sons, of Bristol, and Brother Patrick acted as clerk of works.

Kirkdale, Liverpool.—A new Baptist Church is being erected at the corner of Walton Lane, Fountains Road, and Barry Street, directly facing the Anfield Road entrance to Stanley Park. The buildings, which are designed in Classic style, freely treated, will consist when completed of a large basement schoolroom, 49ft. by 45ft., with accommodation for 400 persons. On the same floor there will be five spacious classrooms and conveniences, with two staircases. The whole of the basement will be well lighted, the chapel being raised considerably above the surrounding footwalk. The schools will be approached by two flights of stone steps, six feet wide, from Fountains Road and Barry Street, and the whole of this floor will be laid with pitch pine wood blocks. The ground floor consists of a chapel, 54ft. by 43ft., with large side transepts, and deep recess in back gable for pulpit, and will have accommodation for 400 adults. On this floor there are to be two large vestries. The main entrances to the chapel are from Walton Lane and Fountains Road, and lead into large entrances containing the gallery staircases, and then to a vestibule before entering the chapel. The gallery, which is situated on three sides of the chapel, will provide seating accommodation for 316 persons. The side galleries will have two rows of pews, and the end gallery and transepts seven and eight respectively. The pulpit will be placed in the chancel, with the baptistery immediately in front. The main front of the chapel will face Walton Lane, with a main gable flanked on each side with staircase wings and porches. The three principal elevations will be carried out in red-pressed Accrington brick, with Cefn stone dressings. The whole of the building will be heated with a low pressure system of hot water. The building is to be lighted throughout with electricity. The total cost, exclusive of land, is about £5,000, and the contractors are Messrs. Hough and Pilling, of Liverpool, and the architects Messrs. Richard Owen and Son, Crosshall Street, Liverpool.

Portsmouth.—A new drill hall has been erected in Stanhope Road for the 3rd (Duke of Connaught's Own) Volunteer Battalion the Hampshire Regiment. The site was given by the Admiralty authorities in exchange for the old one. The cost of erecting the new building has also been paid by the Admiralty. The principal frontage is to Stanhope Road. The material is dark red brick with Bath stone dressings. There are a large square tower, with a miniature tower on it, over the main entrance, and castellated towers at three angles of the building, and a small circular tower at the Edinburgh Road corner. The building consists of a large hall space, round which are grouped the various offices. The central hall itself measures 144ft. by 118ft., the height to apex of the roof is 68ft., while the distance from the ground line to the eaves is 33ft. There is a smaller hall, measuring 76ft. by 44ft. The roof of the great hall is of wrought iron lattice girders, springing from below the ground line, the feet being bolted down to blocks of concrete. These span the great hall completely, and on them are fixed the purlins and rafters, &c., relieving the walls of the weight and strain of the roof, and leaving a clear floor space. The contract for the roof was carried out by Messrs. Andrew Handysides and Co., Limited, of Derby. The floor has been laid with tar paving by Messrs. Bradshaw, of Southsea. The walls have been coloured with Aspinall's water paint. The hall is lighted by large windows, but for evenings eight arc lamps will be used. The smaller hall is fitted up as a gymnasium, and is also used as a recruits' drill room. The floor is of Ebner's pitch pine blocks, laid diagonally. On the first and second floor levels are two balconies, partly surrounding the great hall, and approached by stairs from each end of the hall. The upper balcony gives access to the officers' mess-room, which is divided into two rooms by means of a folding partition, the smaller one being furnished and fitted up as an ante-room, and the larger forming a dining hall. A dressing-room and lavatory for officers adjoin, while above this, in the tower, is an extensive kitchen, with lift, and on the floor beneath is a scullery. From the kitchen a ladder leads up to the roof of the tower, nearly 100ft. above the ground level. The lower balcony, which extends along one side, and partly along the two ends of the great hall, is devoted to the offices. Here is the sergeants' mess, measuring 60ft. by 26ft. Adjoining the mess is a large room, which has been let to the Portsmouth troop of the Hampshire Yeomanry (Carabineers). The quartermaster's store and office, and a committee room, are to be found on this floor, while there is also an entrance to the caretaker's apartments, which are comfortable and convenient. Below this suite of rooms and on the ground floor are other offices, &c. An armoury occupies the central space on this side, and close to it there is a small magazine for holding the spare ammunition. It is specially built, and protected by an iron door. The commanding officer's room and the orderly-room lead from it. There is a machine-gun room, capable of holding two or three of these guns, in addition to the harness used for the battalion transport; a band room, and several stores, besides lavatories. In the corner are the junior non-commissioned officers' club room and the canteen and men's recreation room. All the rooms are decorated in the same style—pink walls, with a dark terra-cotta dado with lighter filling, and a pale brick red frieze. All the paint work is executed in two greens—one considerably darker than the other, with the sole exception of the officers' mess. The wood work of the latter is in teak. The entire building is fitted with electric light, the whole of the fittings having been executed by Messrs. Pyke, Harris, and Co., of Westminster. The plans were prepared by Major A. H. Bone, of Cambridge Junction, Portsmouth; the builder was Mr. J. Crockerell, of Victoria Road North, Southsea; and Mr. G. Felton Lancaster has been the clerk of works.

St. Helens.—The new Grange Park Hotel has been erected for Messrs. Greenall, Whitley and Co., in Sandy Lane. The building is in the Late Domestic English style, the front being of Ruabon brick with stone dressings. The roof is covered with red tiles, with overhanging eaves. The house is divided into two parts for first and second-class customers. The main entrance to the first-class side is from Sandy Lane. This leads into a large hall, the floor of which is laid in mosaic, with a deep mahogany dado and a ceiling of fibrous plaster. To the left is a commodious smoke-room with upholstered seats and mahogany fittings. Behind that is the dining-room, and on the left again the billiard-room with lavatories, &c. It is lighted from the top by a large lantern light. The bar is in the centre of the house. The entrance into the second-class portion is from a side street and consists of a large bar and smoke-room, with separate lavatory accommodation. The kitchen and domestic offices are at the back and cut off from the remainder of the house. On the first floor is situated a large club-room with a richly-panelled ceiling. The remainder of the floor is occupied by bedrooms, a bathroom, lavatories, &c. On the second floor there are six bedrooms and a boxroom. Outside the hotel there is a four-stall stable, coach house, and bicycle shed. The gas brackets are all fitted with self-lighting arrangements, the tap which turns the gas on also setting it alight. Mr. F. S. Biram, Hardshaw Street, was the architect, and Mr. John Lucas, Prescot, builder. The joiner's work was done by Mr. Halsall, Prescot, and the plumbing, glazing and painting by Messrs. McNelly and Co., St. Helens. Mr. A. Hawksey did the upholstering.

South Tottenham.—A Home for Jewish Incurables has been erected in the High Road, South Tottenham, from plans of Messrs. H. H. and M. E. Collins, of 61 Old Broad Street, who were selected in open competition by Mr. W. Flockhart, of 180 Old Bond Street, the assessor. The contractor was Mr. William Downs, of Hampton Street, Walworth. The building is in the Elizabethan style, and is so placed on the site as to afford the maximum amount of sunshine to the patients. The frontage extends to about 204ft., and whilst visitors enter the main building by steps, gradual slopes have been arranged so that the invalid chairs of the patients may be easily wheeled up them. The building is constructed of red brick and stone, surmounted by red terra-cotta chimneys, and is approached through a garden. The corridors are broad—that approaching the entrance hall being 10ft. in width. Near the entrance hall is the entertainment room, about 47ft. by 28ft. Communicating with this is the office of the secretary. On the ground floor there are—besides the matron's room—four large dormitories, each destined to contain six beds at present, but capable of accommodating double that number, two single bedrooms for special cases, two sitting-rooms, each 29ft. by 25ft., with large bay windows carried down to the floor. Attached to the sitting-rooms is a serving-room and a linen and store room. The rooms are heated by special fireplaces (Teale's patent), which permit of a fire burning for a lengthened period without interference. All sanitary fittings are in a disconnected annexe. The first floor is practically a replica of the ground floor. On this floor are also the matron's bedroom, bath room, &c. On the second floor are the rooms of the nursing staff, consisting of four dormitories and a sitting room. The servants' quarters consist of servants' hall, six men's and women's dormitories, lavatories, and bathrooms. The latter are specially constructed, the baths being partially sunk in the floor, so that paralysed patients can be easily lifted therefrom. The kitchen, 28ft. by 25ft., is at the top of the building, scullery, store and service rooms, all lined with white tiles, being attached. In connection with the kitchen are two lifts for conveying food to the service rooms. Each floor can be reached by means of two stone staircases, in addition to which a special lift for patients is provided, as also a lift for domestic purposes. The building has been so arranged that eventual enlargement is possible. The builder, Mr. Downs, contracted to construct the building for £27,000, and to hand it over to the charity completed and fit for habitation for that sum. This has been achieved without a single extra. The gardens of about three acres will be laid out in lawns and shrubberies by Messrs. Veitch, of Chelsea, and are overlooked by a covered verandah.

Keystones.

A new Church for St. John's District, High Wycombe, is to be erected at a cost of £6,000.

An Oxford Memorial to the Queen.—The little town of Watlington proposes to perpetuate the late Queen's memory by a new lych-gate at the entrance to the churchyard at an estimated cost of £250.

Chinese Exhibition, 1903.—A syndicate is in process of formation for the purpose of holding an exhibition in London in the summer of 1903 of the industries, arts, and sciences of the Chinese Empire at Olympia, Kensington.

A New Cottage Hospital at St. Andrews is to be erected at the easternmost portion of Abbey Park. Mr. Charles F. Anderson, architect, of St. Andrews, is preparing the plans. The accommodation will include two male wards, two female wards, and a children's ward, the total number of beds, including cots, being 18.

Burnham Improvements.—A Local Government Board enquiry was recently held into the proposal of the Burnham Council to borrow £1,200 for the erection of shelters, band stand, and two public conveniences on the promenade. It is hoped to make the present work part of a scheme to be developed when possible, by which the entire sea front will be enlarged. Mr. W. J. Press, surveyor to the Council, has prepared the plans.

The Home Arts and Industries Association will hold its seventeenth annual exhibition of the work done in the classes of the association from May 16th to 20th in the gallery of the Royal Albert Hall. The exhibition will include specimens of wood carving, inlay, metal repoussé, embossed leather, baskets, spinning and weaving, lace, toys and rugs, and of other arts and industries. There will also be exhibits from the Brabazon and Home Art Scheme for Disabled Soldiers and Sailors.

Discoveries at Clonfert Cathedral.—During the restoration of Clonfert Cathedral recently several ancient tombstones and fragments of carved stone have been found lying about, some in the sacristy and others elsewhere. These included a tombstone with a Latin inscription two hundred years old, one with an English inscription equally old, and another, dated 1612, with an inscription in Latin in memory of Richard Callanan. These tombstones have been carefully preserved and placed in the vestibule of the cathedral.

An Isolation Hospital at Chingford has just been opened. The Walthamstow Urban District Council have been their own contractors, and the building has been designed by the Council's engineer, Mr. G. W. Holmes. The hospital stands in five acres of ground. There are seven separate buildings, including the administrative block, lodge and mortuary. The four others are for patients. Three of them contain fourteen beds each, while one has four beds, and will be used as a place of probation for invalids whose maladies have not been clearly defined. The total cost is £30,000.

A Housing Scheme at Liverpool.—The Liverpool City Council propose to demolish over 8,000 insanitary houses. The scheme for re-housing and demolition will cost a million and a half.

Messrs. S. B. Bolas and Company, architectural photographers—their lease of 77 Oxford Street, having been purchased by Messrs Gill and Reigate—have removed to larger and more convenient premises, 68 Oxford Street, opposite the old address.

New Schools at Halesowen, Worcestershire.—The tender of Mr. H. Dorse, of King Street, Cradley Heath, has been accepted for the erection of new schools at Halesowen. Messrs. Meredith and Pritchard, of Kidderminster, are the architects.

Memorial to a Chester Architect.—The master builders of Chester have decided upon placing a stained-glass window representing the figure of "Hiram, architect and artificer," builder of the Temple, in St. John's Church, Chester, as a memorial to the late Thomas Mealin Lockwood, architect, who was for many years a parishioner. The cost of the memorial will be about £150.

The Aberdeen Society of Architects held its annual general meeting recently, when the office-bearers and council for the ensuing year were elected as follows:—President, Mr. Arthur Clyne; vice-president, Mr. D. M'Millan; honorary treasurers and secretaries, Mr. John Rust and Mr. A. H. L. Mackinnon; members of council, Messrs. W. D. Ironside, W. Kelly, W. Ruxton, G. Watt and R. G. Wilson.

The new Burying Ground at Strathaven is being laid out and the roads made by Messrs. Donald and Co., Shettleston. A gravedigger's house and boundary walls with a railing is being erected by Mr. William Allan, builder, of Strathaven. The grounds are being laid from the plans of Mr. Cullen, architect, Hamilton. The principal entrance will be from the Stonehouse Road. The total cost will be £2,500.

Mr. Harold St. George Gray has been appointed to the post of librarian and curator of the Taunton Museum and assistant secretary of the Somerset Archæological Society. Mr. Gray, who is about 30 years of age, has been since May, 1899, chief assistant to Mr. Henry Balfour, keeper of the Pitt Rivers Collection at the Oxford University Museum. Previously he was for ten years secretary and assistant, and finally chief assistant, to the late General Pitt Rivers, H.M. Inspector of Ancient Monuments, who was so well known as an antiquarian and archæologist.

The Garden City Association.—At a meeting of this association held recently Mr. Ebenezer Howard, the promoter of the movement, explained that the view of the association regarding the housing problem was that it could be solved and the congestion in crowded centres relieved by a concerted movement of manufacturers, co-operators and others to new areas. Arrangements could be made for securing to the migrating people the whole of the increased value which their presence would give to the sites, the areas being planned so as to make adequate provision for the individual and social needs of the people, especially with a view to securing for all time the combined advantages of town and country life.

Birmingham University.—A correspondence has been proceeding between the secretaries of the Birmingham Architectural Association and the authorities of the University of Birmingham with regard to the preparation of plans for the new University buildings. Messrs. Aston Webb and E. Ingress Bell have been instructed to prepare sketch plans and the Association requested that a competition should be held on the lines of that for the Victoria Law Courts, in which the sketch plans drawn up by Mr. Waterhouse were supplied to the competitors. The University authorities replied however to the effect that they considered the principle of selecting designs by competition could not be advantageously adopted in their case. This decision the Association protested against, citing the vast scheme of the Californian University as one which has been successfully decided in competition.

In Memory of the late Sir George Grey.—A memorial bust and portrait will shortly be placed in the crypt of St. Paul's (where the ex-Colonial Governor was buried) and the National Portrait Gallery respectively. The bust is the work of Mr. Onslow Ford, and the portrait is an oil painting by Professor Herkomer.

A new Baptist Church at Cradley, Worcestershire, has just been erected at a cost of over £3,700, by Mr. H. Dorse, of King Street, Cradley Heath, from designs by Mr. A. T. Butler, architect, High Street, Cradley Heath. On Saturday evening last 70 workmen who have been employed on the works were entertained at a coffee supper in the Church parlour.

The Berlin Secessionists and English Artists.—Professor Max Liebermann, president of the Berlin Secessionists, has invited Messrs Sargent, Onslow Ford, and Rothenstein to send works to the third exhibition of the Berlin Secessionists, which will be opened in the beginning of May. He expressed his regret that he could not invite a larger number of English artists, owing to the limited space at his disposal.

Hull Royal Infirmary Competition.—The committee of the Hull Royal Infirmary have received the report of the assessors, Messrs. Young and Hall, on the designs submitted in competition for the extensive alterations and additions to the infirmary. They report that "The designs are all of high merit and show that great care and thought have been expended upon them." The awards are as follows:—1st., premium £100, Messrs. Worthington and Sons, Manchester; 2nd, premium £50, Mr. H. Percy Adams, London. The other competitors invited to send in designs were:—Messrs. Roger Smith and Son (London); Simpson and Allen, (London); W. A. Pite (London); Botterill and Bilson (Hull); Jacobs (Hull); and Freeman, Son and Gaskell (Hull).

British Archæological Association. — At a meeting of this association held on March 6th, Dr. W. de Grey Birch, F.S.A., presiding, a paper was read by the Rev. H. J. Dukinfield Astley, M.A., hon. editorial secretary, on "A ramble round Thetford," a quaint and fascinating old Norfolk town, or perhaps it should be called "city," for it was once an Episcopal see. In the fourteenth century Thetford possessed twenty churches, besides other religious buildings. The local authorities of to-day do not appear to have much regard for the antiquities of their historic town, as, in spite of protests, they have recently pulled down the old Guildhall. It was in the reign of William the Conqueror that Thetford became, for a brief period, a bishop's see, and in 1091 the Great East Anglian church builder Herbert de Rosinga succeeded as third Bishop. He did not, however, long remain at Thetford, as in 1094 he removed the see to Norwich. A plan of Thetford Priory, several early editions of antiquarian works. and a fine series of drawings of the "Old Halls and Manor Houses of Norfolk," by the late Mr. E. P. Willin, illustrated the paper.

"**Ecclesiastical Architectural Antiquities in Fife**" was the title of a lecture delivered to the student section of the Dundee Institute of Architecture recently by Mr. Charles G. Soutar. Mr. Soutar remarked that the study of the work of the past ten centuries was fascinating to the mind of the architectural student. He thus gained the instruction of the former masters of the art expressed by the buildings themselves, and imbued something of the spirit which directed the shaping of these unsurpassed creations, a study in which instruction was blended so happily with the rarest pleasure and recreation. After briefly tracing the influences which affected ecclesiastical art in Scotland generally from the time the Irish influence was superseded by that of Rome, through the various stages of the Gothic art, he took up severally the principal examples of structures showing these influences found in Fife, amongst which were the following in the order of their foundation:—The Monasteries in St. Andrews, Church of St. Regulus, Cathedral of St. Andrews, Balmerino Abbey, Abdie Church, Newburgh, Leuchars Church, St. Monance Church, Crail Church, Cupar Church, St. Salvator's or College Church, St. Andrews, and Dairsie Church.

A new Public Hall at Blaengwynfi is being erected at a cost of £2,800.

The Royal Institute of British Architects.—His Majesty the King has graciously consented to continue to be the patron of the R.I.B.A., and to offer, as was done by her late Majesty for over fifty years an annual Royal Gold Medal, to be presented on the nomination of the Royal Institute to a distinguished architect or architectural writer of any nationality.

St. Mary's Convent School at Nottingham is being erected for the Roman Catholic community in Derby Road. The schools will provide accommodation for 143 infants, 168 boys and girls mixed, and cooking class-room for 48 girls, with playgrounds approached by separate entrances from Tunnel Road. The architect is Mr. John Howitt, F.R.I.B.A., and the schools are being built under his supervision by Mr. Henry Vickers, at a cost of £4,250.

The Tomb of the late Lady Abbess d'Aurillac Dubois, of Stanbrook, has been both designed and executed by women. The figure of the Abbess, who lies outstretched upon her tomb, in much the position of the old Crusaders on theirs, her head a little lifted on a cushion, her robes lying in long, straight folds, is the work of Dame Beatrice, one of the Benedictine nuns at the Abbey. The little bas-reliefs that decorate the alabaster base are also modelled by Dame Beatrice, while the base itself was designed and the entire tomb executed by Miss Abbot and Miss Ferguson, with whom she worked before entering the convent.

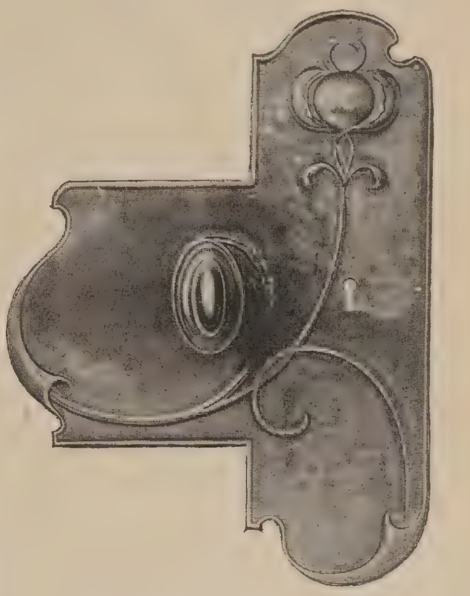
The Church of Swaffham-Prior St. Mary is in process of repair and restoration, and will shortly be completed and ready for use, after a lapse of nearly ninety years. During this period the sacred edifice was in a ruinous condition. Funds are being sought for to repair the fine old Norman tower which forms a distinguishing feature of the building. Apparently there has been some idea of rebuilding the steeple, which formerly surmounted the tower, and the upper part has been left ragged and loose, with the result that exposure to the weather has rendered it insecure.

New Police Buildings at Warrington are being erected. The buildings will have frontages to Wilson Patten Street, Museum Street, and Arpley Street, and will cover an extensive area. The dimensions of the police court are 52ft. by 40ft., coroner's court 44ft. by 21ft., and the parade ground, which will be covered, 97ft. by 50ft. The buildings will be fitted throughout with electric lights and bells, and the ventilation of the premises will be worked by a novel electrical system. The plans have been prepared by Mr. R. J. Burns Dick, and are being carried out under the supervision of Mr. Hallard, clerk of works.

The Northern Architectural Association held its annual meeting last week. Mr. Frank Caws, F.R.I.B.A. (president-elect), occupied the chair. The address of the retiring president, Mr. William Glover, was read in his absence by the hon. secretary, Mr. A. B. Plummer. Mr. Glover offered at the opening of the winter session of 1901 to add an extra prize to all the students who gain the institution prizes, also to the students to whom the assessors give "honourable mention." Mr. Arthur B. Plummer then read the annual report of the council for the 42nd session. Increasing success was therein recorded, and it was stated that the membership was as follows:—Ordinary members, 54; associates, 71; students, 61—total, 186. Mr. J. T. Cackett, hon. treasurer, read a financial statement showing that the year was commenced with a credit balance of £54 9s. and concluded with a balance of £89 4s. 6d. on the same side. Mr. H. C. Charlewood submitted a report as librarian and the hon. secretary another upon the work of the students' sketching club. The following officers were declared to have been duly elected:—President, Mr. F. Caws; vice-president, Mr. J. W. Taylor; hon. secretary, Mr. A. B. Plummer; hon. treasurer. Mr. J. T. Cackett; hon. librarian, Mr. H. C, Charlewood; council, Messrs. R. B. Dick, J. W, Donald, R. J. Leeson, J. Oswald and T. Reay; associates, Mr. J. W. Boyd and Mr. R. P. S. Twizell.

ARTISTIC DOOR FURNITURE.

THE increasing adoption by women of trades and professions in which men have hitherto exclusively practised is a significant feature of the times, and one which augurs much for the future. In each new field which they enter as competitors, women have to encounter the same masculine opposition, and though they are quite unsuited for certain classes of work which have been tried by them, yet in numerous other occupations they have proved that they can achieve considerable success. We are becoming accustomed to hear of lady sanitary inspectors, lady bookbinders, lady doctors, and even lady architects—not to mention lady lawyers, preachers or auctioneers —and there seems no reason to doubt that the future will see ladies largely engaged in house decoration, plaster modelling and similar work. As an indication of this wider field of employment for ladies we may refer to Mrs. Starkie Gardner, who makes a speciality of repoussé work in all metals, particularly iron, brass, copper and pewter. At 18 Clifford Street, Bond Street, W., specimens of her work, and also that of the several ladies under her superintendence, may be examined. Mrs. Gardner produces all kinds of articles but makes a speciality of door furniture, an example of which is shown by the above illustration of a finger plate. Those needing artistic fittings of this kind should pay a visit to 18 Clifford Street.



TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the Work.

ASHFORD, Middlesex.—For the erection of a new Board school at Feltham Hill Road, for the Ashford School Board. Mr. Richard J. Lovell, architect, 46 Queen Victoria Street, London, E.C. Quantities by Messrs. Fleetwood, Son & Eversden:—

G. Hill & Co., London	£4,854
Foster Bros., Norwood	4,736
J. Cracknell, Peterborough	4,718
J. H. Kingerlee & Sons, Oxford	4,615
H. Emmett, Feltham	4,604
Roome & Co., London	4,600
Martin, Wells & Co., London	4,599
Measom & Son, Twickenham	4,571
J. Appleby, London	4,555
A. & B. Hansom, Southall	4,532
E. Chamberlain, Addlestone	4,525
R. & L. Tonge, Watford	4,500
Drowley & Co., Woking	4,462
W. Wisdom,* Isleworth	4,380

* Provisionally accepted.

HARROW AND WEALDSTONE.—For the construction of about 800ft. of new roads and sewers on the College Estate, Wealdstone; also for about 750ft. of new roads and sewers on the Headstone Estate, Harrow. Messrs. Clarke & Charles, surveyors, Harrow:—

College Estate.

R. Ballard, Limited	£1,572	14	9
C. Ford	1,878	0	0
C. W. Killingback & Co.	1,164	0	0
W. Neave & Son	1,064	0	0
G. Wimpey & Co.	1,048	0	0
T. Adams	999	8	2
Wilson & Border	876	1	2
T. Free & Sons	860	0	0
Meston & Hale	795	12	0
G. R. Mann	780	15	10
E. W. Hollingsworth	763	19	10
S. Saunders	756	0	0

[Headstone Estate.

	£	s.	d.
C. Ford	1,560	0	0
C. W. Killingback & Co.	1,327	0	0
W. Neave & Son	1,271	0	0
G. Wimpey & Co.	1,245	0	0
T. Adams	1,131	4	1
T. Free & Sons	1,005	0	0
G. R. Mann	979	10	1
Meston & Hale	972	18	0
R. Ballard, Limited	948	15	7
E. W. Hollingsworth	943	7	8
Wilson & Border	933	0	9
S. Saunders	889	18	4

LINGFIELD, Surrey.—For the erection of banking premises and residence, for Mr. D. W. Farrance. Mr. W. C. F. Gillam, M.S.A., architect, Brighton:—

	£	s.
Young, East Grinstead	£1,295	0
Head	1,280	0
Dives	£1,240	12
Stanford*	1,145	10

* Accepted.

[Rest of Lingfield.]

LONDON.—For improvements at Canterbury Road School, for the London School Board. Mr. T. J. Bailey, architect:—

	£
E. Lawrence & Sons	£6,705
E. P. Bulled & Co.	6,619
F. & H. F. Higgs	6,581
W. H. Lorden & Son	6,505
J. Garrett & Son	6,376
J. Marsland & Sons	6,335
W. Johnson & Co., Ltd.	£6,298
W. Downs	6,292
Holliday & Greenwood	5,997
W. Smith	5,838
J. Appleby*	5,778

* Recommended for acceptance.

LONDON, E.C.—For alterations and additions, &c., to Sadlers' Wells Theatre, Rosebery Avenue, E.C. Mr. Bertie Crewe, architect, Savoy House, W.C. Quantities by Mr. H. E. Pollard, 6 York's Buildings, Adelphi, W.C.:—

Alterations.

	£
Antill & Co.	£3,700
Johnson & Co.	3,624
Hobson	3,493
Andrews	3,099
Veale	2,599
Pitcher	2,253
Weibking & Sons,* Southgate Road, N.	2,145

Painting.

	£
Antill & Co.	£250
Johnson & Co.	248
Hobson	240
Andrews	199
Weibking & Sons*	145
Veale	139
Pitcher	138

* Accepted.

MIDDLETON, Lancs.—For the erection of a new store and four cottages at Parkfield, Middleton, for Middleton Co-operative Society. Mr. F. W. Dixon, architect, Trevelyan Buildings, Manchester, and Union Street, Oldham:—

	£
Ogden & Holland	£3,087
R. Roberston	3,050
W. Pollitt	3,014
J. Simpson	2,985
R. Ridings	2,982
Partington & Son	£2,975
C. Alderson	2,966
Grundy, Sons & Co.	2,960
Jackson & Sons*	2,815

* Accepted.

NOTTINGHAM.—For the erection of motor-car works to be built in Canal Street, Nottingham. Mr. W. Dymock Pratt, Cauldon Chambers, Long Row, Nottingham, architect:—

	£	s.	d.
E. Hind	£1,840	0	0
H. Green & Son	1,809	10	0
J. Lewin, Netherfield	1,802	0	0
G. M. Kerry	1,800	14	5
W. Crane, Ltd.	1,788	0	0
W. Maule	1,710	0	0
F. Messom	£1,670	0	0
A. G. Bell	1,663	0	0
J. Wright	1,645	0	0
T. Cuthbert	1,645	0	0
J. H. Williamson & Co.	1,584	0	0
J. G. Thomas*	1,547	0	0

* Accepted.

[Rest of Nottingham.]

SIDCUP.—For the erection of a new police station at Sidcup:—

	£
Lawrance & Sons	£8,798
G. Parker	8,490
Graham & Co.	8,489
C. Ansell	8,388
Holloway Bros.	8,350
Smith & Sons, Limited	8,338
S. Hart	£8,327
Higgs & Hill, Limited	8,284
T. Knight	8,089
Burman & Sons	8,075
Chessum & Sons	7,977

WANSTEAD, Essex.—For the construction of concrete tanks, filters, &c., at their sewage farm, for the Wanstead Urban District Council:—

	£	s.	d.
H. Payne	£5,300	0	0
J. Burrell	5,175	0	0
S. Saunders	4,025	0	0
Foster Bros.	3,956	0	0
J. Jackson	3,930	0	0
A. W. Robins	3,718	0	0
W. & C. French	3,500	0	0
W. Griffiths & Co.	3,488	5	11
J. E. Johnson & Son	£3,375	10	0
T. Adams	2,983	11	5
C. Ford	2,926	0	0
G. Bell	2,859	0	0
Wilson, Border & Co., 1 Derby Gardens, Ilford	2,841	5	2

CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Hay, best	per load	4	0	0	4	7	6
Sainfoin mixture	do.	3	10	0	4	10	0
Clover, best	do.	4	5	0	5	0	0
Beans	per qr.	1	11	0		—	
Straw	per load	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	2	2	1	12	1
Colza Oil, English	do.	1	6	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	1	0		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels	do.	1	3	0	1	3	3
Petroleum, American	per gal.	0	0	6⅝	0	0	7
Do. Russian	do.	0	0	6¼	0	0	6½
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	2	19	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	4	6	1	5	6
Tar, Stockholm	per barrel	1	8	0		—	
Turpentine	per cwt.	1	6	10½	1	7	0

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	84	0	0		—	
Iron, Staffs., bar	do.	6	15	0	9	10	0
Do Galvanised Corrugated sheet	do.	11	0	0	11	5	0
Lead, pig, Spanish	do.	12	17	6	13	0	0
Do. do. English common brands	do.	13	12	6		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do., floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	15	0	7	0	0
Do. Mild Bars	do.	7	5	0	7	15	0
Tin, Foreign	do.	116	10	0	117	0	0
Do. English ingots	do.	121	0	0		—	
Zinc, sheets, Silesian	do.	20	10	0		—	
Do. do. Vieille Montaigne	do.	21	0	0		—	
Do. Spelter	do.	16	5	0	17	0	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Do. Pitch	do.	2	15	0	3	18	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P. Std.	15	5	0	17	0	0
Do. do. 4th & 3rd	do.	11	15	0	13	5	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	15	0	15	5	0
Do. do. 2nd "	do.	8	15	0	14	15	0
Do. do. Unsorted "	do.	5	5	0	13	0	0
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	11	10	0	16	15	0
Do. White Sea	do.	10	0	0	14	15	0
Do. Quebec Pine, 1st	do.	22	0	0	23	0	0
Do. do. 2nd	per P. Std.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0	12	15	0
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	7	15	0	10	10	0
Flooring Boards, 1in. prepared, 1st	per square	0	12	0	0	13	0
Do. 2nd	do.	0	9	3		—	
Do. 3rd &c.	do.	0	8	6		—	

CONTRACTS OPEN.

ISLE OF THANET UNION.

TO DRAINAGE CONTRACTORS AND PLUMBERS.

The Guardians propose to FIT UP W.C.'S and CONSTUCT DRAINAGE and INCIDENTAL WORKS to the Infirmary Buildings at the Workhouse at Minster.

Plan can be seen at the Board Room, Minster, and also at the Offices of the Architect, Mr. LEONARD GRANT, Sittingbourne.

Forms of Tender and all particulars may be obtained on application to the Architect.

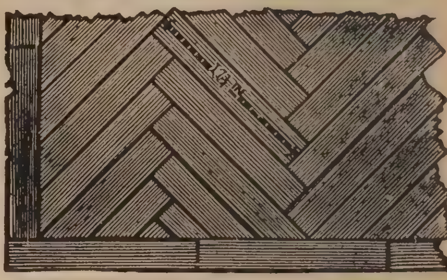
Tenders marked on cover "Infirmary Drainage," must reach me through the post by WEDNESDAY, the 27th inst.

The Guardians do not bind themselves to accept the lowest or any Tender.

By order,
CHAS. TAYLOR, Clerk.

Board Room,
Minster, Ramsgate,
March 1901.

FLOORING BLOCKS.



Per 100 Blocks out of sizes.	YELLOW		PITCH PINE
	At Wharf.	ex Ship within one month.	At Wharf.
17½×3×3	13 8	12 9	20 0
17½×3×2	8 11	8 2	14 6
17½×3×1½	6 10	6 3	10 9

PRIME DRY OAK & PITCH PINE FLOORING,
With Special Joint to conceal Nails—
1½×4½ Oak, 56/9 Pitch Pine, 29/- per square
1 ×4½ " 45/6 " 25/6 "
These prices include desiccation.
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SLATE SLAB GOODS:
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

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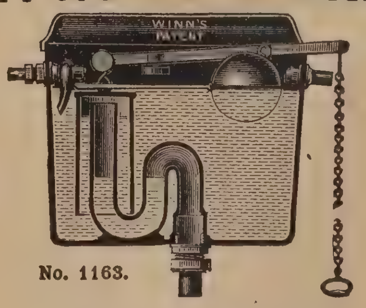

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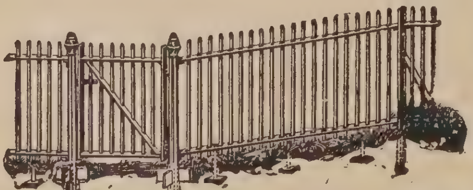

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SELF-ADJUSTING ROUND-BAR
RAILING (No. 2740),
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ILLUSTRATED CATALOGUE OF ALL KINDS OF HURDLES FENCING GATES &c. FREE.
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WOOD PAVING AND STEAM JOINERY WORKS,
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BLIND LATHS
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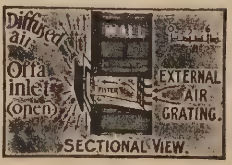
Estbd LONDON. 1832.

THE OFFA VENTILATOR.



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Exhausts when blown upon outside.
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Adjustable aperture. Noiseless—no moving parts. Cleaned from inside.
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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
	BUILDING.		
Mar. 22	Feltham—Infants' School	School Board	W. R. Low, 10 Basinghall Street, E.C.
„ 22	Bolton—Enlargements	Commissioners	Postmaster, Bolton
„ 22	Wimbledon—Additions of Electricity Generating Station	Urban District Council	C. H. Cooper, Surveyor's Office, The Broadway, Wimbledon.
„ 22	Newtownards, Ireland—Alterations	Urban District Council	Gasworks Office, Newtownards.
„ 23	Leigh—Retorts, &c.	Gas Committee	J. Forter, Gasworks, Leigh.
„ 23	Ogmore Vale, Wales—Altering, &c.	Llandyfodwg School Board	J. Rees, Architect, Pentre Rhondda.
„ 23	Probus, Cornwall—School, &c.	Board of Education	Savage, Post Office, Probus.
„ 23	Bryncrug, near Towyn—Rebuild Hotel	—	Cross Pipes, Bryncrug, near Towyn.
„ 23	Newcastle on-Tyne—Police and Fire Brigade Station	—	Cackett and Burns, 24 Grainger Street West, Newcastle-on-Tyne.
„ 23	Ashby-de-la-Zouch—School, &c.	Governors	Barrowcliff and Allcock, Architects, Loughborough.
„ 23	Buxton—Wall, &c.	Gas Committee	H. Barker, Gas Engineer, Town Hall, Buxton.
„ 23	Gravesend—Fish Market	Town Council	E. J. Bennet, 189 Parrock, Gravesend.
„ 25	Elland, Yorks—Public Baths	Urban District Council	G. Hepworth, 20 Bradford Road, Brighouse.
„ 25	Newport—Foundations	Corporation	R. H. Haynes, Borough Engineer, Newport, Mons.
„ 25	Norton Lees—School	School Board	J. Norton, Alliance Chambers, George Street, Sheffield.
„ 25	Leeds—Vagrant Wards	Guardians	T. Winn and Sons, 92 Albion Street, Leeds.
„ 25	London, N.—Chimney Shaft	Hornsey Urban District Council	E. J. Lovegrove, Council Surveyor Hornsey.
„ 25	Manchester—Urinals	Sanitary Committee	City Surveyor, Town Hall, Manchester.
„ 25	Bacup, Lancs—Bricks, &c.	Corporation	Borough Surveyor's Office, Bacup, Lancs.
„ 25	Coleshill, Birmingham—Seven Cottages	Oddfellows' Committee	T. Dale, Secretary, Coventry Road, Coleshill.
„ 26	Cherry Tree, near Blackburn—Goods Warehouse, &c.	Lancs and Yorks Railway Company	Engineer's Office, Hunt's Bank, Manchester.
„ 26	Ditchampton, Wilts—Cottage	Wilton Town Council	Municipal Offices, Russell Street, Wilton.
„ 26	Thorner, Leeds—Houses	J. A. Booth	H. Walker, 8 Upper Fountaine Street, Leeds.
„ 27	Bishop Auckland—Shops, &c.	North-Eastern Railway Company	W. Bell, Central Station, Newcastle.
„ 27	Catchgate, Durham—Cementing	Greencroft School Board	G. T. Wilson, 121 Durham Road, Blackhill.
„ 27	Dublin—Buildings	Guardians	Morris, Clerk of Works, Dublin.
„ 27	Whitley, Northumberland—Rebuilding Hotel	Blyth and Tyne Brewery Company	J. Potts and Son, 57 John Street, Sunderland.
„ 27	Hever, Kent—Isolation Hospital	Joint Hospital Board	Gleed and Belcher, 8 & 9 Martin's Lane, Cannon Street, E.C
„ 26	London, N.E.—Wharf, &c.	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, S.W.
„ 29	Heath Town—Extending School	Wednesfield School Board	F. H. Lynes, Gresham Chambers, Lichfield Street, Wolverhampton.
„ 29	London, E.—Nurses' Home, &c.	St. George's in-the-East Guardians	J. H. May, 249½ High Holborn, W.C.
„ 29	Hull—Refuse Destructor Buildings	Corporation	A. E. White, City Engineer, Town Hall, Hull.
„ 30	London, N.W.—Orphanage	St. Pancras Female Orphanage School	S. G. Goss, 3 Broad Street Buildings, Liverpool Street, E.C
„ 30	Chew Magna, Bristol—Enlargement	School Board	W. E. Milton, Clerk, Chew Magna.
„ 30	Whitehead, Ireland—Premises	Fleming and Co.	J. Russell, 22 Waring Street, Belfast.
April 1	Wilmslow, Cheshire—Police Station	—	H. Beswick, Newgate Street, Cheshire.
„ 8	Brede, Sussex—Villa	—	T. Reid, Conster Manor House, Brede, Sussex.
„ 9	London, S.W.—Building Materials and Tools	Prison Board	Prison Commission Office, Home Office, Whitehall, S.W.
„ 10	Sudbury, Suffolk—Police Station and Police Quarters	West Suffolk Standing Joint Committee	F. Whitmore, Architect, Chelmsford.
„ 11	Carlisle—Bridge Works, &c.	Committee	W. Hodgson, Local Surveyor, Keswick.
„ 16	Ballymacreely, Ireland—Villa	—	W. J. Fennell, Scottish Provident Buildings, Belfast.
„ 16	Evesham—Culverts	Rural District Council	E. Wadams, Union Offices, Evesham.
„ 16	London, N.—Renovation, &c.	—	Vicarage, St. John's Church, Highbury Vale.
„ 16	Llanbradach—Hotel	—	Teather and Wilson, Andrew's Buildings, Queen Street, Cardiff.
„ 18	Cleethorpes—Schools	School Board	F. W. Croft, Victoria Chambers, Victoria Street, Great Grimsby.
„ 18	Belfast—Timber Jetties	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
„ 18	Dundee—Seawall	—	W. Mackison, 91 Commercial Street, Dundee.
„ 24	Clowne, Derbyshire—Lock-up	Standing Joint Committee	J. S. Story, County Offices, St. Mary's Gate, Derby.
	ENGINEERING.		
Mar. 22	Colwyn Bay—Dynamo, &c.	Urban District Council	Lacey, Clirehugh and Sillar, 2 Queen Anne's Gate, Westminster.
„ 22	West Ham—Supplies	Town Council	Borough Electrical Engineer's Office, Abbey Mills, West Ham, E.
„ 22	Harrogate—Steam Road Roller	Corporation	F. Bagshaw, Municipal Offices, Harrogate.
„ 23	Wolverhampton—Electrical Tramways	Tramways Committee	C. E. C. Shawfield, Commercial Road, Wolverhampton.
„ 23	Manchester—Boiler	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
„ 23	Buxton—Gasholder Tank, &c.	Gas Committee	H. Barker, Gas Engineer, Town Hall, Buxton.
„ 23	Clitheroe, Lancs—Water supply Works	Rural District Council	J. Eastham, Church Street, Clitheroe.
„ 25	Newport, Mon.—Constructional Steelwork, &c.	Corporation	H. F. Parshall, 8 Princes Street, Bank, London, E.C.
„ 25	Gravesend—Electrical Equipment for Tramways	Electric Tramways Committee	C. Dade, British Electric Traction Company, Donington House, Norfolk Street Strand, London, W.C.
„ 25	Manchester—Switchboard, &c.	Electricity Committee	F. E. Hughes, Town Hall, Manchester.
„ 25	Darwen Lancs—Extension of Tramways	Corporation	Borough and Electrical Engineer, Darwin.
„ 26	Burnley—Permanent-way Materials	Corporation	Borough Surveyor's Office, Burnley.
„ 26	Shoeburyness—Tanks, &c.	Urban District Council	H. Harris, Clarence Street, Southend.
„ 26	West Ham—Steam Road Roller	Corporation	Borough Engineer's Office, Town Hall, West Ham.
„ 26	London, E.C.—Copper and Steel Plates	South Indian Railway Co., Ltd.	Company's Offices, London, E.C.
„ 27	Warrington—Electric Tramways	Corporation	Preece and Cardew, 13 Queen Anne's Gate, Westminster, S.W.
„ 27	Kettering—Refuse Destructor	Urban District Council	T. R. Smith, Market Place, Kettering.
„ 27	Leeds—Subway	Lighting Committee	Milnes and France, Architects, Swan Arcade, Bradford.
„ 28	London, N.—Wharf and Lay-bye	Hackney Borough Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
„ 28	Dorchester—Sewage Purification Works	Town Council	G. J. Hunt, Borough Engineer, Guildhall, Dorchester.
„ 28	London, N.W.—Rendering Baths Watertight	Hampstead Borough Council	C. H. Lowe, Surveyor, Town Hall, Haverstock Hill, N.W.
„ 29	Sunderland—Cables, &c.	Corporation	J. F. C. Snell, Dunning Street, Sunderland.
„ 30	Penryn, Cornwall—Harbour Works	Harbour Authority	J. P. Jenkins, Town Hall, Penryn.
„ 30	Guildford—Bridge	Corporation	J. J. Webster, 39 Victoria Street, Westminster.
April 1	Amsterdam—Electrical Plant	Burgomaster en Werthouders	Director, Town Printing Works, Achterburgwal 213, Amsterdam.
„ 2	St. Albans—Bacterial Beds, &c.	City Council	Beesley Son and Nichols, 11 Victoria Street, Westminster, S.W.
„ 10	Rosario—Harbour Works	Argentine Government	Commercial Department, Foreign Office, S.W.
„ 15	Aberdeen—Fuel Economiser, &c.	Electric Lighting Committee	J. A. Bell, Cotton Street, Aberdeen.
„ 15	Wimbledon—Cable, &c.	Urban District Council	Electric Lighting Works, Durnsford Road, Wimbledon.
„ 15	Warrington—Pumping Plant	Corporation	J. Deas, Municipal Offices, Warrington.
	IRON AND STEEL.		
Mar. 23	Halifax—Ironmongery, &c	Corporation	Town Clerk, Town Hall, Halifax.
„ 23	Waterloo—C. I. Ventilating Pipes, &c.	Urban District Council	F. S. Yates, Surveyor, Town Hall, Waterloo.
„ 23	Colne, Lancs—Manhole Covers, &c.	Town Council	T. H. Hartley, Borough Surveyor, Colne.
„ 25	Bacup, Lancs—Ironmongery, Castings, &c.	Corporation	Borough Surveyor, Town Hall, Bacup.
„ 26	Leek, Staffs—Manhole Covers, &c.	Urban District Council	J. Myatt, Town Surveyor, Town Hall, Leek, Staffs.
„ 26	Croydon—Wrought-iron Fencing and Gates	Corporation	Borough Engineer, Town Hall, Croydon.
„ 27	Amsterdam—Pipes	H.M. Ministry	M. Nyhoff, Bookseller, The Hague.
„ 28	Dundee—Steel Girder Rails, &c.	Town Council	W. Mackison, 91 Commercial Street, Dundee.
„ 29	Hull—Steel Roofs for Destructor	Corporation	A. E. White, City Engineer, Town Hall, Hull.
„ 30	Epsom—Sewerage Ironwork	Urban District Council	Surveyor, Bromley Hurst, Church Street, Epsom.
„ 30	Norway—Rails, Steel Sleepers, &c.	—	Commercial Department of the Foreign Office, Norway.
April 1	Llanelly, Wales—Ironmongery, &c.	Urban District Council	Surveyor, Town Hall, Llanelly.
„ 8	Pietermaritzburg, Natal—Water Pipes	Corporation	Ford Brothers, 12 Southampton Street, Fitzroy Square, London.
	PAINTING AND PLUMBING.		
Mar. 23	Gravesend—Painting	Town Council	E. J. Bennett, 189 Parrock Street, Gravesend.
„ 23	Hounslow—Oils, Paints, &c.	Urban District Council	P. G. Parkman, Surveyor, Town Hall, Hounslow.
„ 23	Swindon—Oils, Paints, &c.	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon.
„ 25	Tremain, Wales—Painting, &c., Chapel	—	— Williams, Tretere.
	ROADS AND CARTAGE.		
Mar. 22	Walthamstow—Concrete Flags	Urban District Council	E. Morley, Surveyor, Town Hall, Walthamstow.
„ 22	Newark—Granite and Slag	Rural District Council	R. Oakden, jun., Surveyor, Kirkgate, Newark.
„ 22	London, E.—Flints, Curb, &c.	East Ham Urban District Council	C. E. Wilson, Clerk, Public Offices, Wakefield Street, East Ham, E.
„ 22	Guildford—Materials	Rural District Council	W. S. V. Cullertre, Clerk, Commercial Road, Guildford.
„ 23	Colne, Lancs—Flags, Kerb, &c.	Town Council	T. H. Hartley, Borough Surveyor, Colne.
„ 23	Swindon—Road Stone, &c.	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon.
„ 23	Great Harwood—Street Works	Urban District Council	R. Chippendale, Clerk, Town Hall, Great Harwood.
„ 23	Waterloo, Lancs—Cartage, Macadam, &c.	Urban District Council	F. S. Yates, Surveyor, Town Hall, Waterloo.
„ 23	Blackburn—Granite Setts	Highways Committee	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	Road and Cartage.—*Continued.*		
Mar. 23	Beverley—Whinstone and Gravel	East Riding County Council	A. Beaumont, County Surveyor, Beverley.
„ 23	Blairgowrie, Scotland—street works, &c.	——	G. Cunnison, Borough Surveyor, Blairgowrie.
„ 23	Driffield, Yorks—Materials	Rural District Council	T. C. Beaumont, Surveyor, Driffield.
„ 23	Selby—Materials	Rural District Council	E. Townsend, Clerk, Council Offices, Abbey Place, Selby.
„ 23	Hounslow—Cartage, Broken Granite, &c.	Heston Urban District Council	P. G. Parkman, Town Hall, Hounslow.
„ 23	Blackburn—Granite Setts	Highways Committee	W. Stubbs, Municipal Offices, Blackburn.
„ 25	Beckenham—Approach Roads to Bridge	Urban District Council	J. A. Angell, Surveyor to Council, Beckenham.
„ 25	Bacup, Lancs—Flags, kerbs, setts, &c.	Corporation	Borough Surveyor, Town Hall, Bacup.
„ 25	Elland Paving	Urban District Council	P. H. Whitwam, Council Offices, Elland.
„ 25	Gateshead—Materials	——	J. Bower, Borough Surveyor, Town Hall, Gateshead.
„ 25	Hemsworth—Materials and making-up	Rural District Council	T. H. Richardson, Surveyor, Hemsworth, nr. Wakefield.
„ 25	Horsham—Materials, &c.	Rural District Council	W. Dengate, 58 Park Street, Horsham.
„ 25	Leighton Buzzard—Granite, flints, &c.	Wing Rural District Council	J. McKenzie, Surveyor, Linslade, Leighton Buzzard.
„ 25	Pontefract—Materials	Rural District Council	W. A. Glover, Clerk, Union Offices, Pontefract
„ 25	Wellingborough—Materials	Rural District Council	W. Jackson, Clerk, Workhouse, Wellingborough.
„ 25	West Woodburn—Removal of Quarry Boring	——	Benson Brothers, West Woodburn, Northumberland.
„ 25	Southend on-Sea—Wood Paving	Essex County Council	P. J. Sheldon, Surveyor, County Offices, Chelmsford.
„ 26	East Molesey—Cartage, Granite, &c.	Urban District Council	Surveyor District Council Office East Molesey.
„ 26	Leek, Staffs—Materials, &c.	Urban District Council	J. Myatt, Town Surveyor, Leek, Staffs.
„ 26	London, N.—Works	Hornsey Urban District Council	E. J. Lovegrove, 99 Southwood Lane, Highgate, N.
„ 26	Uppingham—Materials	Rural District Council	J. E. Willford, Clerk, Uppingham.
„ 26	West Malling, Kent—Materials	Rural District Council	J. Marshall, Surveyor, West Malling, Kent.
„ 26	Wembley, Middlesex—Materials	Urban District Council	C. R. W. Chapman, Public Offices, Wembley.
„ 26	West Ham, E.—Steam Road Roller	Corporation	Borough Engineer, Town Hall, West Ham, E.
„ 27	Strood, Kent—Repairs	Rural District Council	G. W. Prall, Workhouse, Strood.
„ 27	Burgess Hill—Roadworks	Urban District Council	A. F. Hardwick, Clerk, Church Road, Burgess Hill, Sussex.
„ 28	Barton Regis, Bristol—Materials	Rural District Council	H. T. H. Lancaster, Clerk, Barton Regis.
„ 28	Repton, near Burton-upon-Trent—Materials, &c.	Rural District Council	C. F. Chamberlin, Clerk, Union Offices, Burton-on-Trent.
„ 28	Sale, Cheshire—Asphalting	Urban District Council	W. Holt, Surveyor, Council Offices, Sale.
„ 29	Chatham—Materials	Admiralty	Superintending Civil Engineer, Chatham Dockyard.
„ 29	Ramsey, Hunts.—Broken Granite	Urban District Council	F. R. Sergeant, Clerk, Ramsey, Hunts.
„ 30	Whitwood Mere—Improvements	Urban District Council	A. H. Hartley, Surveyor, County Chambers, Castleford.
„ 30	Batley, Yorks—Materials	Town Council	C. J. Kirby, Borough Surveyor, Market Place, Batley.
„ 30	Epsom—Setts, Kerbing, &c,	Urban District Council	Surveyor, Bromley Hurst, Church Street, Epsom.
April 1	Hastings—Kerb	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
„ 1	Rochford, Essex—Materials	Rural District Council	F. Gregson, Clerk, Southend-on-Sea.
	SANITARY.		
Mar. 22	South Crosland—Scavenging	Urban District Council	H. Ashurst, Bank End, Netherton.
„ 23	Hounslow—Lime, Stoneware, Pipes, &c.	Urban District Council	P. G. Parkman, Surveyor, Town Hall, Hounslow.
„ 25	Manchester—Urinal Stalls	Sanitary Committee	City Surveyor, Town Hall, Manchester.
„ 25	Crookedholm, Scotland—Sewers, &c.	Special Drainage Committee	J. Sturrock, jun., 2 Market Lane, Kilmarnock.
„ 25	Haworth, Yorks—Scavenging	Urban District Council	Council's Office, Mill Hey, Haworth.
„ 25	Lymington—Sewer Out-fall Repairs	Town Council	J. P. Jones, 83 High Street, Lymington.
„ 25	South Kirkby, Yorks—Extension of Sewer	Hemsworth Rural District Council	T. H. Richardson, Surveyor, Hemsworth.
„ 26	East Molesey—Stoneware Pipes, &c.	Urban District Council	Surveyor, District Council Office, East Molesey.
„ 26	London, S.W.—Drainage Works	Fulham Borough Council	Public Health Department, Town Hall, Walham Green, S.W.
„ 26	Wembley, Middlesex—Lime, &c.	Urban District Council	C. R. W. Chapman, Public Offices, Wembley.
„ 26	Woodford-cum-Membris, Northants—Sewage Works	Daventry Rural District Council	J. B. Williams, Moot Hill, Daventry.
„ 27	Enfield—Sewers	Urban District Council	R. Collins, Surveyor, Court House, Enfield.
„ 27	Pontardawe, Wales—Sewerage Works	Rural District Council	J. Morgan, Engineer, Herbert Chambers, Pontardawe.
„ 27	Minster—Drainage Works, &c,	Isle of Thanet Union Guardians	L. Grant, Architect, Sittingbourne.
„ 28	Dorchester—Sewers	Town Council	G. J. Hunt, Guildhall, Dorchester.
„ 28	Twickenham—Sewers, &c.	Urban District Council	F. W. Pearce, Surveyor, Town Hall, Twickenham.
„ 29	Lichfield—Sewerage Works	Urban District Council	H. Russell, 5 Market Street, Lichfield.
April 1	Basford, Notts—Sewers	Basford Rural District Council	S. Maylan, Public Offices, Basford.
	TIMBER.		
Mar. 23	Halifax—Timber	Corporation	Electricity Works, Foundry Street, Halifax.
„ 23	Swindon—Timber	Corporation	H. J. Hamp, Town Hall, Swindon.
April 1	Llanelly, Wales—Timber	Urban District Council	H. W. Spawart, Clerk, Town Hall, Llanelly.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
March 25	Basford—Sewerage Scheme	——	C. J. Spencer, Clerk, Public Offices, Basford
April 30	Keighley—Public Library	£50, £30, £20	W. H. Hopkinson, Borough Engineer, Town Hall, Keighley.
June 10	Ennis, co. Clare—Additions, &c., to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.

COMING EVENTS.

Wednesday, March 20.

SOCIETY OF ARTS.—Mr. Percy T. Macquoid on "Evolution of Form in English Silver Plate," 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

RUSKIN SOCIETY of BIRMINGHAM.—The Right Rev. the Lord Bishop of Ripon on "Dante," 8 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration in the District of St. George's, Hanover Square, at 2 p.m., conducted by Mr. Albert Taylor.

Thursday, March 21.

SOCIETY OF ARCHITECTS.—Mr. W. J. Jennings, F.S.I., on "Dilapidations," 8 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Professor Henry Robinson, M.I.C.E., on "Sewerage."

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

ROYAL INSTITUTION.—Sir Wyke Bayliss on "Shakespeare in Relation to his Contemporaries in Art."—I. 3 p.m.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

Friday, March 22.

ARCHITECTURAL ASSOCIATION (DISCUSSION SECTION).—Mr. S. L. Crosbie on "Lincoln Cathedral," 7 p.m.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Lectures on Temporary Carpenter Work: Mr. Robert Stuart on "Gabbert Scaffolds and Crane Seats," Mr. Richard Wilson on "Centering," and Mr. W. H. Baxter on "Temporary Stands," 8 p.m.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

INSTITUTION OF JUNIOR ENGINEERS.—Engineering Question Night, 8 p.m.

INSTITUTION OF CIVIL ENGINEERS (Students' Meeting).—Mr. C. L. McDermott on "The Hunslet Railway, and Bridge over the River Aire," 8 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Examination in Practical Sanitary Science (First Day).

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. C. E. Bateman, F.R.I.B.A., on "B.A.A. Excursion to Stamford," illustrated by Mr. John Ward and others.

ROYAL INSTITUTION.—Mr. Horace T. Brown, LL.D., F.R.S., on "Some Recent Work on Diffusion," p p.m.

Saturday, March 23.

INSTITUTE OF SANITARY ENGINEERS.—Examination in Practical Sanitary Science (Second and Final Day).

DUNDEE INSTITUTE OF ARCHITECTURE.—Visit to Baldovan Asylum at 1.25 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visit to the Victoria Cabinet Works, Kirkcaldy.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Inspection and Demonstration at the Sewerage Works, Sutton, Surrey, at 3 p.m., conducted by Mr. C. Chambers Smith.

Monday, March 25.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 8 p.m.

INCORPORATED INSTITUTE OF BRITISH DECORATORS (Painters' Hall, Little Trinity Lane, E.C.).—Dr. G. C. Williamson on "The Art of Fresco Painting in Italy," 8 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Demonstration of Bookkeeping as carried out in a Sanitary Inspector's Office, in the Parke's Museum, at 7 p.m., by Mr. Albert Taylor.

GLASGOW INSTITUTE OF ARCHITECTS.—Council Meeting at 2 p.m.

SOCIETY OF ARTS (Cantor Lectures).—Major P. Cardew on "Electric Railways"—III, 8 p.m.

Tuesday, March 26.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Professor Henry Robinson, M.I.C.E., on "Sewage Disposal," 7 p.m.

Wednesday, March 27.

SOCIETY OF ARTS.—Mr. A. A. Johnston on "Clocks Carillons and Bells," 8 p.m.

CITY OF LONDON COLLEGE SCIENCE SOCIETY.—Mr. A. T. Walmisley, M.I.C.E., on "Building Stones," 7.30 p.m.

EDINBURGH ARCHITECTURAL SOCIETY.—Mr. W. Scott Morton on "Aids and Hindrances to Design."

SANITARY INSTITUTE.—Lectures and Demonstrations, for Sanitary Officers, Part I.—Inspection and Demonstration at the East London Water Works, Lea Bridge, Clapton, at 3 p.m., conducted by Mr. W. B. Bryan M.I.C.E.

Thursday, March 28.

GLASGOW INSTITUTE OF ARCHITECTS.—General Meeting at 2 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Professor Henry Robinson, M.I.C.E., on "Scavenging, Disposal of House Refuse," 7 p.m.

ROYAL INSTITUTION.—Sir Wyke Bayliss on "Shakespeare in Relation to his Contemporaries in Art."—II., 3 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—First Conversazione at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly.

INSTITUTION OF ELECTRICAL ENGINEERS.—Meeting at 8 p.m.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

MARCH 20, 1901.
No. CCCXX.

EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

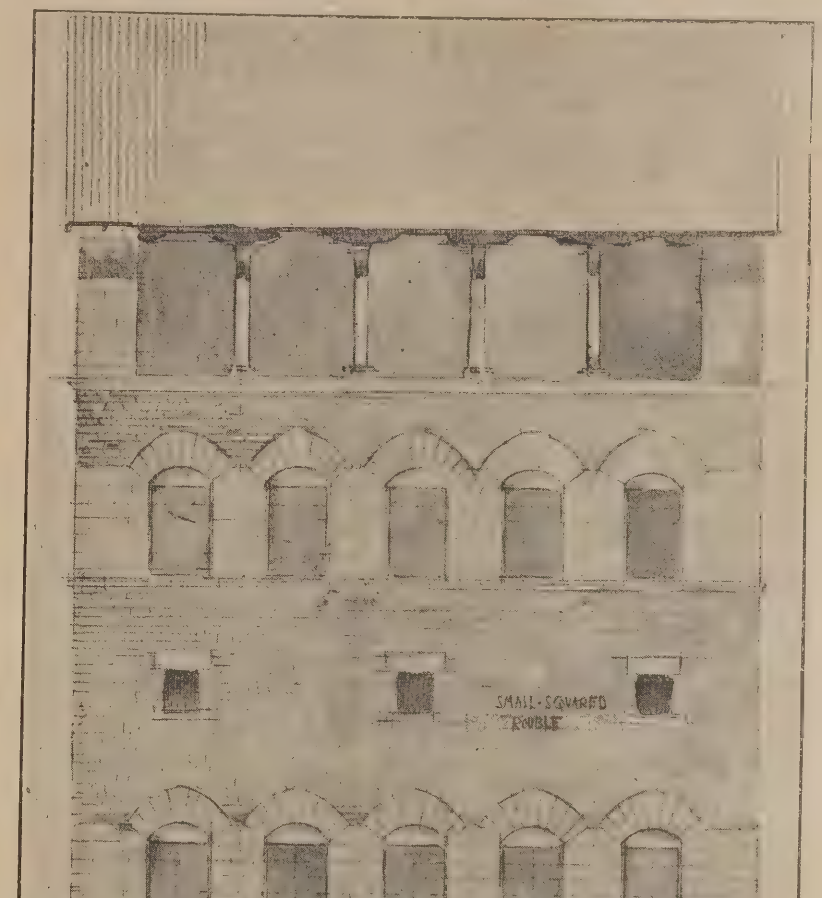
OUR NEW SERIES.

As we announced in our last issue, the "Builders' Journal" is to be raised in price from 1d. to 2d., the new series beginning with our next issue. It will no doubt interest our readers to know that the leading feature of this issue will be a fully-illustrated article on the work of Mr. E. Guy Dawber, F.R.I.B.A.

An Architectural Causerie.

Queen Victoria Memorial. IT is of course impossible to please everyone, and no doubt while many will approve the decision of the special committee to erect the Queen Victoria memorial in front of Buckingham Palace, others will think differently. For our own part we do not consider the site to be altogether a happy one, though we appreciate the difficulty of naming a better one—it would perhaps have been more satisfactory, as we have already suggested, to erect the memorial in Parliament Square, after clearing away those ill-placed statues of celebrated statesmen. However, the Buckingham Palace site has been decided on, for better or worse, and the next matter to which attention is directed is the memorial itself. What form shall it take? And here we meet with a mass of conflicting opinion. It does not appear to us to be at all desirable to incorporate the memorial with the palace front, which (if we might use the expression) would be like putting "new wine into old bottles." It has not yet been stated whether the memorial, if a disconnected work, is proposed to be placed inside the railings or outside. The battle of the styles has lost its fierceness, but there is enough zeal left to ensure a lively discussion about the "style" of the memorial. Shall it be a Classic or a Gothic work, or a creation of the new school of architects? If it is to be attached to or immediately in front of Buckingham Palace, Classic design will become imperative, though if it were more on the Mall Gothic might be adopted. We certainly think that in this matter an imperial competition among British architects should be held, and it is most ardently to be hoped that the memorial will embody the three great arts. At the present time the work done by certain of our sculptors and painters—the younger men—is worthy of the highest praise, and it should receive a prominent place in the great monument to our late revered Queen. One sign is particularly satisfactory. It seems that before deciding in any detail on the style of the memorial the committee intend to ascertain the amount of money that will be forthcoming. We do not desire a repetition of the Albert Memorial, where the gold was plastered on in order to use up funds which had to be spent, though no provision for them had been made at the outset. We believe that half a million of money will be subscribed by the British people, and such a sum ought to be used in the very best possible way. A chance offers itself now for our architects, sculptors and painters to erect a very great memorial, one which posterity will cherish. Will they rise to the occasion?

Rural By-laws. THOSE whose have had experience of the unnecessarily onerous by-laws imposed on the building of houses in the country will read with interest the account (on page 140) of the deputation of eight gentleman appointed by the Royal Institute of British Architects to wait on Mr. Grant Lawson, parliamentary secretary to the Local Government Board. The fact that by-laws appropriate to city dwellings are made applicable to country houses, where the same risks and conditions do not obtain, is sufficiently well known to need no lengthy comment. It is quite an indefensible state of things. For example, the requirements as to fireproof construction are both foolish and unjust. The Institute stated "that a complete and efficient by-law as to party-walls would sufficiently protect each individual from the danger of fire from his neighbour's premises in country places, in uncrowded districts, and wherever streets are laid out with the width and spaces required by the by-laws": and their scheme is for the Local Government Board to arrange their Model By-laws in divisions, and sanction in each district only such as are really needed. The Local Government Board, we are glad to see, recognise that their by-laws ought to be revised, and a Bill will be introduced into Parliament with this object in view. Country builders would then be relieved of several of these most objectionable restrictions and impositions.



PALACE DAVANZATI, FLORENCE. DRAWN BY PERCY E. NOBBS.

WHY GO WE TO ITALY?*

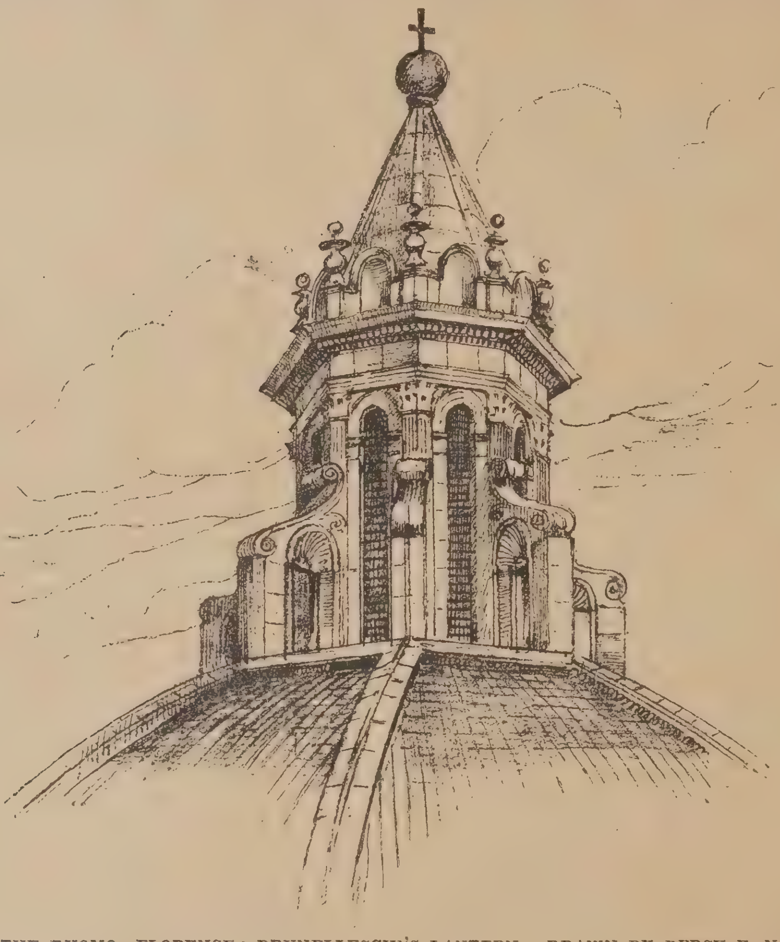
BY PERCY E. NOBBS, M.A.

HAVING had the good fortune last autumn to travel in North Italy for the study of the architecture and decoration there to be found, we feel we cannot do better than put our remarks in the form of an answer to the question, "What went we out for to see?" This treatment of our subject was suggested immediately on our arrival there by the fact that everything was so different from what we had expected. We had imbibed the idea that the land was full of good architecture and that fine taste was an instinct of the people. We found the good mixed with the bad in just the same proportion as elsewhere—gems here and there, usually in unexpected corners, buried in a mass of the most utterly futile, insincere and vulgar rubbishry which depraved taste has ever produced; and our chagrin is not lessened by the fact that good and bad alike are usually very well executed. Our disappointment was rather due to the popular prejudice in favour of the Italians as a nation of artists than to their natural delinquencies. Moreover, we shall touch as lightly as may be on these enormities and confine ourselves to the many phases of superlatively good work we were privileged to see. And when a gem of Italian art is at last unearthed it is well worth the hundred and one difficulties that bar the way of the seeker. These difficulties, we hasten to explain lest we be thought guilty of discouraging travel in Italy, become gradually less as the wanderer becomes more fluent in the language, more used to the ways of Italian officialdom, more inured to the pain of parting with the coin of the realm at every turn, and more habituated to the everlasting delays which the formula "Si, signor, subito" ("Yes, sir, directly") always seems to herald.

But we are getting too general. Our object is to show that Italy is not just what we and possibly others equally exposed to popular prejudice may have thought it was, but that it is the best place for us to go to (after doing our own islands) nevertheless; and as a side issue we shall argue that the architectural work we would study there is not typical of the Italian character, but the work of exceptional men.

Our route lay through Milan, Verona, Venice, Ravenna and Florence, and many smaller places were touched on the way. As work of all periods occurs in nearly every town we shall abandon any attempt at historical sequence in dealing with what we have seen, and shall take things up pretty much in the order in which we have found them.

It is not to be supposed that the foundations of the Italian character to-day are very different from what they were in the thirteenth century. The keynote seems to be a faculty for drowsily existing when not roused and for living at double the rate of the northerner when enthusiasm or interest is stimulated. Your Italian lacks mental stability and seems incapable of acting except directly in response to external stimulus, but then he is like new opened champagne—neither to hold nor to bind—he is all feeling, life, energy. But "self-reverence, self-knowledge, self-control"—these three he knows not.



THE DUOMO, FLORENCE: BRUNELLESCHI'S LANTERN. DRAWN BY PERCY E. NOBBS.

Now Italian art as a whole is the fruit of the live active side of Italian character; in his other state he is incapable of doing anything well enough to be called by that sacred name. All his conscious subtlety and judgment, however, seems confined to his semi-conscious state. When aroused the furnace of his imagination begins to glow and the light of his reason pales before the holocaust of his passion. If roused to admiration, he praises till the gods should blush; if to hate, blood alone will satisfy him. So in art, he is ever prone to overdo the matter he has in hand. Blessed with eyes and hands which as instruments are well-nigh perfect, your Italian as a rule lacks the mental qualities without which the most subtle appreciation of form can lead to naught. No, the Italians are not a nation of artists, and probably never were. And all the great architects of the Renaissance were eminently gifted with very intuitive qualities of mind.

Before answering our main question, "Why go we to Italy?" it may be well to touch on what constitutes the architectural pabulum which the student would fain find and digest. When travelling for study there is a pretty constant strain on the critical faculties. We all agree that there is no use wasting time and energy studying bad work. To define it is not an easy matter, however; what goes into that category depends largely on personal taste and training; still there is in art as elsewhere a distinction between good and bad, and it has already been hinted that Italy is particularly well provided with examples to which the latter epithet is applicable. Moreover, Italy is peculiarly rich in objects of mere antiquarian or historical interest, which are thus, as it were, hoisted up on a pedestal before us. In ninety-nine cases out of a hundred the artistic qualities of such objects are vastly overrated. To the man about to travel in Italy we would say "Beware! take these things for what they are worth; weigh their beauty in the balance of your reason and ignore the other interest, except it attach to the personality of the artist." True, the why and wherefore of a thing often depend on its history; but in Italy circumstantial and accidental historical interest of dubious origin is very apt to give undue prominence to inferior work, and it is the charm of Italy that there is plenty of good work in out-of-the-way corners quite unexploited or written up. Long may it lie hid to give zest to the otherwise very weary labour of an architectural tour.

Of course the first phase of Italian work with which we came in contact was the semi-domestic modern style in vogue in the hotels. Here the plague of feigned mouldings first assailed our eyes, and after suffering many shocks and a few take-ins we came to the conclusion that there were no two ways about the cleverness of the execution or the wickedness of the perpetrators. We take this opportunity of denying that the Italian school of feigned architectural ornamentation has any claim to be regarded as decorative art. We have often been deluded by its cleverness and shocked by its daring, and we have occasionally been sardonically amused by its impertinence, but never have we experienced the faintest gleam of pleasure even from such stupendous efforts as the ceiling in the Church of the Ognisanti at Florence. It is salt that never had any savour.

The Italian tradesmen are rather a puzzle to us. The fashioning of stone, whether marble or coarser material, is invariably good, the rougher dressings often presenting charming textures. In joinery, on the other hand, your Italian is far behind his brethren here. His work in this respect is characterised by slovenly fitting and an utter want of "gumption." Italian plaster work is nearly as debased as Italian decoration. The chief vocation of the plasterer is the imitation of materials superior to those actually in use. To his credit let us add that some of his mixtures seem imperishable and indestructible, but we could not find out the specifications for them for love or money.

To leap back 800 years, the pre-Gothic work of Lombardy and Tuscany—if we may be pardoned for so sudden a shift from the ridiculous to what is often not far short of the sublime—affords us countless examples of a simple arched construction giving most excellent effects, especially internally, where a dignified and spacious solemnity is the rule. Externally impressiveness is due to mass and scale alone, the busy treatment of banded marbles and blind arcading, however picturesque and beautiful in colour, being in many cases exceedingly distracting owing in a measure perhaps to the casual and capricious schemes of proportion. One external treatment of wall faces seems very happy. The wall is banded in two colours in the usual way; a strong plinth or base course and the cornice are connected by pilasters or little buttresses at frequent intervals. These for a 30ft. wall head often do not exceed 6in. in width with a 4in. projection. The banding runs right through the pilasters. Thus we have the horizontal stripe broken by the shadow and perspective of these slim verticals, and when this treatment occurs on an apse of tall proportions, and the sweep of the banding

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[*] A paper read before the Edinburgh Architectural Society on February 27th, 1901.

and varied angles of the breaks comes into play, one of the most charming effects possible in plain stone masonry is at once obtained.

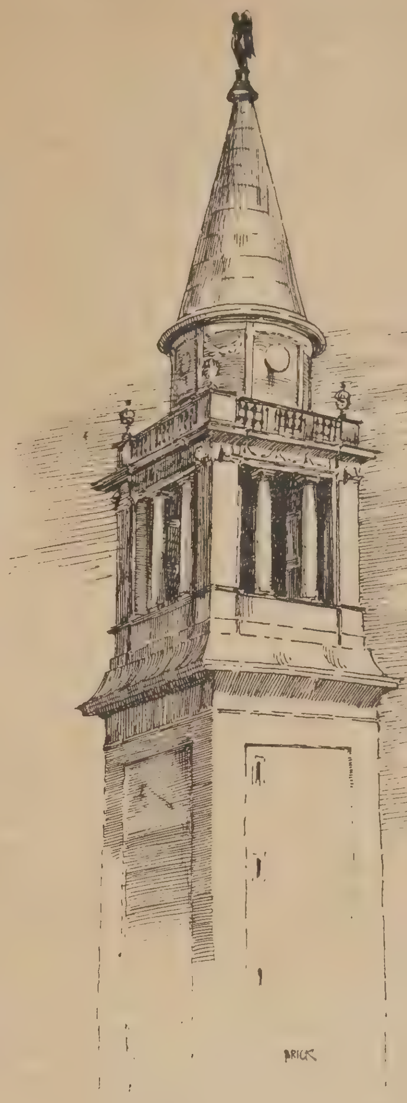
To pass on a stage, we next deal with the thirteenth and fourteenth century Italian Gothic. My readers are no doubt all aware that in Italy Gothic art as a system of construction never obtained at all. Street, in his famous essay on the thirteenth century in Italy, points out that the only works of this period in Italy possessing architectural qualities were the work of foreigners. Italian Gothic was a mere decorative fashion, and it is not too much to say that wherever ambition is shown failure is proportional thereto. Gothic was evolved by the cool-headed intellectuality of the North. It was a seed designed to thrive in a temperate climate on a firm light soil; beneath the fervid sun of Italy, on clay rich with undecomposed traditions, a rank growth was inevitable—the riot of autumn was in its verdure before the fruit had set. Exquisite detail and thoroughly feeble design are the main characteristics.

A glance at the Cathedral of Milan, or at the way in which the windows of the Duomo at Florence occur regardless of the design of the marble panelled wall facing, will bear out what we mean. Here we have not the accidental charm so frequent in our own Gothic, but deliberate want of consideration—stupidity, and this is characteristic of the Italian architect whenever a departure from the ruled formality of mere façading sets him free. He does not regard a difficulty as a thing to be overcome with grace, but just cuts off an arcade anywhere or botches an awkward angle in a most petulant spirit.

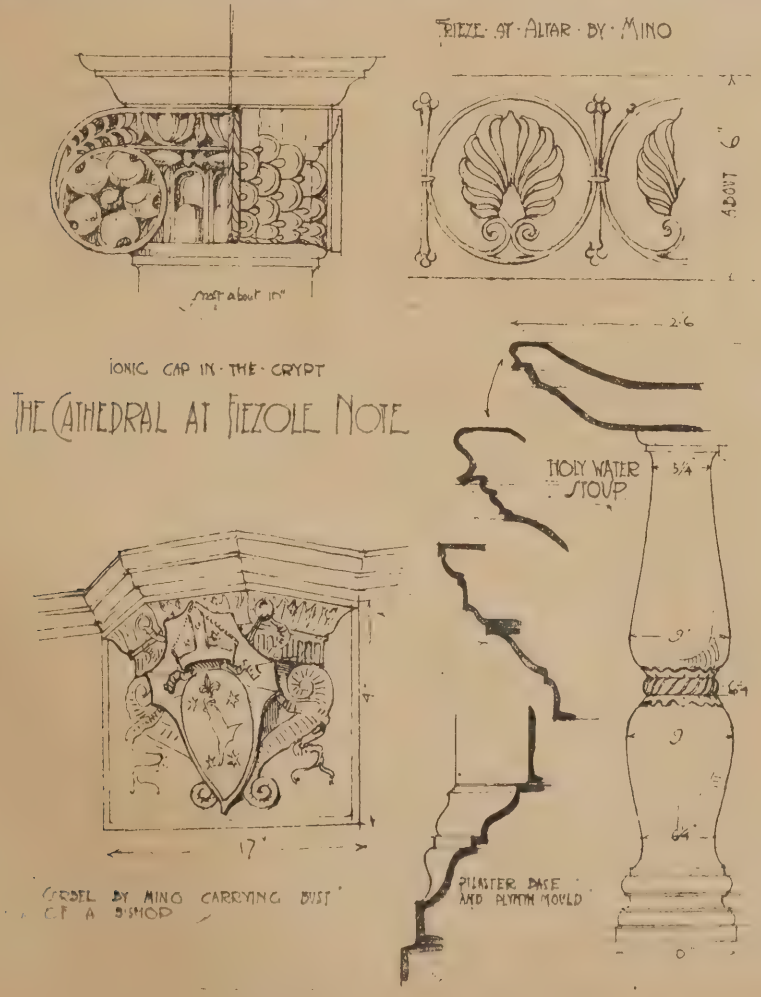
What some Italian Gothic churches do teach us is the beauty of simple but emphatic form. There are at Verona several plain brick churches of the most charming and dignified proportions, externally and internally fine and spacious. The inspiration for St. Agnes, Kennington, by the younger Scott, and for Pendlebury Church, near Manchester, by Mr. Bodley, seems to be derived from this school of work. Simple to a degree in form and detail, their plain brick walls sparingly broken by window openings or stone dressings, and their horizontal massiveness relieved by the repeating shadows of the slim straight buttresses, these churches possess eminently that charm of austere beauty which has its very foundations in sincerity of design and which, alas! so seldom obtains in the sacred buildings of Italy. On the question whether these are works of architecture in the sense that their constructors tried consciously for the effect attained so happily, or merely examples of exteriors left to look after themselves and "turn out," we shall not venture a definite opinion, but we suspect the latter to be the correct surmise. There they rise, these great red churches, sheer up like ships at anchor amid a sea of red roofs, each with its stately campanile guarding it hard by, and above them all the queen of clock towers shoots up into the blue—the Campanile del Municipio, calmly recording the gentle flight of time in spite of the protest of the rushing Adige, for in Verona there is no hurry outside the bosom of the stream. There they stand, whether works of conscious or unpremeditated art it matters not—a sufficient reason, indeed, why all who would build truly and well should hie themselves off to Italy to see them.

We cannot leave Verona without a word on the works by Sanmichele there. Two or three façades, an unfinished tower and the famous gates in the city walls are the chief works he has left his birthplace. These gates are superlatively fine examples of the forcible and stern in building. The great rusticated archways knit their brows not in a savage scowl but in a firm determined frown. The lesser openings, contracted to their minimum, echo in a shriller key the sentiment of the main portal.

Rustication in Italy is invariably more or less roughly dressed—polished rustication, so common and perhaps necessary in our smoky cities, was there all but unknown in the fifteenth and sixteenth centuries, when it was the custom to hammer-dress or leave entirely natural the body of the stone, though the joints were carefully wrought. In fortified work, cubic stones wrought with intersecting bellied rustication showing a saltire mitre are common, and we find entire façades at Ferrara and elsewhere faced in this manner. The most extravagant rustication known is at the Pitti Palace, in the plinth of which blocks occur showing a face of 14ft. by 2ft. 3in., projecting more than 2ft in places. In the work of Sanmichele the blocks are flat on the face and rounded not too finely into the joints, which are executed with great care.



CAMPANILE OF SAN GIORGIO MAGGIORE, VENICE, FROM THE LAGOON.


FRIEZE · OF · ALTAR · BY · MINO
ABOUT 6"
most about 10"
IONIC CAP IN · THE · CRYPT
THE CATHEDRAL AT FIEZOLE NOTE
2·6
HOLY WATER STOUP
3/4
9"
6¼
9
6¼
0
17"
4"
CORBEL BY MINO CARRYING BUST OF A BISHOP
PILASTER BASE AND PLYNTH MOULD

We spoke just now of the campaniles of Verona, and it is an interesting fact showing the power of local traditions in architecture that each district in Italy has its special type of tower, just as at home we find special characteristics in the towers of Warwickshire, Lincolnshire, Northamptonshire, Oxfordshire, and other districts. Round Venice there is one recognised type of which the fine tower of S. Giorgio Maggiore is a good example, varying from the traditional form only in having a circular conical roof and in the heavy sweep outwards above the main cornice. Further west the circular conical roof, composed of bricks semicircular in plan at their exposed ends, is all but universal. Dr. Anderson, as we all know, has adopted this type for his tower at Free St. George's, Edinburgh, with less reason perhaps than did Palladio for S. Giorgio, Venice, but with quite equal success—indeed, we did not see the Edinburgh example excelled anywhere in its native district.

Venice has many lessons for us in spite of the altogether unique conditions there prevailing. Much of Palladio's best work faces on her canals, and as English seventeenth-century work owes so much to this master, the study of his dignified, restrained, but somewhat frigid manner must help us to understand our own developments on these lines. Many of his Venetian façades are experimental, and of these not a few are failures. The problem which seemed to trouble him was the mingling of a main and subsidiary order for doors, &c., in the same style. This is beautifully solved in the case of the nave arcade of S. Giorgio Maggiore, where the main order is on a pedestal. Note in the accompanying sketch the way in which the base of the lesser order and the plinth mould of the pedestal combine. Here the question is, of course, complicated by the arcading. In some cases the lesser order is elevated on a podium and sometimes the bases of both line, but there are objections to both practices. Into the many dodges or "'cute fakements" of this master we cannot now enter. They can only be studied with profit in position, and thus we have another excellent reason for going on pilgrimage beyond the Alps

On St. Mark's we shall not dwell at any length, because, in a practical sense, it is useless to English architects. We are of those, however, who hold that the study of a theme has educational value inversely as it possesses practical utility. St. Mark's is for us a place in which to sit down and look, and the more we ook the less are we inclined to rise and go. Few interiors can so whet the appetite for their own consumption. Gorgeous, rich and sombre, it is rather picturesque than beautiful, being eminently formless, and hence, perhaps, its mystery. As architecture, it is big with the bigness, not of the vast, but of the clumsy, and we can see little thought in its conception as a building; but this is amply compensated for by the pains lavished on the wall-covering of marble veneers and storied mosaics. But Ruskin has told it all as well as it ever will be told, so we will out into the sun and see the outside. Here the restored mosaics set the teeth on edge with their vulgar debauch of colour. There is much excellent marble veneer, so that the beauty of the material provides a perfect feast for the eye, happily distracting the attention from a critical study of the architecture. We fully acknowledge that when colour is introduced into architecture form must play a less important part in the composition; but this should be in the nature of simplification, not a general deterioration of proportions as here exemplified. In Byzantine work we usually find the above principle accepted and acted on. Great wall surfaces are provided for marble or mosaic decoration. Mouldings almost vanish from the work, occasional small strings chamfered and enriched with a block, or a running pattern sunk in the face, being all that here represents the most potent means for architectural effect, after the proportioning of parts, in the more sombre styles. This general formlessness, however, which is necessary when materials of great intrinsic beauty are employed, is in no way incompatible with the fine proportioning of the structure, which is behind all surface things the soul of architectural design, and of which we have excellent proof in the lesser Byzantine churches near Venice at Murano and Torchello.

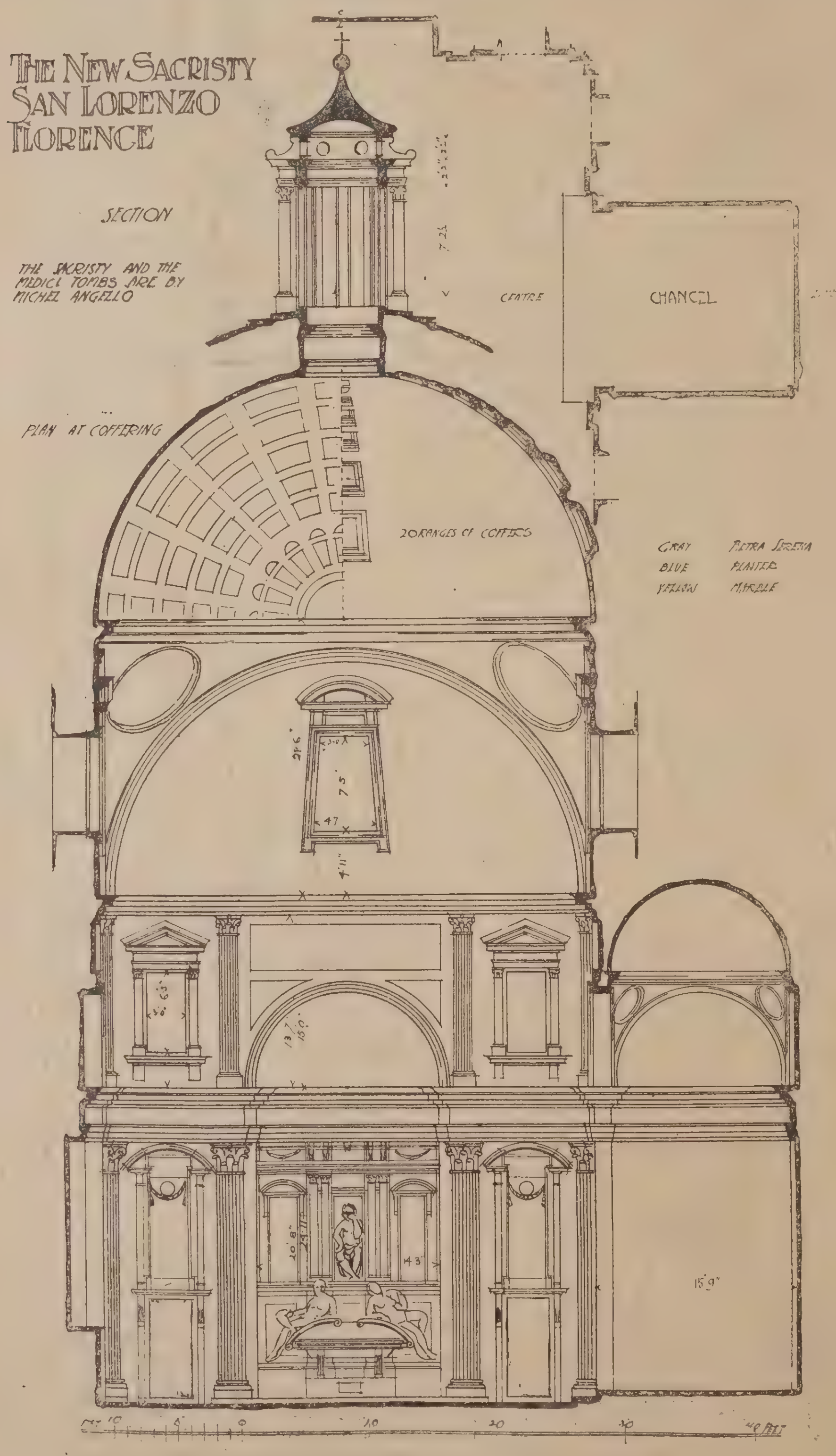
The St. Mark's mosaics, though far inferior in every way to the Ravenna examples from the fifth and sixth centuries, are most worthy of study as a decorative scheme. The arrises where arches or groins occur are always bull-nosed, the mosaics being carried smoothly round; the form of the vaults is only sometimes emphasised with borders or running patterns; usually the gold cubes are carried round the bull-nose and reflect more or less light from all points to all points, and so a soft gleam of radiance shows where soffit and pendentive coincide.

It is impossible to refer to Italian mosaics without lodging as strong a protest as possible against the wholesale reconstruction of these invaluable examples of a unique and glorious phase of decorative art at Ravenna. The procedure of the restorers now at work is to knock down the old work and re-execute the designs as far as may be in new glass (drawing on their imaginations where gaps occur). The work is certainly being well done by capable artists, but such restoration destroys the authenticity entirely. Moreover the old cubes were often very small and have a mellowness not possessed by the new ones. The restorers assure us that they are matching the original colour of these weathered cubes: perhaps they are—we prefer the weathered tints, and the use of larger cubes has only rapidity of reconstruction to commend it.

Passing now to Florence—the most beautiful town in the world and the birthplace of modern architecture—the student feels himself at once face to face with a big personality—Brunelleschi. His lesser works meet us on all sides testifying to his industry, and his great dome pervades the whole city, yes, and the hills around. Go where you will in Florence it is ever within your ken. From the Fiesole road or any of the heights, from up the river or from down the river, it is ever the centre of interest in the enchanting scene on which we have had the privilege to gaze. There are other great domes in Florence, but mere pigmies by the side of this serene giant. Tall and straight beside it Giotto's Tower soars into the bright clear air, beautiful as a slim girl is beautiful, and trivial a little, yet losing nothing by comparison but rather gaining by contrast with the vast dome behind—the two serving but to accentuate, on the one hand, grace, and on the other, grandeur. Suppose we walk to the Piazza del Duomo from the cypress-lined vista whence we saw it just now, across the vineyards and olive gardens all russet and dusky in their winter dress. As we enter the town the great dome shows at intervals when the narrowing streets point that way, rising, ever rising, above the nearing roofs and chimneys, till at last we see it at the end of a straight street blocking out the very sky, and the eaves of the tall houses and grim palazzi in steep perspective point little above the basemould of the mighty pile.

And now the glorious colour of the tiles begins to tell in all its mellow charm—dull flushing red lined with long weather stains—and the sweeping curves are crisply shown on the angles where the eight great marble ribs converge to bear the dainty lantern now gleaming pink in the waning light.

At last a man in whom the native enthusiasm was tempered by a balanced intellect had sprung up among Italian builders. In his work there is more of a great individuality than



MEASURED AND DRAWN BY PERCY E. NOBBS.

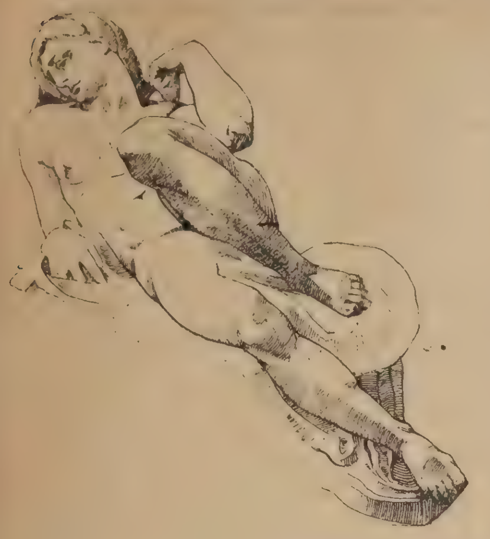


FIGURE OF DAWN, MEDICI TOMBS, FLORENCE.

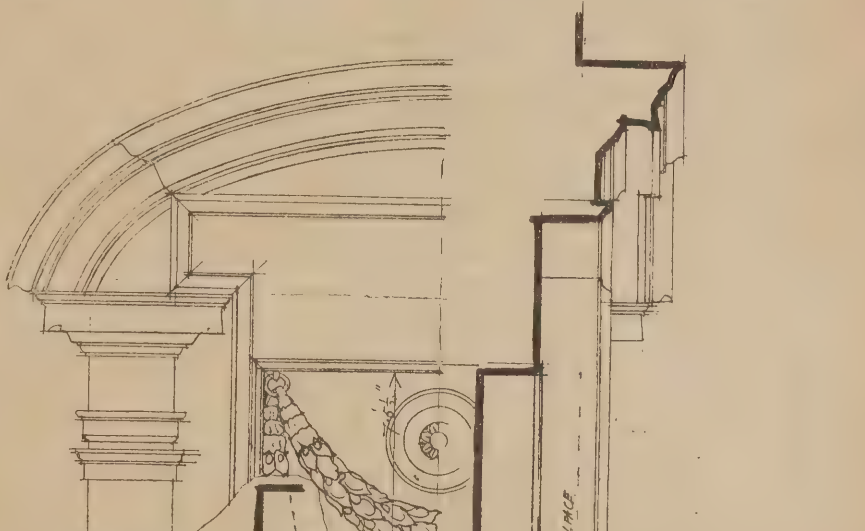
of the classic traditions he studied with such loving care. The first great modern exponent of style, in the real, live personal sense, independent of conventions and manners, in which Viollet-le-Duc so rightly understands the term, had arisen, and the practice of modern architecture as a profession and an art became assured.

Over and over again does Brunelleschi show us (most notably perhaps in the church of the Badia at Fiesole) that perfect architecture can be composed independent of coloured marble or carved ornament; yet, when so minded, with what taste and judgment does he apply his decorations and what exquisite beauty of design and execution does he attain in them! Ornament was undoubtedly the pitfall of the Italian architects, and it is hardly too much to say that more buildings were spoiled than improved by embellishments in themselves most beautiful. As ornamentalists the men of the Cinquecento or sixteenth century were supreme, and the study of this charming school of work is to-day the main attraction for the student of architecture in his pilgrimage to Italy. The best work of this style was really done from 1470–1500, and when we say it reaches the same high level attained by English work in that brief period of perfection, 1300-1370, there is nothing left to be said in its praise. Mina da Fiesole was, perhaps, the most famous stone carver of the period, but when we remember that those versatile artists, Donatello, Brunelleschi himself, Ghiberti, and Andrea della Robbia, were all decorative sculptors, we can appreciate the reasons for the general excellence. We are all familiar with this type of ornament—our schools are full of it (often to the exclusion of other equally worthy things), but what we wish to insist on is the need to see these things where they grew, in the "pietra serena," or creamy marbles, that gave them birth. Thus to have seen and felt the beauties of a bygone style must ever impress on the mind a standard of excellence, unsurpassable indeed, yet to which it is possible to attain in the work of to-day, even without imitating the phenomena in question. Beauty in ornament depends on the spirit, the imagination, and the execution of the work, and is not monopolised by any one school; yet nowhere in the world are these qualities to be found in stronger essence than among the tombs, pulpits, galleries, portals and fountains which grow in as natural profusion in the sombre aisles of Italian churches as do the vine and olive on the terraced hillside or the plain beyond the city wall.

The old street architecture of Italian cities is always picturesque and charming, and every town has its own types and idiosyncrasies. Some of the brick palazzi of Ferrara with strong bold terra-cotta cornices and entrance doors, emphasised with some daring play of archway column and cornice, seem to evidence the limit of dignity obtainable in what must ever be regarded as a material inferior to stone for monumental expression. The Florentine examples possess a yet finer type of dignity, though the scale frequently suffers from the size of the blocks and the enormous proportions of the storeys. The Strozzi, Riccardi, Ruccillai, and Pitti palaces, of which it is superfluous for us to carol the praises, do not represent the vernacular architecture, being examples of exaggeration of the local manner of their time affected by architects very consciously and very successfully striving after effect.

We have in the accompanying rough elevation sketch of the Palace Davanzati a far more typical example. The great dignity of this façade depends on the extremely simple architecture, which gives full prominence to the proportions and the charming textures of the masonry, the variety of which seems to tempt the eye to explore each surface, with the result that the bigness of the thing becomes very apparent. That, we take it, is the latent power in the various kinds of rubble and ashlar facework which we are only too often accustomed to specify without any regard for their scale-giving natures when rightly employed. The various dressings are noted on the sketch. The severity of the scheme is relieved, while at the same time the monumental effect is heightened, by the enormous cartouch on the first storey, which is near enough to the passer-by to be readily compared with the human unit of scale. Had it occurred at the top of the building it would lack this faculty of linking the bigness of the whole with the smallness of the creature that built it. But this is only one of many Florentine examples of simple buildings adorned by the light of pure reason and subtle proportioning, and absolutely innocent of constructed adornments and the four blessed orders, and, best of all, entailing no fraud on the beholder. How many modern street fronts could plead not guilty on this last count? There are probably no streets in the world where one can better study the inherent beauties of stone construction than in the shady lanes of Florence; and how it comes about that the same breed of men who built these honest old walls came to be responsible for such extreme crudities as some of the church façades of the same town evince passes our comprehension. The Italian character has always shown itself capable of splendid infamy—perhaps this is the architectural statement of the same fact.

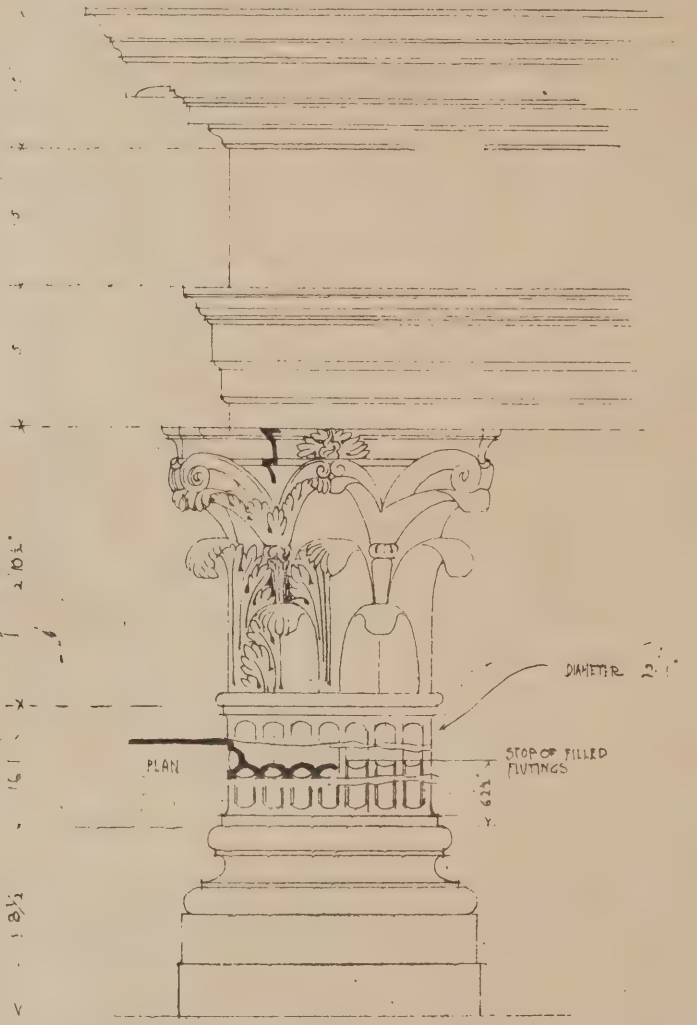
The Renaissance in Italy, as far as the architect is concerned with it, culminates in the wonderful works of Michel Angelo, and though well aware that it is an impertinence to attempt to say anything about so great an artist in the few moments at our disposal, we feel these notes would be very imperfect without a word about so potential a force in art since his day to ours and on through the ages to come. It not infrequently happens, in other walks of life besides the practice of the arts, that a very great exponent may exercise a prejudicial influence on his branch of human activity by exciting the emulation of less capable followers in schemes too daring for



THE NEW SACRISTY OF SAN LORENZO, FLORENCE: MICHEL ANGELO'S DOORS.

their powers. Such we reluctantly pronounce the influence of Michel Angelo to have been. To consider one of his works—the new sacristy of San Lorenzo. It is here that the Medici tombs stand mutely eloquent to the public of the glory of the Medici—to the student of perfect skill—no! we hold the truth is quite other—to the public they proclaim the glory of Michel Angelo's cunning, and to the other section of mankind the shadow of the rock on which civilised taste was wrecked.

The sacristy itself affords an example of fine simple classic detail in "pietra serena," the "non-architecturalised" portions of the walls being plain white plaster. The domed interioe is of very tall proportions, there being onn order or storey more than is usually found is buildings of its class. The acoustic propertier of the place are terrible. The whole interior struck us as so interesting that we measured it up as the surest way to come to any conclusions on its merits. So far there is nothing extraordinary, but the virile quality of the detail makes it well worth the trouble of reaching.



THE NEW SACRISTY OF SAN LORENZO, FLORENCE: THE MAIN ORDER.

There are eight doors to the floor of the building, six of which we suspect of never having been opened; all are architecturally treated with a square-headed niche above enclosed in a curved pediment in white marble. The proportion of these highly-organised features is altogether excellent, and the detail and execution quite irreproachable; but is the interior one whit the better for having eight of them? This part dates with the building, 1523-29; the tombs were not placed till about fifteen years later. There is, moreover, ample internal evidence in the detail to suggest several years between the design of these doorways and the screens behind the statuary of the tombs.

We must say at the outset that in all the realm of art, detail containing more exquisite enrichments has never been designed or executed. In the profiles we see nothing worthy of imitation—the familiar classic forms have all been strained and improved upon in a spirit so adroit that the plotting of the actual sections causes a shock—they are so very unlike what they look. We had frequently heard this architectural background damned with faint praise here at home, and concluded it was unimportant. This was quite a misconception. The quality of the execution and extreme originality and cunning of design show that the master was doing his utmost—the architecture was no mere adjunct of the memorial—it was in its way as laborious in execution and as full of intellect as the superb statuary which ranks with any sculpture in the world. The only solution we have to offer is that as an architect Michel Angelo was an amateur. His great powers as painter and sculptor gave him architectural opportunities to which he was not capable of rising, though no mean exponent of ours, the mother art. We have in him the Italian character aggravated by the energy and power of a giant evincing itself in a genius nor merely impatient of, but incompatible with, the idea of restraint—and was good architecture ever produced where restraint had no place?

In these architectural backgrounds the triviality of the scale, which constitutes their worst fault after the artificiality of the design has been admitted, may perhaps be accounted for as a conscious attempt to add scale to the sculpture Be this as it may, we feel their effect as a whole to be unfortunate, and the importance we have given to this conclusion is justified by the very pretentious nature of the work; we repeat it was meant to be the best up to its date.

We had not the good fortune to see Rome, and so will not express an opinion on the legitimacy of the scheme in the Sistine Chapel. Of the terrible effect on architecture of this venture no one who has travelled in Italy can be in doubt. We suspect the scheme was embarked upon to show the power of the artist rather than in a proper spirit of decoration. The next generation seem to have treated the work of decoration in a still lighter vein—as an amusement. Feigned architecture is now the traditional decoration of the Italians, and no words can convey the baseness of the architecture so feigned or the puerile silliness of its application.

In conclusion, then, we hope that good reason has been shown why the Italian tour should be undertaken in spite of the general strictures we have felt compelled to pass on Italian taste both of to-day and of the great periods of the past. Apart from the mere development of critical faculty and judgment which the seeing of great quantities of architectural or any kind of work must engender, modern architecture can best be understood by knowing how it grew—and it was in Italy that this took place. Here a couple of streets will often show us far more clearly than any couple of volumes could how men began to build for effect combined with use how they went on to build for effect only; how grandeur first real became in a few generations grandeur merely simulated; how designers tried to be funny in the days of the rococo, and how they have ended by being only vulgar at the close of the nineteenth century.

Apart from thus having the pages of architectural history unrolled in living stone before us (and especially those interesting pages of the fifteenth and sixteenth centuries which are the key to all that happened since, excepting the Gothic Revival)—apart from this we have in Italian work of every century carving and decoration of a standard never excelled, and equalled elsewhere only for brief bright periods. Never before did we realise how little decoration and architecture had to do with each other. The finest Italian architecture is devoid, or almost devoid, of embellishment, and we are forced to the conclusion that great excellence in decoration militates against architectural design either in a nation or an individual. We do not mean to suggest that great beauty of ornament is incompatible with good architecture in any way, but when they are combined—as they have only been on rare occasions (when we look at things in their true proportion and think how little wheat there is among the chaff in the cities of this world)—when they are combined the result has been so astonishing that the whole world recognises it. Italian ornament is a matter so fascinating that it is positively difficult to restrain the temptation to go and do likewise for the sake of its very sweetness. But if it is to do us a whit of good it must be studied in spirit as well as be put down on paper; and such is its subtlety and delicacy, so dainty and magical its use, that we promise the brains and eyes and fingers of the happy students of next year a rare treat. As we find it in plaster in our museums it is only the eyes and fingers that have any good of it—these things must be seen in position.

A new Church at Foulridge is to be erected at a cost of over £5,000.

A Rowton House in Italy.—A deputation from Milan came to this country some time ago for the purpose of inspecting the Rowton Houses in London. They were furnished by Lord Rowton and Sir Richard Farrant, the managing director of Rowton Houses (Limited), with full details of the construction and working of the company's houses. A limited liability company (Societa Anonyma) was shortly afterwards formed in Milan under the title of "Alberghi Populari" to "erect and carry on hotels for persons of small means similar in all respects to the Rowton Houses of London." This company has just completed the erection of one of these houses, containing 600 rooms, in the centre of the city of Milan, at a cost of over a million lire (£40,000). Not only have the details of construction of the London houses been adopted, but the fittings and furniture are precisely similar. The house will be opened in the course of the next few days, and will be managed upon English lines. The price to be charged will be 50 centesimi per night, or three lire and a half weekly, as compared with 6d. and 3s. 6d. respectively here.

DILAPIDATIONS.[*]

By W. J. JENNINGS, F.S.I.

THE subject of this paper may be thought to come more within the province of the surveyor than the architect, and, doubtless, strictly speaking, this is so, but to many country members of this Society the various, and in many cases, intricate questions arising in the relation of landlord and tenant have to be dealt with in the ordinary every-day practice; so that a paper may be of some practical use.

That the subject is worthy the consideration of architects may be inferred from the fact that as long ago as 1842 a Committee of the Royal Institute of British Architects was appointed "to investigate and report upon the practice in valuing dilapidations and on the state of the law by which such valuations were affected," and although many legal decisions bearing upon the question have been given in recent years, though many papers have been read at the Surveyors' Institute and many books published by lawyers and surveyors, the report of the Institute Committee contains most useful practical information, and will be found to be of great assistance in acquiring a proper appreciation of the subject.

It must not be expected that within the narrow limits of a paper the subject can be exhaustively dealt with; at the most, some of the matters falling under the head of dilapidations can only be referred to very briefly; and one of the most important divisions of the subject, namely, ecclesiastical dilapidation, will not be touched upon for the reason that the various questions arising under the Ecclesiastical Dilapidations Acts are, by the great importance of the subject, entitled to, and on some future occasion may form, the subject of a separate paper.

It is proposed to discuss shortly the general principles applying to the common law liability to repair, as applied to a tenant for years and a tenant for life, though this might be thought to be more a matter for lawyers than for architects; the greater part of the paper will be devoted to the principles and practice of surveying and valuing dilapidations to buildings arising under the more common forms of covenants entered into by landlord and tenant.

Dilapidation Defined.

Dilapidation is variously defined One of the best definitions from the architect's point of view is that given in the report of the committee appointed by the Institute, previously alluded to; it is there stated that "dilapidations are in usual practice considered to be those defects only which have arisen from neglect or misuse, and not to extend to such as only indicate age so long as the efficiency of the part still remains; but if the effects of use or age have proceeded so far as to destroy the part, or its efficiency in the structure, this argues neglect or misuse, it being the presumption that at the commencement of the term the tenant was satisfied that every part was sufficiently strong to last to its close."

Dilapidations arise from waste, either voluntary, permissive or malicious, the term "waste" being thus defined by "Grady": "Whenever there is a particular estate in lands or tenements which must, after the determination of such estate, devolve upon another, any defect in their condition is properly dilapidation, and the act of permitting or committing such defect is called waste."

It is necessary to consider "waste" in some detail and to refer to the principal divisions which are, as stated above, voluntary, permissive, equitable or malicious. There is also ameliorating waste, as to which the architect is not often troubled. Of these the first two divisions, *i.e.* voluntary and permissive waste, are of great practical importance to the architect, being the kinds most prolific in disputes.

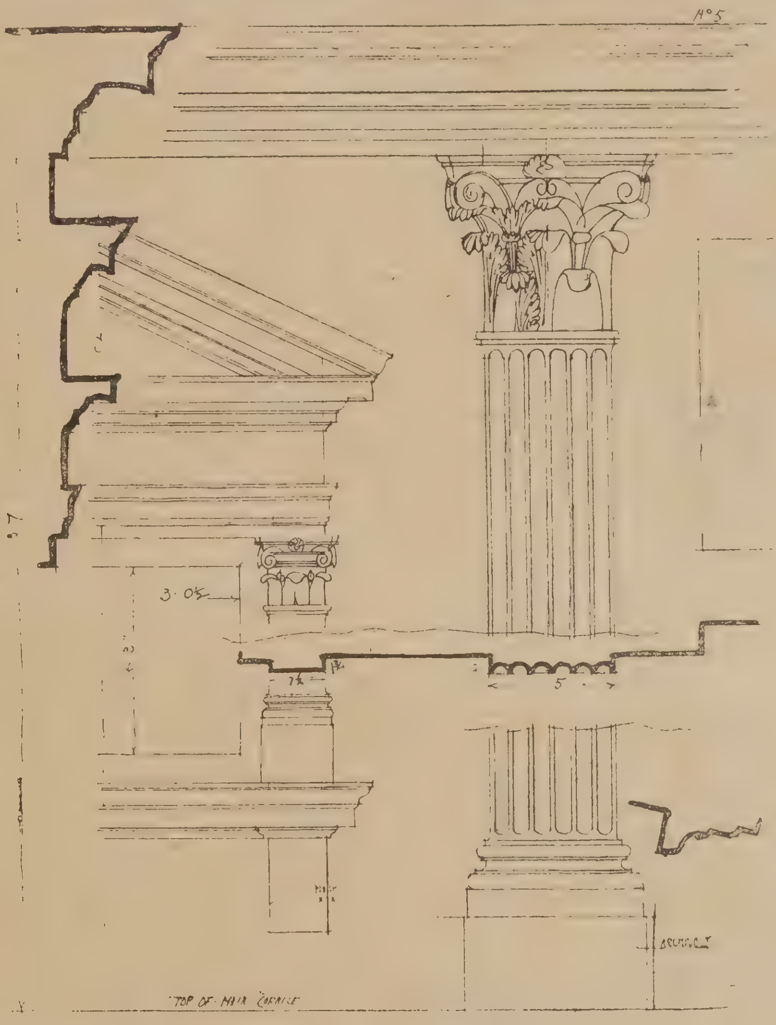
The Four Chief Kinds of Waste.

Voluntary waste is actual or commissive, as by felling timber, pulling down buildings or altering their structure, removing wainscoting or other things once fixed to the freehold, opening mines or pits—in fact whatever does a lasting damage to the freehold or inheritance, the kind of damage that is sometimes provided against by express stipulation in the lease, such, for instance, as not to convert a house into a shop.

Permissive waste is a matter of negligence and omission only, as by allowing a building to fall or rot for want of necessary reparations—the kind of damage which, under a lease, is invariably provided against by express agreement to repair.

Equitable or malicious waste consists in acts of gross damage, usually the cutting down of ornamental timber by a tenant without impeachment of waste.

Ameliorating waste is such voluntary waste as improves the demised premises; such, for instance, as where the tenant puts a new front to his house. In respect to such waste it seems that unless substantial damages be proved the tenant will not be interfered with by injunction.



THE NEW SACRISTY OF SAN LORENZO, FLORENCE: THE SECOND ORDER.

Having considered the meaning of the terms, "dilapidation" and "waste," it is proposed to consider the obligation of landlord and tenant under two heads, namely:—(1) The obligations imposed by the implied covenants under the common law; and (2) The obligations imposed by the repairing covenants in the lease.

Implied Liability to Repair.

First then with regard to the implied legal liability to repair under the common law. Generally speaking, the lessor is under no liability whatever to do repairs. The general principle governing the case is that landlords are not liable to tenants in any way; the burden of repairs has always, by the spirit of the common law, been thrown upon the tenant, for by letting an unfurnished house the lessor does not thereby imply that it is reasonably fit for occupation or that the house will last out the term, or that it will receive proper support, nor is the landlord bound to rebuild in case of fire, though the rent would still be payable. Where, however, the premises become subject to a structural defect, such as the drains, which may give rise to a nuisance or be dangerous or injurious to health. the tenant may, if the steps directed by the Public Health Act be taken, throw the liability for this repair or removal (in the absence of any agreement relating to the matter) upon the landlord. There is an exception to the rule that the lessor is under no liability to a tenant in the case of small tenements, for under the provisions of the Housing of the Working Classes Act (53 & 54 Vic., c. 70) a warranty that the tenement is reasonably fit for habitation is implied in the case of tenements let to members of the working classes at rents varying according to the locality; thus in London the rent must not exceed £20, in Liverpool £13, in Manchester and Birmingham £10, elsewhere in England £8, in Scotland and Ireland £4; but the landlord may contract out of his liability under this Act, and in practice it is found that he generally does so.

It often happens that during a tenancy the drains prove defective, possibly causing illness, expense and death, but if the landlord has given no undertaking in the form of a guarantee that the sanitary arrangements are satisfactory he cannot be called on by the lessee (except as stated above) to put right what is wrong, nor to recompense the tenant for the expense and loss he has sustained. Of course, if a representation has been made that the drains are satisfactory, although the undertaking is not in writing, it may be a different matter and the landlord might be liable, and as, generally speaking, tenants ask about the sanitary arrangements, care should be taken in replying or it may be found that a guarantee can be construed. If the premises are let furnished it is an entirely different matter, for in that case there is an implied covenant on the part of the lessor that the house is in a fit condition for immediate occupation.

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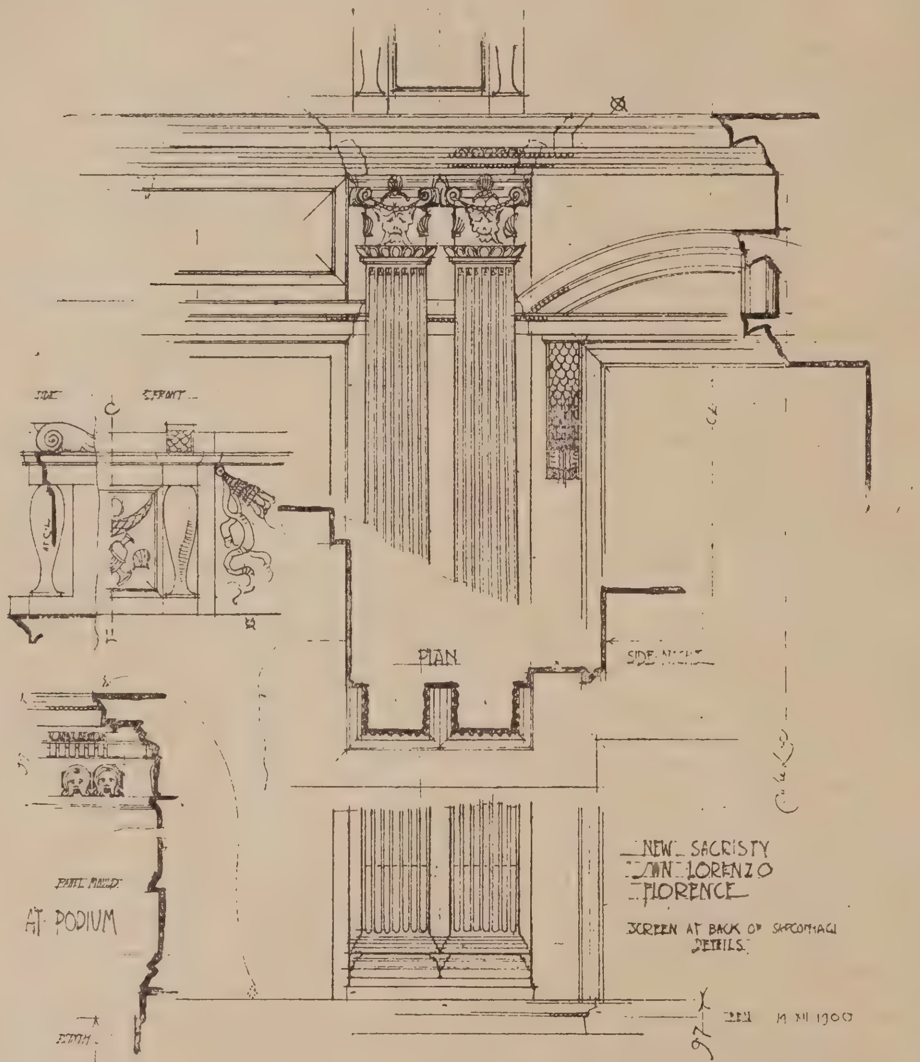
[*] A paper read before the Society of Architects on March 21st, 1901.

A Leading Case.

One of the leading cases on the implied covenant that a furnished house is fit for immediate occupation is that of *Wilson and Another* v. *Finch-Hatton* (Exchequer Div. 2, 1876-7). In this case the defendant agreed to rent the plaintiff's house for three months from May 7th, but having at the beginning of the tenancy discovered that the house was, owing to defective drainage, unfit for habitation, he refused to occupy it. The plaintiffs immediately set about repairing the drains, and on May 26th tendered the house in a wholesome condition to the defendant, who refused to occupy or to pay rent. The plaintiffs thereupon sued for the rent. It was held that the state of the house at the beginning of the intended tenancy entitled the defendant to rescind the contract and that he was not liable for rent or for use and occupation. The decision in this case is founded on the well-known case of *Smith* v. *Marrable*, generally alluded to as the famous "bug" case, which was decided as long ago as 1843; it decided that it is an implied condition in the letting of a furnished house that it shall be reasonably fit for habitation, and that if it is not so fit the tenant may quit without notice and would be justified in repudiating the tenancy, while if he had incurred loss, he would be entitled to recover damages.



With regard to the implied liability of the tenant under the common law, his responsibility is much greater than that of the landlord. There is the implied covenant to use the premises in a tenant-like manner. In dealing with houses or buildings this obligation resolves itself into one to do repairs of a certain kind, the amount or character of which in the case of leases for years has apparently never been defined with precision, the reason probably being that such instruments almost invariably contain an express covenant which displaces the implied one by the tenant to the same effect.

The Tenant's Liabilities.

It will seem, however, from the authorities that a tenant at will, or a yearly tenant, is bound to keep the premises wind and water tight, but there seems to be considerable doubt in the minds of lawyers as to what this expression really amounts. Woodfall considers that on the whole it is understood that the expression ought to be construed strictly in favour of the tenant, and quotes as an example that the broken glass of windows need not be replaced by new glass, but that the exclusion of wet by boards or other unsightly modes would be sufficient.

In the case of a tenant for years he is liable under the implied covenants for permissive waste, but not for damage by accidental fire. A tenant for life is, in the absence of covenants to the contrary, under no implied liability to repair.

We now pass to the consideration of the second head of the subject, namely, the obligation imposed by covenant.

The distinction as between the common law obligation to repair and the liability as expressed by covenant is thus expressed in Gibbin's work: "The obligation imposed by the covenant to repair differs from the common law obligation against permissive waste in this: The common law obligation is merely to guard the fabric of the building from decay and is not infringed by an external dilapidation unless the fabric is injured in consequence. By the covenant, the tenant is unconditionally bound to repair all dilapidations, whether the fabric of the building is injured or not; injuries to the building caused by inevitable accident are excepted from the common law obligation, but not from the obligation of a general covenant."

In the practice of valuing dilapidations under a repairing covenant the architect has to interpret the words of the covenant and then survey the property and prepare the schedule and claim, and it will be convenient to consider the subject under these two branches.

Repairing Covenants.

For the proper interpretation of the repairing covenants the architects must have some acquaintance with the law upon the subject as laid down in some of the leading decided cases, for it is obvious that without such knowledge it would be impossible to properly advise upon the complicated and difficult cases that occur in practice. It may be urged that it is the duty of the lawyer to define the exact meaning of the words in the lease, and though, doubtless, this is true, yet in practically every case it is found that the lawyer cannot interpret the words of the repairing covenant without the assistance of the architect, unless he is possessed of more technical knowledge than one can reasonably expect a lawyer to possess.

Speaking broadly, the repairing covenant in the lease generally consists of two divisions—(*a*) an undertaking in general terms, (*b*) an undertaking to do certain acts of reparation, such as painting and papering, at specific periods.

With regard to the general undertaking it varies very much. In the more common forms it consists of an undertaking either to "keep and leave the premises in good tenantable repair," or to "keep and leave the premises in substantial repair." There are, of course, innumerable other forms with ill-defined shades of difference, and, of course, reservations may be inserted to protect the lessee, such as "regard being had to the present condition" and "fair wear and tear excepted"; but with these special conditions it is not proposed to deal further than to say that in the former case a most careful note of the state and condition of the premises at the commencement of the tenancy should be made and agreed upon by both lessor and lessee; and with regard to the words "fair wear and tear excepted," if these words are allowed it renders comparatively slight the liability of a tenant who has been careful to use the premises as a careful tenant should.

Necessity for Preliminary Surveys.

In considering repairing covenants for a proposed lease, the first point to be mentioned is the desirability—in fact, the necessity if the tenant is to be properly protected—of making a survey of the premises; for, as previously pointed out, the presumption is that at the commencement of his term the tenant was satisfied that every part was sufficiently strong to last to its close. But how often is it that an architect is instructed to survey before the lease is signed? It is probable that not in one lease in a hundred is an architect retained on behalf of a lessee. It is not until the latter has had a notice served, calling upon him to make good certain dilapidations, or claiming damages in lieu thereof, that he consults his architect. It should be pointed out to a tenant that a preliminary survey is absolutely necessary, when it is remembered that where the lessee covenants to "*keep* and leave the premises in repair" he is bound to *put* them in repair, if at the commencement of the term they require it. *Payne* v. *Hayne* (16 M. & W. 541) decided this point. This view cannot be generally known by tenants, for one is constantly met with the remark by the lessee, after he has been served with a notice, that "the premises are in a better state than when the lease was entered into." It should also be remembered that the measure of damages for want of repairs during the existence of the lease is not necessarily the amount which it will cost to execute the work; for not only is the tenant bound to carry out the repairs necessary, but he is liable in damages if it can be proved that the value of the reversion is lessened. There is a good deal of misconception as to this, but there is no doubt that the architect is justified in preparing the schedule and claim on behalf of the landlord to include, in addition to the repairs, the damage that he estimates the reversion has suffered in consequence of failure to carry out repairs at the right moment. The law holds that the legal measure of damage is not necessarily the amount that would be required to put the premises into repair, but the amount to which the reversion is depreciated in marketable value; an amount which, under different

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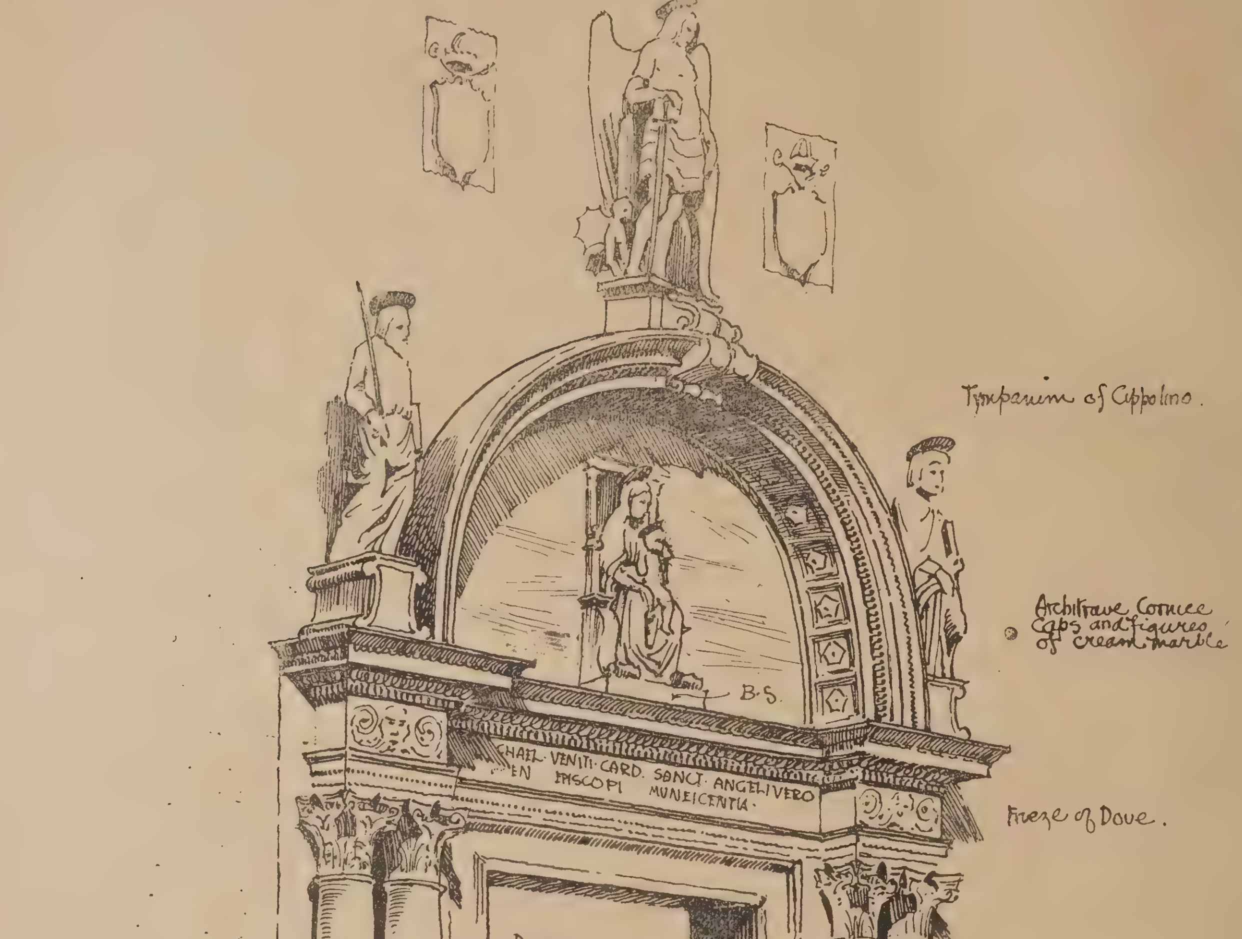

DOORWAY TO GARDEN OF CARDINAL'S PALACE, VERONA. Drawn by PERCY E. NOBBS.

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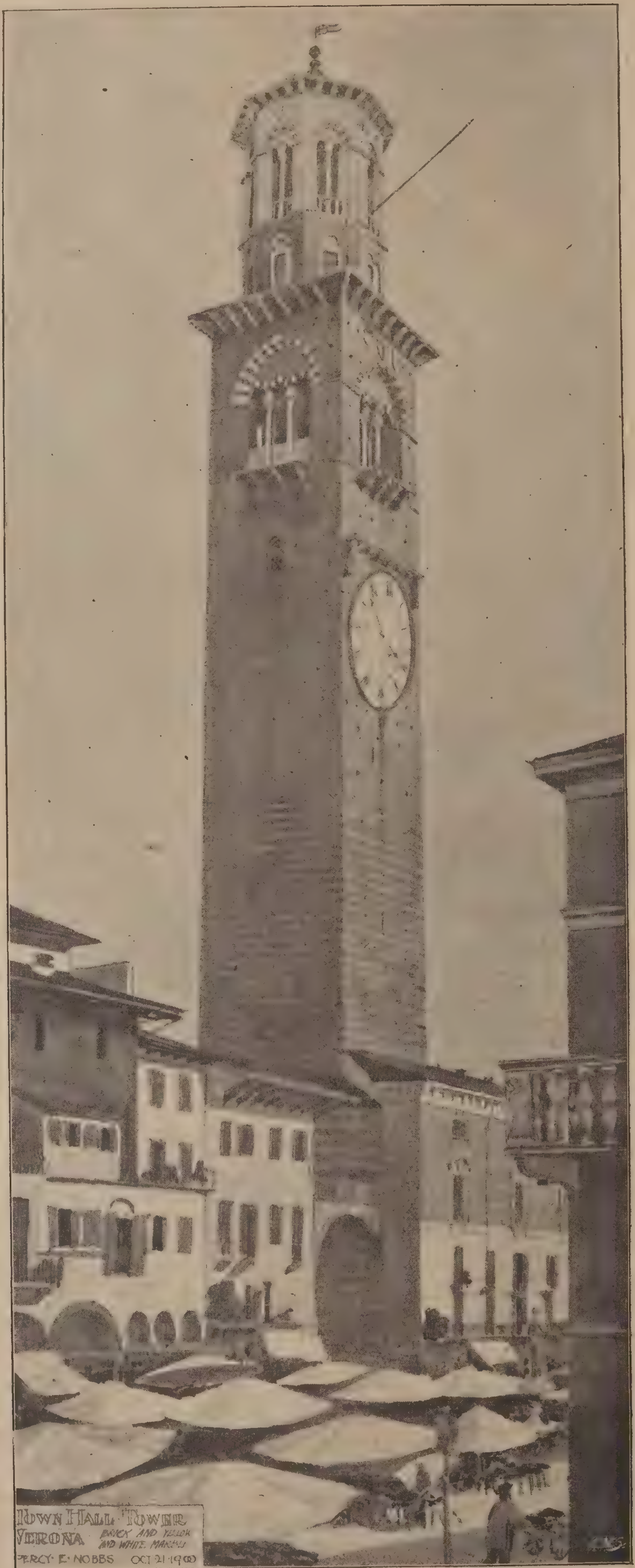
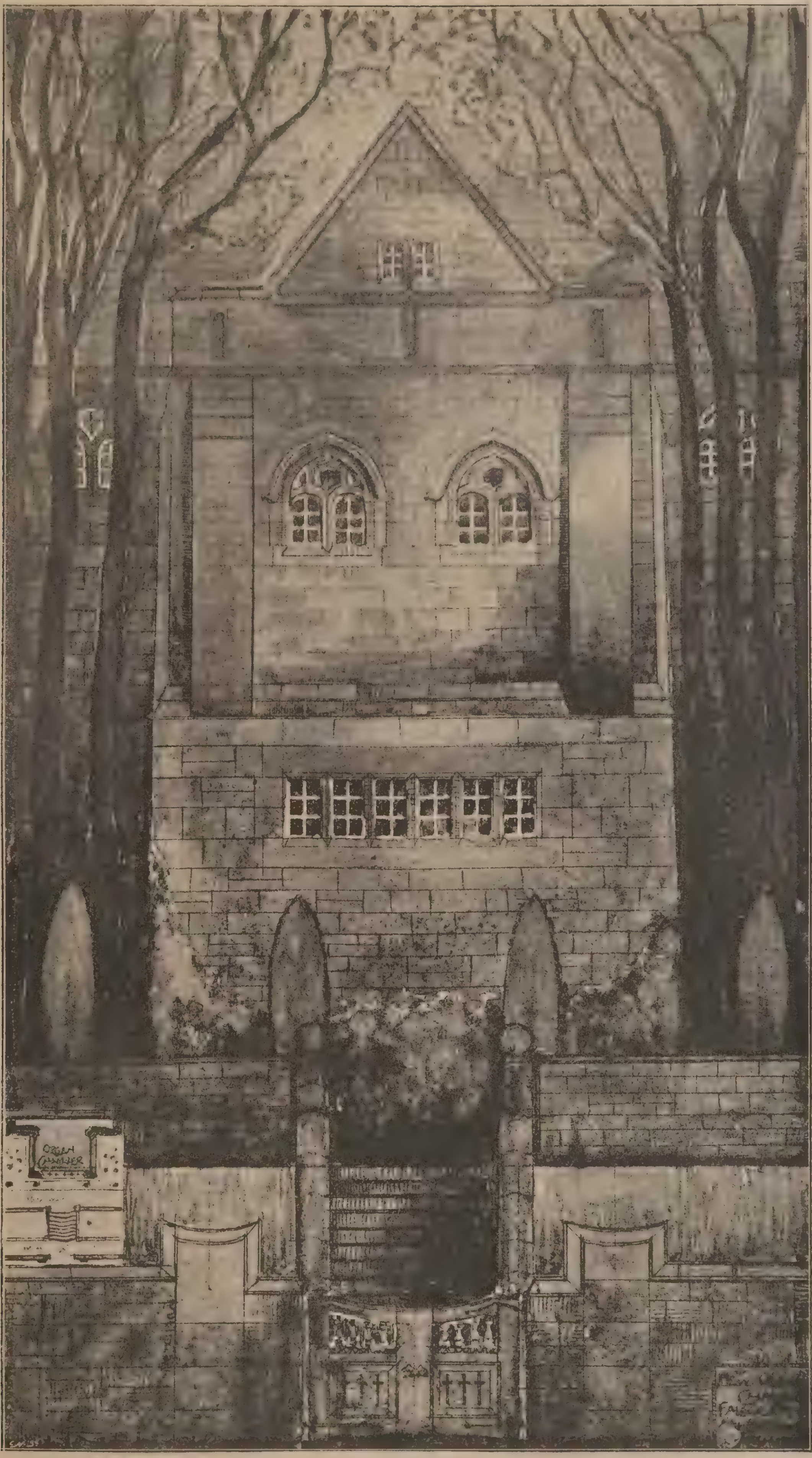


Supplement to
The Builders' Journal and Architectural Record,
Wednesday, March 27th, 1901



NEW ORGAN CHAMBER, FALSGRAVE, SCARBOROUGH. Hall, Cooper and Davis, Architects.

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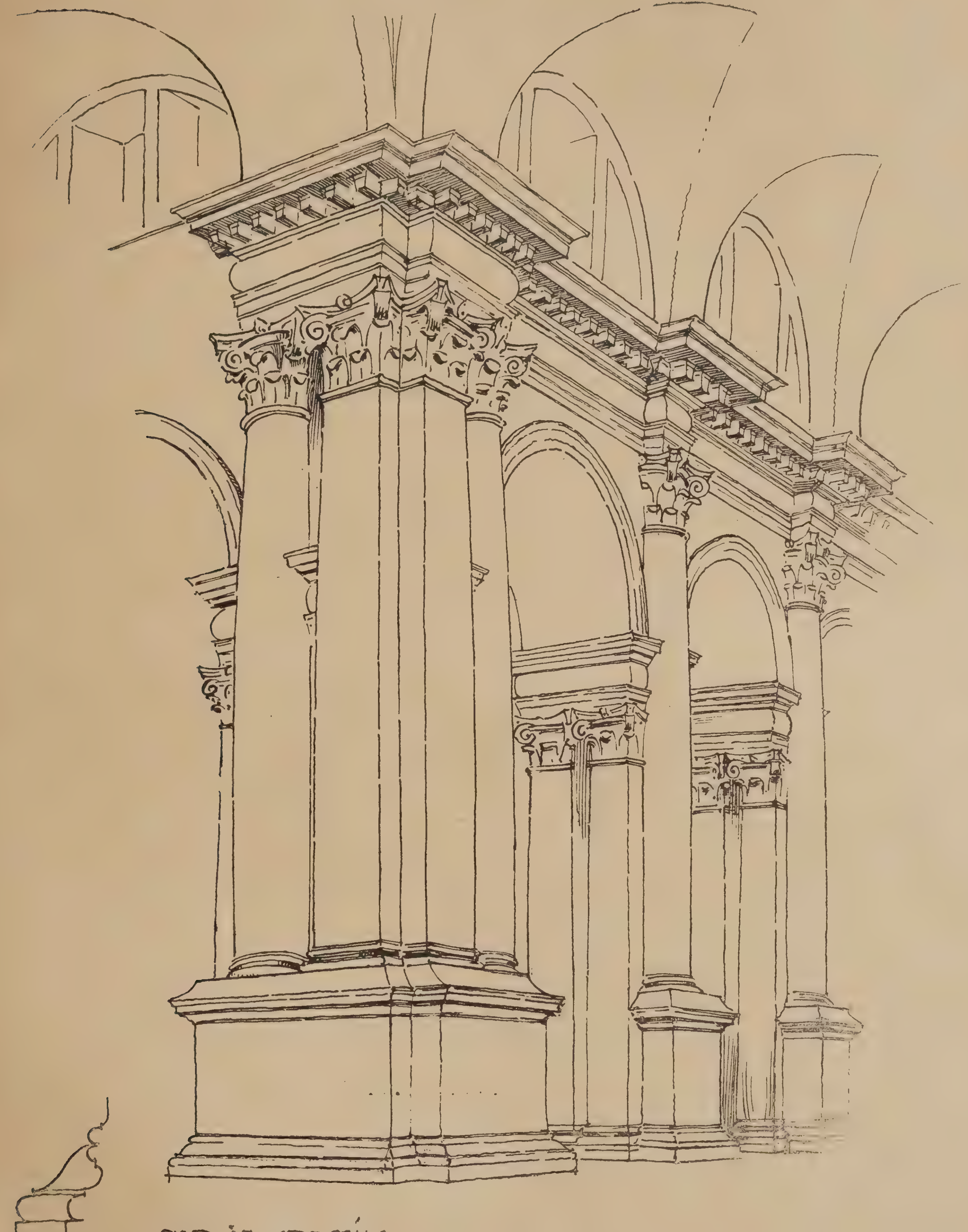

S. GIORGIO MAGGIORE, VENICE. Drawn by PERCY E. NOBBS.

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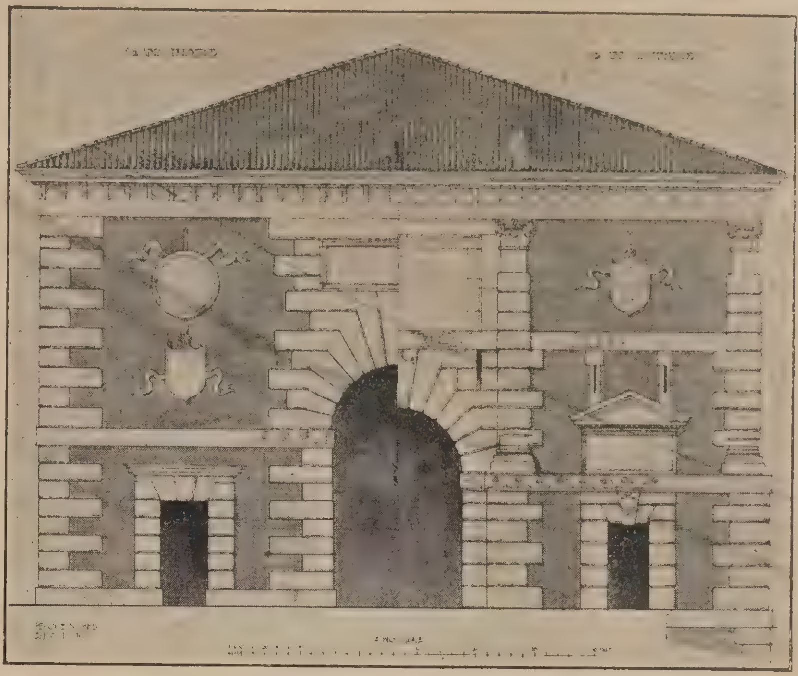
conditions, varies immensely, from merely nominal damages in the case of a lease having many years to run, and increasing more and more the shorter the residue of the term happens to be. To give an instance: Suppose, when making the survey, it is found that a lead gutter has been leaking, maybe for some considerable time; it might and probably would not be a proper measure of the damage to take simply for soldering up the crack, or the renewal of the gutter, since the leakage that has been going on for some time has damaged the gutter-board, bearers and plate, not sufficient to cause actual decay noticeable at the moment of the survey, but enough to have started the woodwork rotting. In addition therefore to making good the lead gutter, the lessor is entitled to be paid something for the depreciation in value of the structure, admittedly a very difficult matter to ascertain, but which the lessor, when the amount is ascertained, is clearly entitled to. The rule for this is laid down in the case of *Williams* v. *Williams* (L. R. 9, C. P. 659).

What is "Good" Tenantable Repair?

As to the covenant to repair, take the case first suggested, namely, where the lessee undertakes "to keep and leave the premises in good tenantable repair." The architect is asked to prepare a schedule of dilapidations to be served upon the tenant for him to carry out, or a claim for a money payment in lieu thereof, and the question arises, what is "good tenantable repair." Previous to 1890, there was considerable difference of opinion as to what was meant by the words, but in that year the case of *Proudfoot* v. *Hart* was tried and a determined effort was made by the judges in the Court of Appeal to deal with the question, and they proceeded to give a definition of the words and to illustrate the application of the principle they laid down. Doubtless the definition given would be considered by the architect better than the practical application of it, but the case is so important that it well repays a careful study. It was a case originally tried before an official referee, who held that the tenant's obligation was to repaper with similar paper to what was on the walls before, and to repaint with similar paint to that which was on the painted portion of the premises. On appeal to a Divisional Court it was held that the official referee was wrong. Mr. Justice Cave stated that tenantable repair extended to commissive waste undoubtedly, and he also thought to permissive waste, and that the tenant must make good the damage exceeding ordinary wear done by his family and servants, but that he must also make good the damage done by other causes—such, for instance, as a casual storm that takes off a slate from the roof or a stone thrown from outside which breaks a window; and if the tenant neglects to do these things, with the result that still further damage is caused to the structure, then he must make good that further damage also, because it comes of his not performing his covenant to do tenantable repairs. With regard to paper and paint, Mr. Justice Cave thought that the tenant could not be bound to repaper or repaint simply because the former paper was worn out and the paint worn off, so long as no damage is done to the walls and woodwork by omitting to paper and paint; also, with regard to whitewashing, if the ceilings as a natural result of tenancy became black the tenant was not liable to whitewash them. So with regard to the walls, the floor, the doors, the windows and all the different parts of the house, he thought the tenant was bound where there was a breakage, whether arising from his own family or from some external accident, to repair it to the best of his ability, but was never bound when a portion of the structure had become absolutely worn out, rendering it necessary to substitute a new structure in place of it. All he thought that the tenant undertook to do was to patch the thing up so long as it was right and reasonable that the thing should be patched up, but when it had reached such a state that patching up was of no avail, then the tenant was not bound to put in anything new or to pay any proportion of the cost of putting in the new thing because the old one had become unfit to discharge its duty.



PORTA SAN ZENO, VERONA, BY SANMICHELE. DRAWN BY PERCY E. NOBBS.

Had this view been successful it would have rendered a tenant's liability under a covenant for tenantable repair even less, or at any rate of not greater value, than it is now with the addition of the words "fair wear and tear excepted;" but when the case came before the Court of Appeal, the judges, without holding that the judgment of either the official referee or the Provisional Court was wrong, adopted the alternative of themselves saying that they did not agree with either, and then proceeded to lay down the principles upon which the case should be decided. The Master of the Rolls (Lord Esher), adopted the definition of Lord Justice Lopes as to good tenantable repair which, he said, meant "such repair as, having regard to the age, character and locality of the house, would make it reasonably fit for the occupation of a reasonably-minded tenant of the class who would be likely to take it;" and he proceeded to point out that while the question whether the house was or was not in tenantable repair when the tenancy began was immaterial; yet the age of the house is very material with respect to the obligation both to keep and leave the premises in tenantable repair, it being obvious that the obligation is very difficult when the house is fifty years older than when the tenancy began. The age of the house must therefore be taken into account, because nobody could reasonably expect that a house 200 years old should be in the same condition of repair as a house lately built. The character of the house must be taken into account because the same sort of repairs that would be necessary to a palace would be wholly unnecessary to a cottage, and the locality of the house must also be taken into account, because the state of repair necessary to a house in Grosvenor Square would be wholly different from the state of repair necessary for a house in Spitalfields. There is no liability on the part of the lessee to put the house in the same state of repair that it was in when he took it. It need not be put into perfect repair, nor is there any liability to paint and paper, but if the paint and paper is in such a condition that no reasonably-minded person of the class likely to take it would live in it, then the lessee is bound to paint and paper. Again, it does not follow that the painting and papering must be of the same class as at the commencement of the lease. There might be such expensive papers and such decorative paint-work as would be inconsistent with the requirements of the class of persons likely to take the house, and because special painting and papering existed at the commencement of the lease this would not render it incumbent upon the lessee to paint and paper in the same manner. It must not be forgotten that if the premises are out of repair when the lease is entered into, the tenant is bound to put them into good tenantable repair. It is also clear that the tenant must commit no waste.

The definition adopted in this case is an expansion of the definition given in earlier cases, or rather a collocation of all the different parts of the definition to be collected from those cases.

Papering and Painting.

The application in actual practice of the principles laid down by the Master of the Rolls is not so easy as might appear at first sight. It is much easier to speak generally of such repairs as a reasonably-minded tenant of the class likely to take the house in question would be satisfied with, than to say in precise terms what these repairs really are. The Judge allowed himself a very wide latitude in the illustration he gave, for he said: "If when the tenancy ends the paper on the walls is merely in a worse condition than it was when the tenant went in, the mere fact of it being in a worse condition does not impose any obligation on the tenant to repaper. If it is in such a condition that a reasonably-minded tenant of the class likely to take houses in Grosvenor Square (the hypothetical case with which the Judge was dealing) would not think the house unfit for occupation, but suppose the damp had caused the paper to peel off the walls and it was lying upon the floor so that the tenant would think it a disgrace, I should say then that the tenant is bound to put up new paper. The same view applies as to painting. If the painting is in such a state that the woodwork will decay unless it is repainted, it is obvious that the tenant must repaint, but I think that the obligation goes further than that. A house in Spitalfields is never painted in the same way as one in Grosvenor Square; if the tenant leaves the house in Grosvenor Square only good enough for a house in Spitalfields, he has not discharged his obligation; he must paint it in such a way as would satisfy a reasonable tenant taking a house in Grosvenor Square."

There is room for much difference of opinion between the extreme instances suggested in the judgment; there can, of course, be no doubt that when the paper is peeled off the walls and lying upon the floor it would be necessary to repaper, but there is the case constantly arising in practice when the paper has been upon the walls say three or four years and is faded in places and perhaps tarnished in other places. Most new tenants, at any rate for houses of £50 or £60 per annum, would require new paper, also painting long before it has become so bad that the woodwork was decaying; therefore, in deciding upon such repairs as a reasonable tenant would require, there is plenty of scope for the judgment and experience of the architect, and it is more than probable that the judges themselves would have to narrow down considerably for future guidance the application of the principle illustrated in this case.

The Covenant to "Well and Substantially Repair."

To pass to the obligation under the second kind of repairing covenant, namely, that under which a tenant is bound to "well and substantially repair." Great difficulty often arises in the cases of old buildings under a lease granted many years ago containing a general covenant to repair in some such terms as the following: that the lessee shall "well, sufficiently and substantially repair uphold," &c. At the expiration of the lease the tenant may be called upon to carry out such sweeping works as amount practically to rebuilding. Generally the matter is settled by a money payment, but before this can be arrived at it is necessary to say what repairs the tenant is legally liable for under the covenants of the lease, and in arriving at a decision it is very important to consider carefully the age and general condition of the building as it would have been at the commencement of the term, because where an old building is demised and the lessee enters into a covenant for substantial repair it is not meant that the old building is to be restored in a renewed form at the end of the term, nor that it is to be of greater value than it was at the commencement of the term. What the natural operation of time and the elements occasion in diminishing the value constitutes a loss which, so far as it results from time and nature, falls upon the landlord. This was laid down very clearly by C. J. Tindall in *Gutteridge* v. *Maynard* (1 Moad and Rab at p. 336) and this view was adopted in the Court of Appeal in the case of *Lister* v. *Lane* (1893, 2, Q B, 217).

The Case of "Lister v. Lane."

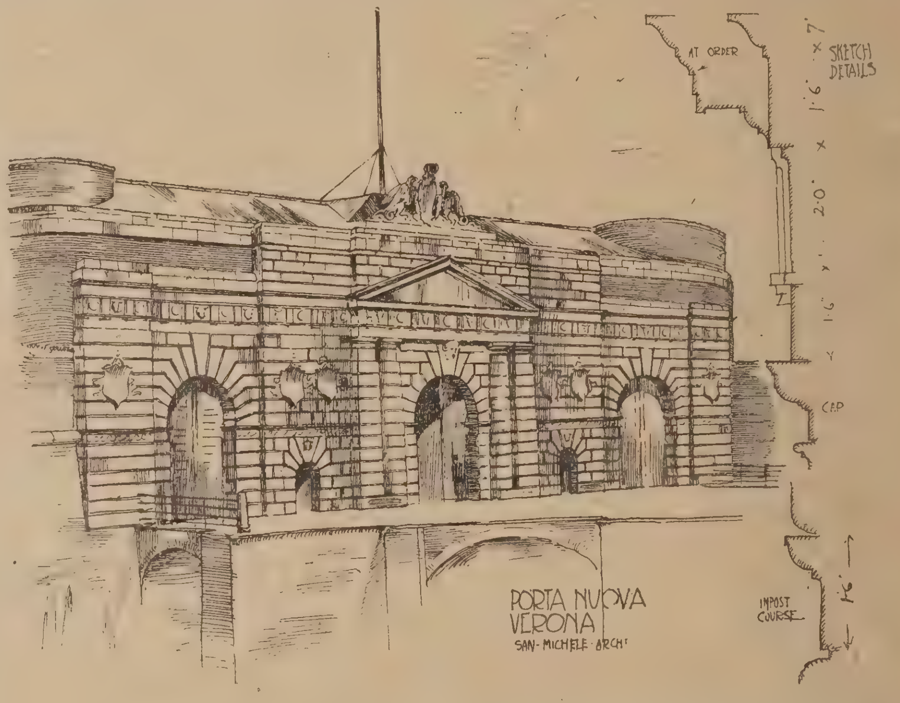
The latter case is so important that a short summary of it may be found useful. It was a lease of a house in Lambeth containing a covenant that the lessees would, when and where and as often as occasion should require, well, sufficiently and substantially repair, uphold, sustain, maintain, amend and keep the demised premises; and the same so well and substantially repaired, upheld, sustained, maintained, amended and kept, and at the end of the term yield up to the lessors. Before the end of the term one of the walls was bulging out, and after the lease had expired the house was condemned as a dangerous structure and was pulled down. The lessors sought to recover from the lessees the cost of rebuilding the house. The house was at least 100 years old, and probably much older; it was built upon a timber platform resting on a boggy or muddy soil, and the bulging of the wall was caused by the rotting of the timber. The solid gravel was 17ft. below the surface of the ground. There was evidence that the wall might have been repaired during the term by means of underpinning. It was held that the defect, having been caused by the natural operation of time and the elements upon a house, the original construction of which was faulty, the lessees were not under their covenant liable to make it good

With regard to the question of underpinning, which it was contended might have been done to prevent the wall bulging, it is to be borne in mind that this would not have been "repairing" the thing that was put in originally, namely, the timber platform, but it would have been something of quite a different character, and this being so there was no liability upon the tenants to carry out underpinning; it was out of the question to repair the timber platform without pulling down the house, and, however large the words of the covenant to repair may be, a covenant to repair is not a covenant to give a different thing to that which the tenant took when he entered into the covenant: he has to repair that which he took, not to make a new and different thing, and, moreover, the nature and condition of the house itself, the result of time upon that state of thing, is not a breach of the covenant to repair.

The Lord Chief Justice in this case said: "You have to look at the condition of the house at the time of the demise, and amongst other things the nature of the house, what kind of a house it is: if it is a timber house the lessee is not bound to repair it by making a brick or a stone house; if it is a house built upon wooden piles in soft ground the lessee is not bound to take them out and put in concrete piles."

Fixtures and Fittings.

It will of course be remembered that all fixtures and fittings belonging to the freehold are subject to the same conditions as regards repairs as the house or building itself, but in practice cases occur where the ownership of the fixtures is disputed. The rule with regard to fixtures used to be much more stringent than it is now. At one time everything affixed to the premises was held to go with the freehold, but this rule has been considerably relaxed by recent decisions. There is a very recent case bearing upon the question of fixtures, which was decided by the Court of Appeal only a month or so ago. It is the case of *Ward* v. *Taylor* in re *De Falbe* (see page 19 of the Builders' Journal for February 13th last), in which Mr. J. Byrne held that some pieces of tapestry which had been affixed by the tenant for life of freehold estates to the walls of the drawing-room of the mansion house passed on her death as fixtures, with the estates, to the persons entitled in remainder. Upon the evidence Mr. Justice Byrne found that the tapestries were fixed on the walls in the following manner: Small strips of wood were fixed on the walls (which in some parts were faced with wood) by means of nails and screws, and over these wooden strips canvas was stretched and nailed; the tapestries were fastened to these strips and over this canvas was fixed by very small tacks, which did not penetrate the wooden strips. After the tapestries were put up white and gold mouldings, made for the purpose, were fixed round the strips of wood by thin wire nails and screws, some of which were long enough to penetrate the face of the wall. The judge held that the tapestries formed an essential feature of the general decoration of the room, and although the ceiling and frieze remained as before, the rest of the walls of the room were altered and redecorated to accord with the tapestries. The judge also held, on the authority of *D'Eyncourt* v. *Gregory* (1866. L.R, 3 Eq 382) and *Norton* v. *Dashwood* (1896 2 Ch. 497), that, having regard to their position, importance and the essential part they played in the decoration of the room, the tapestries had been in effect annexed to the mansion house and passed with it to the remaindermen.



The residuary legatee under the will of the tenant for life appealed.

Lord Justice Rigby, in giving judgment, said that the representative of the tenant for life stood in the same position as the tenant for life herself with regard to the remaindermen. At one time anything whatever affixed to the freehold was held to go with the freehold, and it was only by slow degrees that that unbending rule had been modified. But in later times important exceptions from the rule had been established. One exception entitled a person who had put up fixtures for trade purposes to remove them. That exception was not confined to the case of landlord and tenant, but extended to the case of a tenant for life and remaindermen. Another very important and well-established exception existed in the case of articles affixed to the freehold, not for the purpose of enhancing its value, but for purposes of ornamentation. Such articles were removable by the person who had fixed them. This exception applied as between tenant for life and remaindermen, and it was of general application. The question here was whether these tapestries were affixed to the freehold so as to become part of the house or so as to be removable at the will and pleasure of the person who had affixed them during her lifetime, and by her executor after her death. They were no doubt as firmly fixed as though the person who had put them up had intended them to remain there always, but that was not of much importance. In all cases where the article was affixed to the freehold simply for purposes of ornamentation, the exception applied.

Liabilities of Lessors and Lessees.

Having now considered the responsibilities of landlord and tenant under the common law, and under the common forms of repairing covenant, it may be well before proceeding to the consideration of the actual survey, to summarise the liabilities of lessors and lessees.

Briefly then, the lessor is not liable to repair or even to rebuild in case of fire, even if he has received the insurance money. There is no implied covenant that the house is fit for occupation, or that it will last during the term. Neither is the landlord liable to the tenant's customers or guests for accidents happening when he lets a house in a dangerous state, there being no law against letting tumble-down houses; and in the case of *Manchester Bonded Warehouse Company* v. *Carr* (1880, 5 C.P.D., 507), where a building had fallen in consequence of a floor being overloaded with flour, and rent was claimed by the lessors during the time the building was unoccupied, the court said distinctly that they were not prepared to extend to ordinary leases of lands, houses or warehouses any implied covenant or warranty as in the cases of *Smith* v. *Marrable* and *Wilson* v. *Finch Hatton*, as they would be bound to do if they were to hold the plaintiffs liable for the fall of the warehouse by reason of any implied covenant or warranty. Lessees must use premises in a tenantlike manner, must commit no waste, must pay rent though premises be burnt down, must keep premises wind and water tight. A tenant for years is liable for permissive waste.

Under a covenant to keep premises in good and tenantable repair, the nature of which undertaking has been previously defined, the responsibility of the lessee is slight as regards actual structural repairs, but would appear to be considerable with regard to painting, papering, whitewashing, and such decorative work; a responsibility which, previous to decision of *Proudfoot* v. *Hart*, was looked upon as practically nil.

The lessee's responsibility under a repairing covenant to keep in substantial repair, &c., is much greater than that under a covenant for good tenantable repair; his liability extends to making good all dilapidations to the structure and decorations, except such as are caused by the natural operation of time and the elements in diminishing the value, the practical effect of which is set out in the case quoted of *Lister* v. *Lane*. Thus, if the premises are old at the time of the demise, he is bound only to execute such repairs as may be necessary to keep up the premises as old premises. It may be again mentioned that the courts now seem to construe the covenant on the part of the lessee to keep the premises in substantial repair in a less stringent way than formerly and pay more regard to the age and character of the premises than was hitherto the case. It may also be stated here that if the landlord neglects to do repairs which he is bound under a covenant to do, the tenant is not justified in leaving the premises, neither may he execute them and deduct the cost from the rent.

Surveys.

Having considered the obligations of landlord and tenant arising under the common law and under covenant, we proceed to the actual survey and preparation of the schedule and claim.

Before surveying, the nature of the tenancy will doubtless have been carefully considered, and in many cases the legal position will have been discussed with the lawyer.

In making his survey the architect should bear in mind that there is a wide practical distinction between an interim schedule and a schedule prepared at the expiration of the tenancy. Is is generally sufficient in the former case to prepare it, having particular regard only to such dilapidations the non-repair of which will cause injury to the structure to the reversion; such matters as decoration and details which concern the personal comfort of the tenant may very well be omitted. If the schedule is being prepared at the expiration of a tenancy, all matters for which the tenant is liable under the repairing covenant are of course included.

In the practice of preparing a schedule and claim the method varies very much, those prepared by architects generally going more into the detail necessary for the carrying out of the work of reinstatement than those prepared by surveyors; in fact, an architect's schedule purports to be in some cases a complete specification. There is no necessity for this: it may rather prove a disadvantage, for very often it happens that all that is necessary to be done to make good some of the defects cannot be foreseen till the work is actually being executed, and it may be that what is described is inadequate, or not the best way to do what is requisite. On the other hand it may specify a method of carrying out the repairs which is more elaborate and costly than the lessee can reasonably be expected to bear. It may therefore be taken as a good general rule that while the defects cannot be noted in too great detail, the specifying of the method of remedying them is not only unnecessary but unadvisable

Most architects follow their own system, but there is much in common in all the methods, and although the practice with regard to points of detail varies greatly, the following method of procedure will be found convenient: Before commencing to note the dilapidations take a general survey so as to get to understand the arrangement or plan of the premises; one can also see generally whether the tenant has been careful or otherwise in his use of them and preserved them by executing reasonable repairs at the proper time.

Examining the Roofs.

Having made this preliminary survey, commence with the exterior, the roof for preference, and keep the various parts of the building under separate heads, clearly defined so as to be easy to trace subsequently.

Examine the roof covering noting such defects as missing or slipped tiles and slates; examine the slate nails—they may be in a worthless state owing to rust. If the roof is generally uneven or baggy it indicates that the laths are decayed and a further examination may prove possibly that the rafters are decayed —maybe so much as to render it necessary for the roof to be stripped, firred up and relathed, retiled or reslated. Note any defective flashings and fillets against abutments, also any open joints indicating a want of pointing to the verges, ridges, hips or tiling generally.

While upon the roof any defects to the lead or zinc gutters or flats can be seen. It often happens in old houses that the fall of some portions of the gutters is defective; this may indicate a sagging of the bearers generally, attributable to decay, or it may be as the result of leaks; it will be necessary to take up and make good the woodwork and rèlay or renew the lead or zinc.

Next take the chimney shafts, parapet walls, &c., that can be seen from the roof. These must be carefully examined, particularly the chimney heads and pots, which are often out of the upright with many loose bricks and loose or missing pots. Also with regard to the open joints in the shafts which require pointing up, or the shaft itself may be so much out of the upright as to require rebuilding.

Parapet walls and copings should be examined for the same defects, namely, want of pointing, defective cramps or decayed bricks, some parts badly out of the upright, or some of the brickwork quite loose and requiring resetting. In many cases parapet walls are rendered; any defect in the condition of this should of course be noted.

While upon the roof look carefully over skylights, trapdoors, &c; these matters have generally been neglected, being more or less out of sight. Also any defects in the iron gutters should be taken while upon the roofs. They are often full of dirt, and the insides may not have been painted for many years, being consequently rusted almost through; also the cistern heads may be choked up. Lastly, before leaving the roof, take note of any painting.

Elevations and Exterior Generally.

Next proceed with the elevations. It is a good plan to have a system in dealing with them, say commencing with the front elevation and working round from east to west. Examine the condition of the brickwork for want of pointing generally, or round door or window frames, soft bricks, if the walls and gables are bulging or cracked, if bulging or cracked bearing in mind what has been said as to inherent defects; look to the arches for cracks and loose and dropping bricks, also the condition of the sills, string-courses and other ornamental features. If there is any rough-cast or cement work it should be carefully examined to see that it has not left the laths or walls. The stone steps, landings, &c, should be looked to and any defects noted, the condition of the woodwork examined, wood sills to windows being very liable to decay, and the condition of the rainwater piping, shutters, glazing and the painting inspected generally.

Having completed the elevations, look over the pavings, fences, also drains, &c. It is well to give the approximate quantity of paving that requires relaying, also details of the fencing. With regard to drains and sanitary fittings, it often happens that the drains if tested would be found to leak badly, also the soil and vent pipes at the joints. It would not be reasonable in the case of old houses to expect the drains to stand the water test, but it is often found that drains are partly choked up; leaky joints in a soil pipe would certainly generally be covered by the repairing covenant and would be scheduled.

Inspecting the Interior of Houses.

Having completed the exterior, proceed with the interior, taking it floor by floor (commencing at the top) with the passages last; then the staircases and landings to the floor below. It is well to have plan of the rooms in mind and to select a convenient point for commencing, and then to follow naturally through the various apartments, taking care to identify the rooms so that anyone can follow them.

Of course the method of procedure would vary with the size of the house. It is convenient in the case of a very large house to subdivide each floor into wings or the other natural divisions that the arrangement presents. Having settled the general lines of procedure, take room by room, carefully noting all defects to the structure first, then to the flooring, doors, architraves, skirtings, window sashes, frames or finishings, door and window furniture. Examine the fitting of all doors and windows and see if they open easily and properly; inspect the chimney-piece, hearth and grate. It may be necessary to clean the chimney-piece if there is no actual defect; the firebrick may be burnt out in the case of the grate; and the hearth broken, particularly in the case of an old house. In the case of repairs to flooring, distinctly mark the extent of the repairs called for unless they can be so explicitly stated as to be easily followed.

Having taken all defects existing to the structure, fittings, fixtures and finishings, proceed with the distempering and papering, making a note also of any baggy places in the ceilings indicating rotten laths or any defects to the wall plaster. In the case of distempering, papering and painting, it is well to include the necessary preparation previous to the execution of the works by a general clause; it saves much repetition and is a great convenience. Of course, in dealing with decorative work such as distempering, papering and painting, the nature of the work differs very greatly, not only such natural differences as one would expect to find in the different classes of houses, but in the actual decorations of houses of a similar class, and where the lease is silent as to the character of the decorations the architect has to rely solely upon his judgment.

Having dealt with every part of the house, there generally follow some general clauses, as sweeping the flues, blacking grates and ranges, oiling and repairing locks and window fastenings, overhauling water fittings, cleaning out cisterns, sweeping away rubbish and cleaning floors and windows.

It is a great convenience in going over the house again to see that the dilapidations have been properly made good, or in any future negotiations that may take place to have the book in which the dilapidations are entered carefully indexed and the headings of the rooms, &c., carefully and distinctly written; this is particularly so should the case ever come up for settlement in court and the architect has to give evidence.

The order given would be followed in dealing with stabling, outbuildings, &c., so far as they apply, taking each separately.

Preparing Schedules and Estimates.

In preparing a schedule and an estimate of the cost of reinstatement, it is better to take the necessary measurements and particulars for the purpose of the estimate after having noted the dilapidations for the purpose of the schedule. It does not follow by this that another survey is needed, because it may all be done at the one visit. Where two surveyors are appointed to settle a sum in lieu of carrying out the works, it is convenient to try and agree as to the repairs for which the lessee is liable before discussing the question of the damages. It should be remembered that the lessor can claim compensation for loss of rent for such a period as is reasonably necessary to enable the repairs to be carried out.

When advising tenants prior to entering into a lease, in the case of the lessee covenanting to keep and leave the premises in the same repair as at the commencement of the term, it is necessary to prepare a schedule very carefully so as accurately to show in detail the condition of the premises at the time, and the lessor should admit its accuracy before the lessee signs the lease.

There are many other points in connection with the survey and claims that might be touched upon did time permit, but I feel I have trespassed too long already upon your patience. However, if what I have said is found of some little use in focussing the main principles as laid down in some of the leading cases, and as gleaned from actual practice, it is the most I can hope for, and I shall feel that the object which I had in view has been attained.

BUILDING BY-LAWS IN RURAL DISTRICTS.

The R.I.B.A. and the L.G.B.

A DEPUTATION appointed by the council of the Royal Institute of British Architects waited on Mr. Grant Lawson, Parliamentary Secretary to the Local Government Board, on Tuesday, March 12th, to lay before him the views of the Institute on the question of administration of building by-laws in rural districts, which had already been expressed to the Local Government Board in October, 1899, when Mr. T. W. Russell received the representatives of the Institute.

The deputation consisted of the following gentlemen:—Mr. W. M Fawcett (past vice-president), Professor T. Roger Smith, Mr. Lacy W. Ridge, Mr. H. D. Searles Wood, Mr. E. Guy Dawber, and Mr. W. J. Locke, secretary.

The points submitted to Mr. Grant Lawson had been summarised as follows:—(1) That there has been of late a great increase of interference by public bodies and their officials with buildings in country places. (2) That this has arisen from the Local Government Board having permitted, and in fact encouraged, "rural authorities" to take to themselves "urban powers." (3) That such an assumption of powers by a local authority is an unnecessary and vexatious infringement of the liberty of the individual subject. (4) That it is undesirable, except perhaps in public buildings, that local authorities should relieve private persons from their responsibility for the soundness and sufficiency of their building construction. (5) That there is no desire on the part of the Royal Institute of British Architects to limit the application of such by-laws as are strictly sanitary in their object. (6) That there is no objection to by-laws as to the width of streets being generally applicable, as they would remain inoperative while a district remained rural. (7) That a complete and efficient by-law as to party-walls would sufficiently protect each individual from the danger of fire from his neighbour's premises in country places, in uncrowded districts, and wherever streets are laid out with the width and spaces required by the by-laws. (8) That in such places the minute requirements of the by-laws against fire, founded as they are on the legislation originally passed for overcrowded London after the Great Fire, are unnecessary and vexatious. They are frequently rendered grotesque by the erection of large structures in wood under the form of balconies and verandahs. (9) That the local authorities are practically dependent on the Local Government Board for assistance and direction in framing by-laws. (10) That the scheme of the R.I.B.A. is that the Local Government Board should arrange their model by-laws in divisions, and sanction in each district only such as are really needed therein, and so protect the public from vexatious interference in building. (11) That this is a matter to be met wholly by administration within the Board, and does not require legislation.

The following suggestions are made by the Royal Institute: (1) That the system for dealing with party-walls by the appointment of three surveyors as re-enacted in the London Building Act, 1894, has proved successful during a long period. That it is desirable that it should be extended to the growing suburbs around the districts of the London County Council, to such towns as are without special legislation on the subject, and to England and Wales generally. (2) That it would be desirable to establish a tribunal of appeal in connection with the Local Government Board for settling differences which arise as to the meaning of by-laws and building regulations. That to be of value the tribunal must act with speed and have technical knowledge.

Mr. Grant Lawson, replying to arguments in support of the above points, said that both the President of the Local Goverment Board and himself were agreed that evils did exist in the present system of administration of building by-laws, and that there should be a difference in the codification of by-laws for rural and for urban districts. The proposals of the Royal Institute had received careful consideration, and since the appointment of Mr. Walter Long and himself efforts had been made as far as possible to adopt them. Mr. Lawson first desired to point out that it was not the function of the Local Government Board to take the initiative in the question of district by-laws; the Board only approved by-laws submitted to them by local authorities. It was not in the power of the Board to compel a local authority to adopt any particular set of by-laws. As regards encouraging local bodies to take "urban powers," the Board only did so in cases where very insanitary conditions rendered such a course desirable. With regard to meeting the views of the Institute the Board had drawn up a set of proposed model by-laws for rural district councils, on which he invited the opinion of the Institute. These by-laws were scheduled as follows:—

(*a*) Interpretation of terms.

(*b*) Exempted buildings.

(*c*) Structure of walls and foundations of new buildings for purposes of health. With respect to the sufficiency of the space about buildings to secure a free circulation of air, and with respect to the ventilation of buildings.

(*d*) With respect to the drainage of buildings.

(*e*) With respect to water-closets in connection with buildings, and with respect to the keeping of water-closets supplied with sufficient water for flushing.

(*f*) With respect to earth-closets and privies in connection with buildings.

(*g*) With respect to ashpits in connection with buildings.

(*h*) With respect to cesspools in connection with buildings.

(*i*) With respect to the closing of buildings, or parts of buildings, unfit for human habitation and to the prohibition of their use for such habitation.

(*j*) As to the giving of notice; as to the deposit of plans and sections by persons intending to construct buildings; and as to inspection by the council.

(*k*) Penalties.

(*l*) As to the power of the council to remove, alter, or pull down any work begun or done in contravention of the by-laws.

(*m*) Repeal of by-laws.

Mr. Grant Lawson pointed out that these proposed by-laws were mainly sanitary in their application, and that regulations as to materials and structural details were omitted. With regard to the request of the Institute for an extension by legislative means of the party-wall system in London to all districts in England and Wales where no special legislation existed, Mr. Lawson said that he could not promise any action this summer, but he would add the subject to the list of Bills which the Local Government Board hoped to introduce at some period during the continuance of the present Government.

The deputation having thanked Mr. Lawson for the courteous action of the Local Government Board in submitting the draft model by-laws for the consideration of the Institute, and also for the sympathetic manner in which he had received them, then withdrew.

The questions are now before the original committee of 1899, who are preparing a report to the Council.

Correspondence.

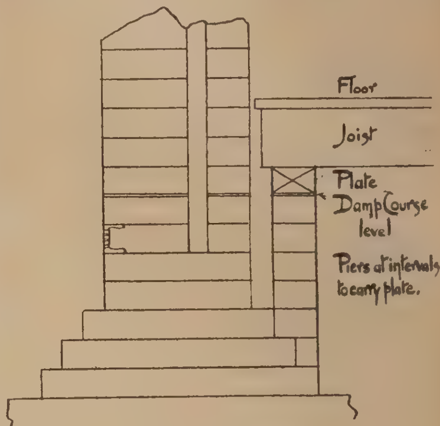
Footings for Hollow Walls.

To the Editor of THE BUILDERS' JOURNAL.

LONDON.

SIR,—I note in your issue for March 13th a reply to a query about hollow walls which seems to me capable of improvement. It is well known that in practice it is very difficult to build hollow walls without a certain amount of mortar dropping down into the cavity, and so accumulating at the bottom, where it would rest upon the damp-course (see sketch on p. 105 of your issue for March 13th, and also on p. 49 of your issue for February 20th last). This would allow the damp to be conveyed to the inner wall *above* the damp-course. For this reason I would suggest that the damp-course should be placed higher in the hollow wall than shown, and divided into two distinct portions. All this is clearly shown in the illustration facing p. 145 of "Specification," No. 4, of 1899, which is a very much better method than that illustrated in the two numbers of your journal above mentioned. I make this comment as I find my students at the Architectural Association accept the answers to queries in your paper as the *best* method of doing work, which I do not take the two methods above illustrated to be.—Yours truly,

MAX CLARKE.



HOLLOW WALLS.

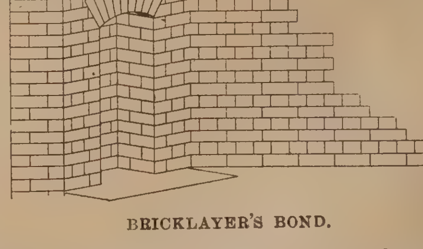
Bricklayer's Bond.

To the Editor of THE BUILDERS' JOURNAL.

WALTON-ON-THAMES.

SIR,—Mr. Carden's reply confirms my opinion that an uncertainty exists as to bond. According to Mr. Carden, any brick that has to be reduced is brought under the head "cutting. I am not an authority on the matter, but think that such is not the case: the term is only applied to bricks that are made to fit a template. The various shapes shown by Mr. Carden round his flues would turn a builder's hair grey. I send a sketch elevation of one angle fireplace taken from Mr. Carden's plan and worked by the method shown by me in your last issue. In reply to Mr. Carden, Figs. 5 and 6 were suggested to me by the courses marked A B on his drawing, and were intended to show the bond in the *angles*. As to cutting the "three-quarter bats," that is a very simple operation compared to the angular pieces.—Yours truly,

ROBERT RAMM



BRICKLAYER'S BOND.

The New Series of the "Builders' Journal."

To the Editor of THE BUILDERS' JOURNAL.

OXFORD.

SIR.—I am sure there is no reader of your valuable journal who can *fairly* grumble at the decision of the proprietors to raise the price.

Ever since I commenced taking it in I have wondered how it could be "done for the money." I have found it an excellent source of information, and I cannot remember a week but what something of fresh interest and information has appeared in its pages.

It is no matter for wonder that the "Enquiry" column has assumed such proportions when the answers always seem so clear and concise.

Wishing you continued success and ever-increasing circulation.—Yours faithfully.

G. G.

[It is very gratifying to us to learn from the numerous letters which we have received, of which the above is a specimen, that our readers so greatly appreciate our journal.—ED. B. J.]

Paving for Brewery Floors,

To the Editor of THE BUILDERS' JOURNAL.

SIR,—On page 122 of your last issue either Victoria stone slabs or Adamant pavement slabs are recommended as the most suitable paving for brewery floors; but as the result of a long experience I should recommend the work to be laid *in situ*. Slabs, however well laid, are sure to crack when subject to the fall of casks. I should advise the use of Potter and Co.'s (109 Victoria Street, S W.) concrete, or Eureka concrete, as manufactured by W. Millar, 1 and 3 Arches, Battersea Park Station, London. Both of these concretes are acid-proof.—Yours truly,

BREWERY CLERK OF WORKS.

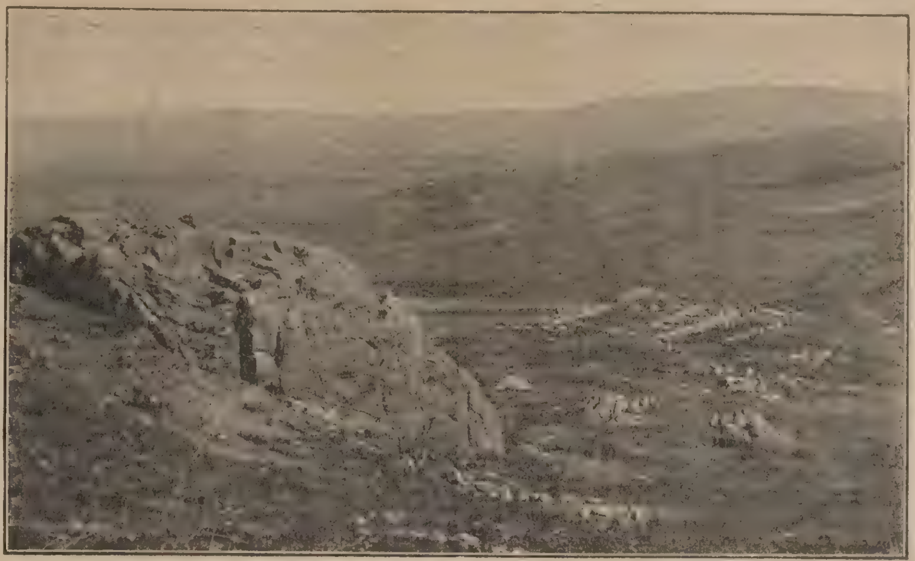
Builders' Notes.

The Will of Mr. H. H. Eadon, builder, Heavygate Road, Walkley, who died on September 21st, amounts to £2,030 14s. 3d.

London County Council.—At last week's meeting of the Council the tender of Messrs. Mattin, Wells and Co., amounting to £8,129, was accepted for the erection of a new fire station at Homerton.

The North Staffordshire Builders' Association, in its annual report, states that 95 per cent. of the builders in the district are members, all of whom have insured their workmen at special low rates against accident. The increasing balance at the bank would be used to form a nucleus for a Builders' Provident Institution or Builders' Exchange, where the members of all branches of the building trade could meet for trade or club purposes. At the beginning of last year the bricklayers gave notice for an advance of ¾d. per hour. The masters offered ¼d., and there was a strike, and an arrangement was come to. This year the stonemasons had given notice for an advance of ¾d., and the association had offered them ½d per hour. The labourers had also given notice for an advance, but as it was not sent as per rule or custom the employers had decided not to entertain it.

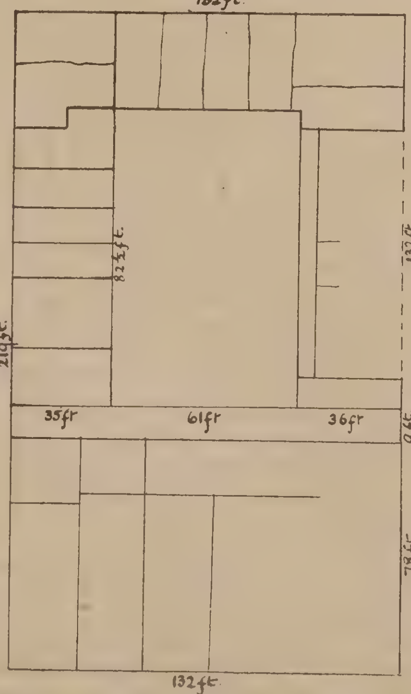
Fire-resisting Glass.—At the glass-works of Messrs. Pilkington Brothers, Grove Street, St. Helens, an interesting series of experiments were carried out recently to demonstrate the efficacy of a new fire-resisting glass which the firm has invented. The glass is a rolled plate with a wire mesh inserted during the making, and it is claimed that in any ordinary fire it will remain connected, and thus minimise the risk of the fire being communicated to other departments. A building was erected with glass sides, and filled with combustible material which was set aflame, but though the glass cracked there was no breakage to any extent Water was then poured upon the building, and though the glass cracked into minute fragments, the wire mesh held it together so that if the panels had been in an ordinary building there would have been little risk of the fire extending.



VIEW OF THE PALACE AND "THEATRE" OF THE HITTITES, BOGHAZ KEOY.

THE HITTITE CITIES OF EYUK AND BOGHAZ KEOY.

AS we announced on page 111 of our last issue, at the moment of going to press we received from the Rev. G. E. White, of Marsovan, Turkey, a photograph and some particulars of the palace and "theatre" of the Hittites at Boghaz Keoy, and would publish them in the next issue. This we now do. The theatre appears in the foreground of the photograph, a huge rock, on one side of the top of which an auditorium has been hewed out, somewhat after the manner of a primitive Greek theatre. It would hold about 100 persons. The focus, where holes drilled in the rock may have supported some players' platform or judges' bench, is at the corner nearest the observer. Below the theatre on the open plain, but within the old city wall, appears the palace This is a mighty ruin, half buried in the platform of earth on which it stood, and which was from 10ft. to 20ft. above the ground. The building consisted of two parts separated by an alley 9ft. wide. The smaller was perhaps the harem or quarters devoted to the ladies of the royal household. The larger part is a square 132ft. each way, and consists of a large central court, after the fashion so favoured by Orientals, surrounded by a series of rooms on every side but one, that being reserved for the approach. The court is 61ft. by 82ft. 6in. The ruins now contain little but the long lines of massive stones, showing where the division walls were placed. The stones go down deep into the ground, but how deep could only be learned by digging; it is many feet, as appears from small diggings that have been made, none of which go to the bottom of the foundation stones. Not far away is the overturned throne, a seat cut between two lions in a stone from 4ft. to 6ft. in each of its dimensions. Some of the stones now seen in the palace measure in size 4 57 × 2 × 1·50 meters; 4 90 × 2 × 1 50; 4 80 × 2·62 × 1 47; and 3 64 × 2 50 × 1 80. On the side nearly looking south there are no rooms, but this was the approach to the building. The ruins of the grand stairway may still be seen, terminating in the central court or reception room. The interest of an amateur is greatly roused by the sight of such a building, worthy perhaps of classification with some of the famous structures in the valley of the Euphrates or the Nile. "I wish," says Mr. White, "it might be examined by a professional architect in a scientific way."



PALACE OF THE HITTITES, BOGHAZ KEOY.

Law Cases.

Blue Lias Lime: An Unsuccessful Claim.—At Westminster last Wednesday judgment was given by Mr. Horace Smith in the case of the Cam Portland Cement Company, of Meldreth, Royston, Cambridgeshire, summoned by the Blue Lias Lime Burners' Association, of Westminster, for the alleged offence under the Merchandise Marks Act of unlawfully applying with fraudulent intent a false trade description to certain lime. The matter in dispute, which was long fought out with expert witnesses, was whether the defendants were entitled to use the term "blue lias" for the hydraulic lime manufactured in Cambridgeshire. The complainants contended that the "blue lias" formation was unknown in the county, and was generally confined to the Midlands. His worship held that the weight of evidence showed that "blue lias" was a generic term accepted by merchants, architects and engineers. There was no fradulent application of the name of a particular locality to the article sold. If the defendants had called their lime "Warwickshire" hydraulic lime a conviction might have followed. As it was, the summonses would be dismissed, without costs.

Mortar Made with Sewage.—Herbert Foster, of Five Ways, was charged at the Cannock Police Court recently with erecting certain walls with insanitary mortar. The case for the prosecution was that the defendant, who was erecting some houses at Blackfords, Cannock, had built some of the walls with mortar mixed with sewage matter instead of clean water. He was the owner of some houses which drained into a pit or catch-trap and then flowed into the sewer. This pit was open, and the mortar had been made with water taken from it. The defendant was served with a notice to at once pull down any portion of the new buildings which had been constructed with such mortar, but no notice was taken of the letter. The matter came before the Council, who resolved that the surveyor should serve notices to pull down the walls and disinfect the premises. Lord Hatherton said by-laws were made for the protection of people who could not protect themselves, and must be complied with. Even mortar mixed with injurious matter must be injurious to health. The defendant had been given every opportunity of making good the defective water while the walls were of little height. The order for pulling down the premises was granted.

Advertising Hoardings—At Greenwich last week Walter Hill and Co., Ltd., of Southampton Row, W.C., were summoned by the London County Council for erecting on the forecourts of certain houses in Sydenham a structure in contravention of Part III of the London Building Act. Mr. Chilvers, for the Council, said that the structure, which was erected without the consent of the Council, was an advertising hoarding, 12ft. in height and 336ft. in length, and was entirely in advance of the general building line. Mr. Bethune, for the defendants, argued that the hoarding differed in no respect from an ordinary builder's hoarding, and that it practically enclosed vacant land, as the houses, which belonged to the Leathersellers' Company, were in a bad condition and, with one exception, unoccupied. The houses were about to come down. Times were bad enough just now, and he did not think the owners could be blamed for seeking to get some income from the hoarding. He argued that the hoarding was not a structure to which the Act applied, and that it was a temporary erection. Evidence was called on both sides, and eventually Mr. Kennedy said that there was a degree of permanence about the erection, which had been standing six months and was very likely to remain. He regarded the hoarding as a structure, and could not recognise it as enclosing only vacant land. There would be an order to remove the structure within fourteen days, and the defendants would be fined 40s. and five guineas costs.

An Architect and his Building Club.—The case was recently heard at the Glamorgan Assize in which Mr. George Campbell Davies, architect, of Aberdare, claimed from the Pontyrhun Building Club £600 in respect of professional services rendered. Plaintiff had the idea of acquiring and laying out for building purposes a field belonging to the Mackintosh Estate. He got together a number of people who were wishful to build their own houses, and a building club was formed, the plaintiff being engaged as architect. The first difficulty arose when the plans of the proposed new houses were rejected as unsatisfactory by the Merthyr Urban District Council. Negotiations came to a standstill, and in the end the building club and the architect severed all connection. Plaintiff, at the request of the building club, had prepared plans, specifications, &c., for a number of cottages and semi-detached villas, made out bills of quantities, invited tenders, &c., and now the defendants said that he had been guilty of misrepresentation. Defendants put in a counter-claim for £146 15s. 6d. on the ground that the plaintiff had not been authorised to do the alleged or any work, and they also alleged that on account of the plaintiff's neglect they were unable to proceed with the erection of the houses. Learned counsel having addressed the jury, his lordship summed up. The jury returned a verdict for the plaintiff for £110 and costs on the claim, and for £21 15s. 6d. and costs for the defendants on the counter-claim.

Plans for a Bungalow.—In the King's Bench Division of the High Court of Justice on March 14th the case of *Parsons* v. *Jones* was concluded. This was an action by Mr. Charles F. Parsons, a young architect, who sued Mr. Jones, a gentleman of independent means, for drawings, plans, &c. supplied for building a bungalow and a boathouse at Lowestoft and other places. The defendant engaged an architect of his own, but as he did not complete the work rapidly enough the defendant came to plaintiff, who was the son of defendant's builder, and authorised him to get out the plans and drawings. The defence was that the plaintiff being the son of defendant's builder, the defendant understood that all the plans, &c., were charged for in the builder's prices. The evidence having been concluded, counsel for the defence addressed the jury, and said the charges made for these plans were clearly an afterthought, because the defendant had a receipt for the money paid by him for building, the receipt being given to include "all drawings, plans, &c." It was evident that after the money was paid the plaintiff's family had decided to make these extra charges, hoping they would be able to secure something. Mr. Cababé, in reply, said it was clear that the defendant had made himself liable, as the plaintiff had stated that in every single case he got the orders to make plans expressly from the defendant himself. On defendant's own showing the claim was an honest one, the question of the value being one for the jury. The jury gave a verdict for the plaintiff with £45 damages. Judgment was given for that amount with costs.

Professional Practice.

Richmond.—Six separate new buildings for the improvement of the accommodation at the workhouse are being erected on garden ground attached to the existing workhouse, by Messrs. S. N. Soole and Son. The building consists of a female infirmary block, lying-in ward, nurses' home, male infirmary, lunatic wards, and ambulance house and mortuary. The five blocks intended for habitation have been arranged so that they each run longitudinally north-east and south-west, and by this means the rays of the sun are enabled to shine during some part of the day on every side of each building. The female and male infirmary blocks are connected on each floor by corridors, from which short branches connect to the lying-in ward and nurses' home. Along the centre of the ground-floor main corridor a trench is formed, in which the various mains will be placed; this will enable any part of the mains to be readily examined. To provide for the supply of water for domestic purposes beyond the ordinary storage tank a large tank to contain about 8,000 gallons has been provided at the top of the sanitary annexe attached to the female infirmary. The female block comprises ground, first, and second floors, each containing a large ward for twenty-four beds, a smaller ward containing three beds, a day-room and a duty-room, besides larder, linen store, brush store, and the necessary sanitary accommodation. Access to the twenty-four bed ward is obtained by folding doors from the landing at one end, and at the other opens on to an external balcony with a south-east aspect. The walls will be plastered, and the junction between the floor and wall, which is so difficult to keep clear of dust, will be formed with a slight hollow, so that no corners will be left, and perfect cleansing can be readily performed. The duty-room is so placed as to be approached direct from the landing, and at the same time immediately adjoining the large ward, from which it is divided by a wall in which is placed a small window for supervision purposes. This duty-room will be completely fitted with sink, dresser, and small range, and will be independent of other parts of the house except for general cooking purposes. Opening off the same landing is the three-bed ward before referred to, which will be finished off in a manner very similar to the large ward; separate w.c. and lavatory accommodation has been provided. The day-room, 20ft. in length, has a bay window at one end, and opens off the same landing. The larder and stores are conveniently arranged opposite the day-room, and adjoining these is a short branch passage leading to the main sanitary annexe, which provides complete accommodation on each floor. Access to this sanitary annexe may be obtained from the landing without having to pass through any ward or room, and is separated from the main building by a cross-ventilated lobby; this also affording another outlet to the balcony, contains a bath-room, a range of lavatory basins, two w.c.'s and a slop sink. It is intended to line the walls of the sanitary apartments with white tiling. The landing from which all these rooms are directly approached also opens direct on to the corridor at the various floor-levels, giving easy access to the other buildings. The flooring, as also that of the sanitary annexe and w.c.'s, will be of terrazzo, with a hollow formed next the walls to prevent accumulation of dirt. The only accommodation provided below the ground-level is a coal-cellar (under the sanitary annexe) and a boiler-house (under the stores and a portion of the ground-floor landing). The entrance to this boiler-house is formed in the external wall, and not obtained by internal stairs, so that this accommodation is effectually separated from the main building. In this boiler-house will be placed the boilers and circulating cylinder required for separate hot water services for warming purposes and the supply of hot water for washing and domestic purposes, and branches will be taken from these to the next block, so that separate boilers for that block will not be necessary. The lying-in ward is placed next in order to the female infirmary and is approached by a short branch from the main corridor. The accommodation of this block comprises a lying-in ward for six beds, two labour rooms, duty room, larder, bathroom and store. The ward and labour rooms will follow the general description of the large wards in the female block. The dispensary is arranged in this block, but is approached by a separate entrance from the corridor. The nurses' home is placed between the lying-in ward and the male infirmary. This block consists of three floors, from each of which access is obtained by short branches to the main corridor. The general arrangement on each floor is a central passage or corridor, with the various rooms opening directly from it. The ground floor contains nurses' dining- and sitting-rooms, with separate dining-room for the subordinate nurses or wardmaids, and a private sitting room with bedroom attached reserved for the superintendent nurse. A kitchen is provided next the nurses' dining-room, with serving hatch thereto, and larder attached. A good linen store and bootroom are also provided, and at the end of the block lavatory and w.c. accommodation has been arranged. On the first floor are arranged 12 separate bedrooms, with bathroom and w.c. opening from the landing opposite the stairs, and on the second floor are 12 more bedrooms and similar sanitary accommodation; but of these 12 rooms four are arranged for two beds each, thus providing for 16 wardmaids. The only accommodation provided in this block below the ground level is a boxroom and coal-cellar. The male infirmary is placed at the other end of the main corridor, which runs in a direct line from the female infirmary. This building is very similar in general arrangement to the female infirmary before described. The accommodation for inmates is in every way similar, and offers, as the other block, provision for 81 inmates. The fifth block is that provided for the reception of lunatics. The building consists of a ground-floor only, and comprises two separate two-bed wards, with attendant's room adjoining each, fitted with supervision window. There is also a padded room provided. The sixth building is a small detached erection in the corner of the site, and only contains the ambulance house and mortuary. The whole of the buildings are intended to be erected in stock bricks, with red-brick facings, relieved by lintels and strings of Portland stone, and the roofs will be covered with green slates. The architect is Mr. Edward J. Partridge, F.S.I.

A new Church at Great Bridge, Tipton, is to be erected on a site in the New Road, to be dedicated to St. Luke. The chancel is now being erected at an estimated cost of £600. The architecture of the church will be an adaptation of old English style, and the work is being carried out by Messrs. Smith and Son, of West Bromwich, to designs of Mr. Jabez Pearson, of Great Bridge.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Floor for Gymnasium.

MANCHESTER.—A. V. R. writes: "I am at present preparing plans for a gymnasium in connection with a lads' club. The present gymnasium floor is of concrete, and although gymnasium mats are used, a somewhat severe shake is experienced by the boys when jumping from the different apparatuses; this I wish to avoid, or at any rate to minimise as much as possible. Would a floor be suitable if constructed of 5in. of concrete in which are embedded 4in. by 2½in. fillets carrying 1in. flooring boards with thick roofing felt under them?"

The construction described by querist would be suitable, but the space below the boards being too shallow for ventilation the fillets should be creosoted to prevent them from decay. There may be a slight smell at first, but not more than would be caused by the roofing felt alone. HENRY ADAMS.

Builders' Book-keeping.

MALTON, YORKS—F. N. R. writes: "I manage a business consisting mostly of jobbing work, and wish to keep the cost of each item. Which is the simplest method of doing this? The men use time sheets, but are, as a rule, very poor scholars."

The querist apparently wishes to keep separate the cost of each trade in each item of repair. Unless he has plenty of time on his hands, and plenty of patience, he is advised to make the separate items as few as possible. Workmen seldom realise the necessity of keeping strict account of time and material, and generally resent having to do what they term "office work." Unless there is in each, or any, job some one or more items which stand out quite distinct and separate from other work, no really useful purpose is served by microscopic dissection. The simplest method that can be recommended (this is, of course, without knowing any of the querist's special requirements) is to have a general order book, each job as entered being provided with a number. Official order slips (printed ones soon save the cost of printing) bearing the number should be issued to the leading tradesman on the job, and it should be his business to see that each man on the job books his time to that number. To take care of distinct sub-items in jobs, a sub-order book should be provided—one for each trade if the magnitude of the business requires it—and, as an illustration, each rod set out by carpenter or joiner might be the subject of a separate sub-order. When the job is complete, the workman holding the order slip should return it to the office, bearing on the back an account of materials used, or, where several trades are engaged, each leading man in his trade might be required to render the account of materials on the back (or face) of his time sheet. Use of scaffolding, unless on a job of some extent, is best charged up as a percentage on the cost of the job, or upon the cost of the time, the latter being the preferable though not the most usual method.

H. E.

Creosoting Timber.

KILMARNOCK.—WOODSTOCK writes: "Is there any method of creosoting timber other than in a specially constructed chamber under pressure? What kind of oil is used?"

The proper method of creosoting timber is to place the logs in a closed wrought-iron cylindrical vessel like the shell of a Lancashire boiler, say 7ft. diameter and 60ft. long, with a door at one end and tram rails laid inside along the bottom. The timber is placed upon trolleys with chains or iron hoops over the top to keep the timber from floating when the creosote is let in, and the trolleys are run into the cylinder. The door is then shut and a vacuum of 7 or 8lbs. per sq. in. is created; after a short interval creosote (oil of tar) at a temperature of 120degs. Fahr. is allowed to enter, the vacuum is maintained until all the timber is submerged, and then the pressure is raised to about 150lbs. per sq. in., both the temperature and pressure being maintained for 6 to 10 hours. The usual specification clause is, "The whole of the piles are to be creosoted under pressure with not less than 8lbs. of creosote to each cubic foot of timber," but the amount actually taken up will depend very much upon the quality of the timber; for instance, good Memel will take up comparatively little, while coarse Dantzic with a large proportion of sap will absorb a considerable amount. Timber is not creosoted if merely plunged in a tar tank; it should show distinct signs of permeation when cut through the middle, and this can only be obtained when the creosote is forced through the whole length of the timber. In the early days of creosoting, known then as the Bethell process, the end of the log was covered with a pressure-tight cap and the liquid forced through by pumping, but this was too slow for business purposes. A new method of preserving timber, which is likely to displace creosoting as being cheaper and better, is Haskin's process of vulcanising (or Haskinising). "It consists in placing raw wood in a cylindrical treating chamber, made of boiler-plate, of any size, or numbers of them placed together according to the output required, and submitting the same for a few hours to a medium of superheated, circulating, compressed air, which effects a chemical change. The air-pressure employed prevents evaporation, while the intense heat passes through to the centre of the timber, causing the constituents to organise into an oleaginous compound, saturating the fibre and filling the pores. In cooling down under the same pressure the new compound becomes consolidated with the fibre, thus indurating, strengthening, perfecting, beautifying and preserving the wood from decay. The germinative principle inherent in the sap is destroyed, all fungi, germs or insect life are killed, and no offensive odour is emitted from the wood after treatment." Briefly, it may be termed an internal autogenic dry creosoting. HENRY ADAMS.

Artificial Seasoning of Timber.

CROYDON.—SUGGESTIONS writes: "Which is the best means of forming a drying-room for timber? Is a system of hot-water pipes with a fan to make a current a good one? If so, should the inlet be arranged with a coil of heated pipes for the air to pass over?"

The method of artificially seasoning timber is not to be recommended, especially in a room heated above the temperature to which any wood is ever likely to be subjected, as the warm stagnant atmosphere retains the evaporated moisture. There seems no objection to the admission of hot air in the lower part of the room, providing it is permitted to escape above, so carrying off the absorbed moisture; but I have seen timber (battens and boards) much injured in this way, especially when not laid flat, but stacked edgeways. The best means of forming a drying-room is to have built-up piers about 3ft. to 4ft. wide and two bricks thick to carry the roof principals, these being about 12ft. apart and filled in with louvre boards and the eaves to protect the timber from sun and rain. The arrangement of hot-water pipes with a fan as suggested would probably be a saving in cost where the spent steam from the engine-room could be utilised, but care should be taken to carry off the evaporation of moisture. Tarbuck gives the velocity of 100ft. per second as best for hot air. W. E. C.

Testimonies of Study.

NEWTON ABBOT.—IN DOUBT writes: "I am about to make drawings of the Doric, Ionic and Corinthian Orders as 'Testimonies of Study' required by the Royal Academy and the R.I.B.A. It is my intention to copy them from Mr. Phené Spiers' book, but I am in doubt as to the best examples to select for the purpose; that is to say, should they be Greek or Roman, and, if the latter, would it be advisable to copy the Orders of Vignola and Palladio or those obtained from the original remains? In the statement of particulars in the R.I.B.A. Kalendar the following occurs: 'and details to three times the scale of the columns.' Does this refer to the enrichments of mouldings or the mouldings themselves?"

Greek examples are best, then Roman. The Orders of Vignola and Palladio are not truly Classic, but Italian Renaissance. For the R.I.B.A. any spare space upon the sheets should be well covered with details, both of mouldings and enrichments. If time and money for the purpose can be afforded, it is best of all to measure the Order from the Mausoleum of Habiamassus, now in the British Museum, for one of the sheets, permission to do so being readily granted on written application to the Director of Greek and Roman Antiquities, accompanied by a letter of recommendation from some householder whose identity can be easily established. G. A. T. M.

Estimating for Small Jobs.

HULL.—STUDENT writes: "Which is the proper way to approximately estimate for small alterations—for example, a shop front to be put in, and a few walls altered?"

There is no easy way of forming a reliable estimate for alterations to existing buildings; the cost necessarily varies according to the special conditions of each case. Having obtained full particulars of the alterations required, the building must be carefully inspected as to its general construction, condition and surroundings. Any local difficulties which may increase the cost of carrying out the work should be noted. Allow for providing, fixing and removing temporary shoring or strutting to all walls or floors affected by the alterations, and making good to same. Provide for removing the existing window and fittings, also for taking down old brickwork, including cleaning and stacking the bricks for re-use. Measure the quantity of new brickwork required, also the toothing and bonding in of the new work to old walls. The proposed new shop front, door, bressummer and finishings to be measured and priced according to their several materials and workmanship. Ascertain the quantities of glass, painting, &c., together with any alterations to existing gas-pipes or new fittings required. Provision should be made for any repairs, additions, or renewals to floors, plastering, papering, &c., as may be necessary. T. E. C.

Right to Use Well.

HARD LINES writes: "We took a cottage as a branch office in a country place on a three years' agreement. We gave up the garden behind voluntarily, and—unfortunately for us—this was put in the agreement. We have had access to the well in the garden from the commencement, and without hindrance or protest from our landlord, who lives next door. He has now put up an obstruction to stop our water-supply from this well. Can he do this legally, and could we at our own expense have water laid on from pipes now in the public road for our own use without his sanction or interference?"

You do not appear to have acquired any right to use the water-supply in question. You could have water laid on at your own expense in the manner proposed. A. O. H.

Masters and Men.

The Cement Trade Dispute at Rochester.—The cement factories at Frindsbury, near Rochester, belonging to the Associated Portland Cement Manufacturers, Limited, have been shut down and the day-work hands dismissed, owing to the strike of piecework hands, who refused to accept lower wages. About 600 men are affected.

Dispute in the Gritstone Trade.—Strike notices were served recently on the Rowsley Masters' Federation in the gritstone trade affecting a large number of quarries, yards, masters, and men. The notices will expire the first week in April. The dispute is a demand for higher wages. The quarrymen went out on strike at the latter end of last year on new regulations formulated by the federation. As trade is brisk the outlook is serious.

Bricks and Mortar.

APHORISM FOR THE WEEK.

They make a front just like St. Paul's,
Or like Westminster Abbey,
And then as if to cheat the Lord
They make the back part shabby.

C. H. SPURGEON on Chapel Building [Committees.

The Housing Problem Again. THE housing problem formed the subject of a paper, to which the Howard Medal has been awarded, read to members of the Royal Statistical Society last week by Dr. J. F. J. Sykes. The author referred to the legislation on the subject since 1851 and traced its development, suggesting that further law was required to regulate the conditions under which houses originally intended for the occupation of a single family of a more wealthy class were adapted for the use of one or more sets of poorer occupants. In the past fifty years London municipalities had constructed dwellings containing 6,132 rooms, organised private action having provided 50,402 rooms. The cost of construction varied from £35 per room in the country to £135 in London County Council tenements. He disapproved of single rooms as tending to degradation and decadence, and suggested that the powers now given to enable private associations to borrow public money for the construction of workmen's dwellings should be extended so as to apply not only to freehold, as at present, but also to long leasehold property. In the course of the discussion which followed, Mr. W. W. Bruce said the London County Council had housed as many as they had displaced. The action of the late Board of Works in selling sites had complicated matters. A vast value in London was being put to an improper use in housing people on extremely valuable land, especially as the result of the Holborn to Strand improvement, where the value had been written down. It was three times the housing value assigned it. The only cure was to get the people further out, and set the land free for the purposes intended. He did not think that municipal enterprise would interfere with private undertakings. Lord Avebury said that the class housed was not the class dishoused. If local authorities made it clear that they did not intend to compete the case would be different, but as it was their regulations made it very difficult for private individuals to carry out the work, whereas private enterprise would do much to solve the problem. Sir H. Burdett urged the case of the poor, who must live nearer the richer quarters to do the rough work, and he considered that the ground landlord should be made to live up to his property, and made to provide for those he displaced

Ugly Cottages. MR. J. HENRY BROWN, writing to the "Nottingham Daily Guardian," points out that Nottinghamshire is about to be the centre of a very great coal trade, "and perhaps scores of our hitherto picturesque villages will undergo a transformation by the building of colliers' cottages. Hitherto the architecture of these cottages has been a minus quantity. Anything more outwardly hideous than the long rows of grimy brick cottages and their black Welsh slate roofs it is difficult to conceive. The decadence seems to have set in within the past thirty years, and hereabout what may be termed the native cottage architecture is very pleasing. They are built of a local yellow sandstone, and have bright red Dutch-tiled roofs, also made in the neighbourhood. The contrast is complete. I would ask if there be not any great landowner, colliery company, speculative builder, or small proprietor who will not, for example's sake, rescue the country from the 'close clinging damnation,' to use Ruskin's bold phrase, of the collier's cottage. . ... It seems to me that the man who first introduced the black Welsh slate roof was a malefactor of the highest degree. I should like to think he has had his day; and that having utterly uglified Derbyshire it ought to be a matter of county pride to keep him out of Nottinghamshire."

A Scotch Parthenon. IN the course of the lecture on the work of Professor Cockerell, delivered recently before the Edinburgh Architectural Association, Mr. J. M. Brydon, F.R.I.B A., referred to the National Monument on Calton Hill, Edinburgh, as evidence of Cockerell's participation. He admitted that his connection with the work came as a surprise to him, as doubtless it would be to some of his audience. Cockerell's original sketches and drawings (which were exhibited to the meeting) were the first idea of the monument, which was to be a reproduction of the Parthenon. The foundation-stone was laid in 1822, and Cockerell's sketches enabled one to see the mode by which the interior of the monument was intended to be lighted. The method seemed to forestall the clerestory theory of the lighting of Greek temples. There were also shown the working drawings by Playfair of the portion erected in 1826. Between the preparation of Cockerell's sketches and the laying of the foundation-stone of the actual commencement of the work from Playfair's drawings, said Mr. Brydon, there was an interval of some years, and one could only conjecture that something had occurred which caused the transference of the work from one architect to the other, or that the two architects went in conjunction under some arrangement, the traces of which were now lost. The two must have been congenial spirits, alike in their knowledge and devotion to the study of Greek art Vaulting ambition again, however, o'erleaped itself. The monument was never completed, and to-day it looked more like the ghost of the Parthenon that was. Nevertheless the spirit of the Greek temple was in the fragment on the Calton Hill. Its exquisite proportion, its beauty of detail, showed the artist's true spirit. There was no doubt the intention was to represent the Parthenon. In the elaborate account of the laying of the foundation-stone there was curiously not a word said about the architect. It had always been his impression that they began the building with the idea that they were going to make a reproduction of the Parthenon, and that they went on until the money stopped. Playfair's drawing was the contract drawing for exactly the piece that was built and nothing more. In the discussion following upon the paper, Mr. Hippolyte Blanc said the information about the monument was certainly new to him. The question of the completion of the monument had been recently opened up as a suggested memorial to the late Queen, but he could not but feel that with the evidence of the intention to build only a certain part of the structure there was a sacred thought in the minds of those who had schemed the monument that it should never be other than the suggestion of a ruin.

The World's Great Memorials. AN interesting account of the great memorials of the world, by Mr. Claude Phillips, was published last week in the "Daily Telegraph." Passing over the august civilisations of Egypt, of Chaldea, of pre-archaic Greece, we come at once to classic Greece. Here the typical instance is, of course, the Mausoleum, that world-famous monument raised by Artemisia, Queen of Caria, to her beloved Mausolus, the size, splendour and unusual construction of which demanded the admiration of posterity. The wonderful frieze and fragments in the British Museum prove that the Mausoleum was second in exquisiteness of plastic adornment to the Parthenon alone, and worthy of the four great sculptors, Scopas, Leochares, Bryaxis and Timotheus, who were employed upon it. Of the Mausoleum of Hadrian, the core of which, stripped of all its sumptuous enveloping decoration of marble and gilt bronze, and its wilderness of statues, survives in the castle of S. Angelo at Rome, there is nothing new to be said. The next mausoleum to be mentioned is the Taj-Mahal of Agra, built by the Emperor Shah-Jahan to enshrine the remains of his favourite wife, Mumtaza-Mahal, and his own, when after an interval he was joined to her again. This well-known building is certainly one of the most beautiful in the world.

It was very much the custom in the fifteenth and sixteenth centuries for princes and rulers to care themselves for their tombs and their monuments, thus securing, so far as in them lay, immortality of a kind. The instances are many; but we need only take the magnificent tomb planned, if not erected, by Henry VII., for himself and his Consort, underneath the too ornate vault of his own chapel annexed to Westminster Abbey. The splendid monument of gilt bronze and marble fashioned by the Florentine Pietro Torrigiano and his assistants needs no new praise, since it is among the most familiar things in London. A still more celebrated monument is that which Pope Julius II. ordered of Michel Angelo; the vicissitudes in connection with the inception and the execution of this great design constituting one of the most curious chapters in the history of the mighty master and of Italian art. We possess, at any rate, if not the complete conception of Buonarroti, three fragments which are among the most famous things in art—the "Moses" in S. Pietro in Vincoli at Rome, and the two so-called "Slaves," in the Renaissance sculpture hall of the Louvre.

A German and a Russian Memorial. ONE of the most celebrated monuments of the later Renaissance — and yet, as a whole, a thing to take warning at, rather than to admire—is the cenotaph of Maximilian I. in the Hofkirche, at Innsbruck, which was not completed until nearly the middle of the seventeenth century. It is a grandiose conception this empty tomb of bronze and marble, guarded on either side by a long row of great bronze figures of kings and heroes. But somehow it has failed in the working out, and what might have been sublime is very nearly ridiculous. A grand monument dedicated to a great monarch is that which the Empress Catherine II. erected to the founder of Russia's position as a world-power, Peter the Great. The eighteenth century, which produced, especially in France, many works of this type of the highest elaboration—chiefly equestrian statues of Louis XIV. and Louis XV., which have long since disappeared in the vortex of the Great Revolution—can show nothing as simple and as expressive as this equestrian statue of the Tsar crushing beneath his horse's hoofs the serpent of conspiracy, and reigning in confidently on the very edge of the rocky precipice. And, strange to say, it is by Etienne Falconnet, the sculptor of the softly voluptuous "Baigneuse," of "L'Amour Menaçant," and other pretty trifling things of the same order.

Modern Monuments. IN modern times—and chiefly within the last fifty years—a whole series of monuments of vast proportions and great material magnificence have been erected to the memory of Sovereigns. He who knows Berlin assuredly knows the splendid "Frederick the Great," erected in 1851—the masterpiece of Rauch. At the side of the Nevski Prospect at St. Petersburg was erected, in 1873, an extensive and sumptuous monument to Catherine II. Here, beneath the colossal full-length statue of the Empress, range themselves nine great figures representing her most eminent coadjutors. Unqualified admiration cannot be extended to the monument erected at Vienna, in 1888, to the Empress Maria-Theresa, from the designs furnished by Zumbusch and Hasenauer. Perhaps the most gigantic, and certainly the most costly, monument that has been dedicated to a deceased sovereign in modern Europe is that which impoverished Italy has erected—but not yet completed—to the memory of King Victor Emmanuel. Already this has, it is estimated, cost something like twenty millions of francs; and this sum is but half, or less than half, of what will have to be expended before the monument can be considered finished. An immense artificial platform rises nearly 80ft. above the Piazza di Venezia, and on this is placed a gigantic equestrian statue of the *Re Galantuomo.* Let it be hoped that the memorial to Queen Victoria will be a credit to the present generation and a worthy specimen of the art which is reviving in our midst.

Keystones.

The West Front of St. Joseph's Church, Brighton, in Elm Grove, has been completed; the staircases, doors, &c., are now more conveniently arranged.

Stockport Infirmary Competition.—On page 107 of our issue for the 13th inst., C. W. Hardy was erroneously printed for Mr. C. W. Harvey, who gained the third premium in this competition.

Hull Royal Infirmary Competition.—Referring to the paragraph on page 127 of our last issue, Messrs. Botterill, Son and Bilson, of Hull, inform us that, though invited to do so, they did not send in a design for this competition.

Midhurst Building By-laws.—At the quarterly meeting of the Midhurst Rural Council it was agreed "That a committee be appointed to consider the advisability of amending the building by-laws, in accordance with suggestions made by the Royal Institute of British Architects."

Ashton Church has been reopened after partial restoration. The roof was in a very bad condition, letting in the water in many places. The windows also let in wind and rain. A plaster ceiling, put up many years after the church was built, had to be removed A very ancient oak ceiling has been thoroughly restored with English oak, and the bosses renewed. Mr. E. C. Ponting was the architect. The work of restoration is not yet completed. About £450 has been already spent.

The Architectural Association of Ireland held its last ordinary meeting of the session, prior to the election of officers in May, last week, the president (Mr. Frederick Batchelor) in the chair. After the election of new members and transaction of general business Mr. R. Caulfield Orpen gave a paper on "Architectural Amenities," or the "pleasurableness" of the profession. Mr. T. E. Hudman proposed a vote of thanks, which Mr. Holloway seconded. Messrs. Shaw (Drogheda), Webb, O'Callaghan, R. M. Butler, and T. P. Sheridan also joined in the discussion.

Libraries given by Mr. Carnegie.—New York City has accepted an offer from Mr. Carnegie to construct sixty-five libraries in Greater New York at an average cost of $80,000, if the municipality will provide the sites and will apportion $500,000 annually for their support. Mr. Carnegie does not stipulate in what parts of the city the buildings are to be located, but it is understood that he desires as many as possible to be placed within easy reach of the labouring classes. There are at present in New York and Brooklyn eighty-five libraries of all kinds.

R.I.B.A. Conditions of Contract.—At the meeting of the Royal Institute of British Architects to be held on April 1st the amendments to the conditions of contract will be considered. The Council, having finally withdrawn from further negotiation with the Institute of Builders, no longer bring forward the amended clauses, published in our issue for December 12th last, with a view to securing a uniform form of contract, but submit them for the consideration of the general body of their members, with the view to such amendments being incorporated in the Royal Institute Form of Contract as may be found desirable.

The Institute of British Decorators.—The annual general meeting of members resident in the northern district of this Institute was held in Leeds last week, when the following were elected officers for the ensuing year:—Chairman, Councillor John Smith (Sheffield); vice-chairmen, Alderman Kendall (Huddersfield); Thomas Preston (Burnley), George G. Laidler (Newcastle-on-Tyne), and George F. Allan (Stockton); treasurer, George Spencer (Bradford); secretary, Thomas Foster (Padiham); committee, Messrs. J. G. Cole (Newcastle); James Tetlow (Huddersfield), John Ratcliffe (Bolton), W. H. Cunliffe (Blackburn), and John Cantrill (Manchester). In order that the objects of the Institute may be promoted, the committee intend to arrange for lectures to be given in some of the principal towns of the northern district next winter.

New Schools for Hadleigh.—We understand that the very Rev. Dean Milburn Blakiston, of the Rectory, Hadleigh, Suffolk, intends building new church schools immediately for Hadleigh. The plans to accommodate 700 children are being prepared by Mr. Arthur H. Ryan-Tenison, A.R.I.B.A., of 7 Great College Street, Westminster, S.W.

The School for the Indigent Blind at St. George's Circus having been acquired by the Waterloo to Baker Street Railway is to be demolished. The nucleus of the present school buildings was erected about 1812. In 1834 additional ground was purchased and the schoolhouse remodelled so as to form a portion of a more extensive edifice in the Tudor or Domestic Gothic style. The designer was Mr. John Newman, F.S.A. A comment on this matter was published on page 37 of our issue for February 20th last.

The Amersham Grove Sunday School in Ludwick Road, New Cross, S.E. has been extended by the addition of a hall 30ft by 19ft., entered from a new porch, and having a small platform; and two smaller class rooms forming an adjunct to the existing large hall, but divided off by curtains from it, and by a panelled wood partition from one another. The contract cost was £710. The architects for the original school and for these additions are Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5 Clement's Inn, Strand, W.C.

South Shields Competition. — Mr. John Belcher, A.R.A., the assessor appointed by the South Shields Corporation, has given his award in regard to the 72 plans submitted for the erection of the new municipal buildings on the Ogle Terrace site at a cost of about £30,000. The awards were as follows:—1st, Mr. E. E. Fetch; 2nd, Mr. R. Savage; and 3rd, Mr. Louis Ambler, all of London. The Municipal Buildings Committee of the Corporation have passed a resolution to the effect that Mr. E. E. Fetch be appointed to carry out the works of the buildings subject to the approval of the Town Council.

The Leeds and Yorkshire Architectural Society.—The following have been elected officers of this society for the coming session:—President, Mr. T. Butler Wilson; vice-presidents, Mr. C. B. Howdill and Mr. R. Wood; hon. treasurer, Mr. W. H. Thorp; hon. librarian, Mr. W. H. Beevers; hon. secretary, Mr. H. S. Chorley; council, Messrs. F. W. Bedford, G. F. Bowman, A. E. Dixon, A. Hill, S. D. Kitson, and W. G. Smithson; Messrs. H. Ambler and H. E. Illingworth hon. auditors. Mr. Bedford, it will be noticed, has been succeeded by Mr. Chorley as hon. secretary. The latter's address is 15 Park Row.

A new Bandstand at Bradford is to be erected in Peel Park. Mr. F. E. P. Edwards, A.R.I.B.A., the City Architect, prepared the plans which provide for a larger structure than the present one. It will be 24ft. in diameter, and it will be raised upon a stone base nearly 4ft. above the ground. The new stand will be provided with a convex sounding-board of pitch pine beneath the roof inside. In shape the new stand is to be a decagonal structure of light appearance, with a roof supported by ornamented cast-iron pillars. The cost of the stand, the boundary wall, and the two flights of steps will be about £460.

Housing in Dudley.—A Local Government Board Inquiry was held recently into the application by the Dudley Town Council to borrow £5,071 for various street improvements, &c. Of the amount £706 is to be devoted to making two new streets on the Buffery estate, and £3,700 to purchasing property at the corner of Wolverhampton and High Streets. The property at the corner of the two streets named was acquired to relieve a very congested place, and cost £3,600. The two streets on the Buffery estate are being made on condition that the landowner gave up a piece of land for the benefit of the recreation ground, and that he would erect 50 houses on the estate. It is hoped that eventually 200 houses will be built there at rents of 5s. 6d. or 6s. a week.

New Patents.

These patents are open to opposition until April 27th.

1900.—Smoke-consuming Firegrates.—6,891. W. H. Sharp, 29 Russell Terrace, Enfield. This invention relates to a fire-grate which is fed by coal or other fuel being inserted at the bottom, instead of on the top of the fire. This is made possible by a "comb" and a "lift." The former is pulled out from behind the grate, the fuel is laid on it, and is then raised by the "lift." It is a special feature of the device that the parts may be packed in a small compass for shipment.

Drain-testing Apparatus. — 11,222. R. Ravenor, Speenhamland, Newbury, Berks. The object of this invention is to enable smoke rockets to be used effectively without danger of exploding any unconsumed gas emitted from the rocket, and also to enable testing with air and smoke, separately or combined, to be carried out at high or low pressure. The usual blowing apparatus is employed, but immediately below the rocket, when in position, there is a receptacle holding water, so arranged as to catch and extinguish any sparks that may be emitted. A number of rockets can be fired sequentially without disturbing the connection with the drain. The apparatus is very compact and portable.

Door Stops.—17,729. J. Cook, 98 Market Street, Chorley, Lancs. When doors are flung open it sometimes happens that the key or handle hits the wall and breaks the plaster or other surface. To prevent this a suitable resilient stop is fixed to the skirting board.

Treads for Staircases.—20,732. A R. Robinson, 12 Norfolk Street, Strand, W.C. The treads of staircases, being subject to the most wear, naturally waste first According to this invention, which has special reference to stone and concrete staircases, dovetail grooves are made in the top of each step and filled with wood strips. To these the treads proper are fixed with screws, being preferably arranged in sections so that any portion which is worn may be easily replaced.

The following specifications were published on Saturday last, and are open to opposition until May 6th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—4,173, Cameron, Commin and Martin, apparatus for the treatment and disposal of sewage. 4,260, Hicks, automatic gas lighting. 4,301, Bromfield, gates. 5,817, Javal, apparatus for generating acetylene gas. 5.852 Green, seat standards for water-closets. 6 343, Pollard, Pollard and Pollard, chimney cowls. 7 096, Grünberg, apparatus for producing artificial stone free from air. 7,657, Burbey, cord grips for electric-lamp holders, ceiling roses, &c. 7.833, Tannett-Walker, travelling cranes. 7 904, Brazier, valves or valve casings for ball cocks of cisterns. 7.997, Kammerer, electric gear for cranes. 10.591, Sieverts, incandescent gas-burners. 12,581, Talbot, means for lighting incandescent lamps. 14,485, Bennett and Jones, system of automatically lighting gas-burners. 15 225, Bremer, electric arc lamps. 17 632, Kaufmann, tripod stands for theodolites. 18,947, Deike, Mitchell and Alexander, acetylene gas-generating machines. 20,778, Heany, electric arc lamps. 20.779, Heany, electric arc lamps. 21,830, Morley, automatic fire-lighting apparatus. 22.585, Brewster, flexible supporting structures for electric lamps. 23,245, Howorth (*O. Titel and Wolde*), purification of the air of rooms. 23 599, Lester, smoke consumers.

1901.—51, Göhler, gas producing apparatus. 683, Hemming, drying sheds for bricks.

A new Congregational Church at Ilford has been erected at a cost of about £10,000. The peculiarity of the church is that it is built in octagonal form, supported on eight pillars. There is a very lofty dome roof, weighing one hundred tons.

Engineering Notes.

The Extensions to the Grimsby Workhouse Infirmary are being warmed and ventilated by Messrs. E. H. Shorland and Brother, of Manchester.

Bethany Church, Port Talbot, has been fitted by Messrs. John King, Ltd., engineers, of Liverpool, with their well-known "small tube" hot-water heating apparatus.

Richmond and Electric Tramways. — The London United Tramways Company have offered to the Richmond Corporation in consideration of their assent to the Bill to enable the company, among other things, to construct electric tramways from Richmond to Hammersmith, that they will not insist on establishing the overhead system in Richmond, but will allow the Council to decide what system shall be adopted. The company also offer to carry out street widenings in the borough at a cost of £30,000.

Openings for Electrical Engineers in Spain.—Mr. Harrison, commercial attaché to the British Embassy at Madrid, says in his report on the trade of Spain that the many openings in the electrical business in Spain are just what are necessary for young men to fit themselves for more important posts. Young English engineers and mechanics who would not object to pass a few years in quiet towns and villages would probably find ready employment under some of the great firms interested in the electric-light business. Avoid Madrid, says Mr. Harrison, for it offers few openings for foreigners, but go to any other town in Spain.

George's Dock Improvements, Liverpool.—The scheme for continuing Water Street across the George's Dock site has been entered upon, and the extension, which is to be 80ft. wide and about 320ft. long, will undoubtedly be completed by September next. The roadway will be supported on concrete piers and arches, the foundation for the piers being carried down through the clay to the solid rock. Under the supervision of the city engineer excellent progress has been made with the work below the level of the bottom of the dock, but it is not intended to start operations above the level of the dock bottom until all risk of damage to the concrete from severe frost has disappeared. It may also be mentioned that it has been decided to so construct the piers and archways underneath the roadway as to provide a tank for the storage of, say, two million gallons of salt water, impounded from the Mersey for use in connection with the Corporation bathing establishments.

London Water Supply: Deputation to Mr. Walter Long.—On Thursday last a deputation from the London County Council waited upon Mr. Walter Long, the President of the Local Government Board, in order to lay before him a resolution passed by the Council that the Government should allow the Council's Purchase Bill to pass second reading, and to be referred to a Committee of Parliament. Mr. Long said he deeply regretted that the Council had not accepted the recommendations of the Royal Commission, instead of standing by the Bill which was now in Parliament. He did not see how he could ask the House of Commons to pass that Bill, nor did he see that he could ask the Government to remain silent when the Bill came before the House. His decision was the result of careful consideration, and he was very sorry that a *modus vivendi* had not been found between the companies and the Council. Under the circumstances, he saw nothing to justify him in altering the opinions he expressed when he last met them.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
		BUILDING.		
Mar.	29	Heath Town—Extending School	Wednesfield School Board	F. H. Lynes, Gresham Chambers, Lichfield Street, Wolverhampton.
,,	29	London, E.—Nurses' Home, &c.	St. George's-in-the-East Guardians	J. H. May, 249½ High Holborn, W.C.
,,	29	Hull—Refuse Destructor Buildings	Corporation	A. E. White, City Engineer, Town Hall, Hull.
,,	30	London, N.W.—Orphanage	St. Pancras Female Orphanage School	S. G. Goss, 3 Broad Street Buildings, Liverpool Street, E.C
,,	30	Chew Magna, Bristol—Enlargement	School Board	W. E. Milton, Clerk, Chew Magna.
,,	30	Whitehead, Ireland—Premises	Fleming and Co.	J. Russell, 22 Waring Street, Belfast.
,,	30	Armagh—Dispensary, &c.	Guardians	W. Calvert, Clerk's Office, Workhouse, Armagh
,,	30	Brighton—Motor Room, &c.	Corporation	F. J. C. May, Town Hall, Brighton.
,,	30	Consett, Durham—Conveniences	Urban District Council	W. S. Shell, Surveyor, Parliament Street, Consett.
,,	30	Durham—Lavatory	Corporation	City Surveyor's Office, 22 Market Place, Durham.
,,	30	East Retford—Gasholder Tank	Gas Committee	J. B. Fenwick, Gas and Water Engineer, Retford.
,,	30	Gosforth, Northumberland—Painting, &c.	Police Station	Superintendent Hay, Police Station, Gosforth.
,,	30	Islington, Devon—Boarding House	Mrs. Helleir	S. Segar, Architect, Newton Abbot.
,,	30	Risca, Mon—Alterations, &c.	School Board	G. Rosser, Architect, Risca.
,,	30	Worthing—School for 360 Children	School Board	R. S. Hyde, Architect, Eriswell Road, Worthing.
,,	30	West Sussex—Police Cottage	County Council	W. B. Purser, 31 Bedford Road, Horsham, Sussex.
,,	31	Lisnaskea, Ireland—Residence	—	Rev. J. Coulter, Methodist Manse, Newtownbutler.
April	1	Hull—Premises	T. Gillett	B. S. Jacobs, Architect, Lincoln's Inn Bldngs, Bowlalley Lane, Hull
,,	1	Moss Side, Manchester—Cell House, &c.	Urban District Council	H. B. Longley, Council Offices, Moss Side, Manchester.
,,	1	Threlkeld—Room	—	J. Whiteley, Secretary, Threlkeld.
,,	1	Wilmslow, Cheshire—Police Station	—	H. Beswick, Newgate Street, Cheshire.
,,	2	Ecclesfield, near Sheffield—Caretaker's Cottage, &c.	Wortley Rural District Council	G. E. Beaumont, Workhouse, Grenoside, near Sheffield.
,,	2	Wilton, Wilts—Addition	Guardians	J. Harding and Son, 58 High Street, Salisbury.
,,	2	Worthley—Caretaker's Cottage	Rural District Council	G. E. Beaumont, Workhouse, Grenoside, near Sheffield.
,,	3	Brynmawr, Wales—Alterations, &c.	Llanelly School Board	J. Thomas, Clerk, Brynmawr, Breconshire.
,,	3	Cilfynydd, Wales—Alterations, &c.	Standing Joint Committee	Glamorgan County Offices, Westgate Street, Cardiff.
,,	3	Port Talbot and Pontypridd—Buildings	Glamorgan County Council	County Surveyor's Offices, Bridgend.
,,	3	Warrington—Wood Block Floors	Health Committee	T. Longdin, Town Hall, Warrington.
,,	4	Coleraine, Ireland—Extension, &c.	Urban District Council	Town Surveyor, Town Hall, Coleraine, Ireland.
,,	8	Brede, Sussex—Villa	—	T. Reid, Conster Manor House, Brede, Sussex.
,,	9	London, S.W.—Building Materials and Tools	Prison Board	Prison Commission Office, Home Office, Whitehall, S.W.
,,	9	Royston, Herts—Additions, &c., to Town Hall	Urban District Council	J. Smith, Hall keeper, Melbourn Street, Royston.
,,	10	Winwick, near Warrington—Farm Buildings, &c.	Lancashire Asylums Board	J. P. Muspratt, County Offices, Preston.
,,	10	Limerick—Alterations	Asylums Committee	Carroll and Batchelor, 86 Merrion Square, South Dublin.
,,	10	Sudbury, Suffolk—Police Station and Police Quarters	West Suffolk Standing Joint Committee	F. Whitmore, Architect, Chelmsford.
,,	11	Carlisle—Bridge Works, &c.	Committee	W. Hodgson, Local Surveyor, Keswick.
,,	11	Brighton—Villas	Freeholders of the Madeira Estate	Byfield and Son, 3 Stone Buildings, Lincoln's Inn, London.
,,	12	Ebbw Vale, Mon—Houses	Pretoria and Bloemfontein Building Clubs	J. P. Davies, Eureka Place, Ebbw Vale.
,,	15	Ynyshir, Wales—School Works	Ystradyfodwg School Board	J. Rees, Hillside Cottage, Pentre.
,,	16	Ballymacreely, Ireland—Villa	—	W. J. Fennell, Scottish Provident Buildings, Belfast.
,,	16	Evesham—Culverts	Rural District Council	E. Wadams, Union Offices, Evesham.
,,	16	London, N.—Renovation, &c.	—	Vicarage, St. John's Church, Highbury Vale.
,,	16	Llanbradach—Hotel	—	Teather and Wilson, Andrew's Buildings, Queen Street, Cardiff
		ENGINEERING.		
Mar.	29	Sunderland—Cables, &c.	Corporation	J. F. C. Snell, Dunning Street, Sunderland.
,,	29	Castlederg, Ireland—Water Pipe	Rural District Council	W. Hamilton, Clerk, Board Room, Workhouse, Castlederg.
,,	30	Blairgowrie, Scotland—Water Main	Water Committee	G. Cunnison, Burgh Surveyor, Blairgowrie.
,,	30	Caversham, Oxon—Water Mains	Urban District Council	S. P. Andrews, 22 Prospect Street, Caversham.
,,	30	East Retford—Gasholder	Gas Committee	J. B. Fenwick, Gas and Water Engineer, Retford.
,,	30	Evesham—Steam Roller	Town Council	Borough Surveyor, Town Hall, Evesham.
,,	30	Portinscale, near Keswick—Water Main	Cockermouth Rural District Council	J. B. Wilson, Court Buildings, Cockermouth.
,,	30	Wath-upon-Dearne, Yorks—Waterworks Extensions	Urban District Council	H. C. Poole, Council's Engineer, Town Hall, Wath-upon-Dearne.
,,	30	Penryn, Cornwall—Harbour Works	Harbour Authority	J. P. Jenkins, Town Hall, Penryn.
,,	30	Guildford—Bridge	Corporation	J. J. Webster, 39 Victoria Street, Westminster.
April	1	Amsterdam—Electrical Plant	Burgomaster en Wethouders	Director, Town Printing Works, Achterburgwal 213, Amsterdam.
,,	1	Armagh—Steam Roller	County Council	J. T. Hinton, Secretary, Armagh.
,,	1	Midhurst, Sussex—Cooking Range	Guardians	Workhouse, Midhurst
,,	1	Pen-y-Chwarel, Anglesea—Steel Loading Stage	—	Formans and McCall, 160 Hope Street, Glasgow.
,,	2	Barnsley—Pipelaying	Corporation	T. & C. Hawksley, 30 Great George Street, Westminster, S.W.
,,	2	Scarborough—Waterworks	Rural District Council	W. O. Woodall, 32 Queen Street, Scarborough.
,,	2	St. Albans—Bacterial Beds, &c	City Council	Beesley Son and Nichols, 11 Victoria Street, Westminster, S.W.
,,	3	Todmorden—River Diversion, &c.	Sanitary Committee	C. R. Pease, Engineer, Town Hall, Todmorden.
,,	3	Wrexham—Culvert	Rural District Council	R. Evans, Highways Surveyor, Johnstown, Ruabon.
,,	3	London, S.W.—Laying Pipe Sewer	Fulham Borough Council	C. Botterill, Surveyor, Town Hall, Walham Green, S.W.
,,	4	Easingwold, Yorks—Waterworks	Rural District Council	F. J. H. Robinson, Clerk, Easingwold.
,,	4	Fulham—Refuse Storage Platform	Council	F. H. Medhurst, Westminster Chambers, 13 Victoria Street, S.W.
,,	5	Pentybont, Wales—Waterworks	Rural District Council	J. Hurley and Son, 10 Bridgend Road, Aberkenfig.
,,	6	Christiania—Telegraph Wire, &c.	State Telegraph Department	Technical Department, Telegraph Office, Christiania.
,,	10	Barnstaple—Waterworks	Rural District Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster, S.W.
,,	10	Rosario—Harbour Works	Argentine Government	Commercial Department, Foreign Office, S.W
,,	11	London, N.—Plant	Hornsey Urban District Council	R. Hammond, 64 Victoria Street, Westminster, London, S.W.
,,	11	Lochearnhead, Scotland—Railway	Railway Company	Crouch and Hogg, 53 Bothwell Street, Glasgow.
,,	15	Kirkcaldy, Scotland—Plant	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
,,	15	Leeds—Pipes &c.	Lighting Committee	H. Dickinson, Whitehall Road, Leeds.
,,	15	Aberdeen—Fuel Economiser, &c.	Electric Lighting Committee	J. A. Bell, Cotton Street, Aberdeen.
,,	15	Wimbledon—Cable, &c.	Urban District Council	Electric Lighting Works, Durnsford Road, Wimbledon.
,,	15	Warrington—Pumping Plant	Corporation	J. Deas, Municipal Offices, Warrington.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

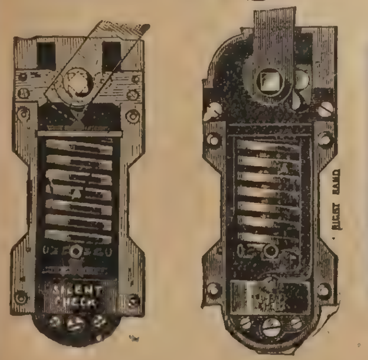
DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		IRON AND STEEL.		
Mar.	29	Hull—Steel Roofs for Destructor	Corporation	A. E. White, City Engineer, Town Hall, Hull.
„	30	Epsom—Sewerage Ironwork	Urban District Council	Surveyor, Bromley Hurst, Church Street, Epsom.
„	30	Norway—Rails, Steel Sleepers, &c.	—	Commercial Department of the Foreign Office, Norway.
„	30	Keighley—Sewer Pipes and Specials	—	W. H Hopkinson, Borough Engineer, Town Hall, Keighley.
„	30	Bradford—Castings, &c.	Corporation	Tramway Office, Forster Square, Bradford.
„	30	Willenhall, Staffs—Steel Picks, Shovels, &c.	Urban District Council	T. E. Fellows, Engineer and Surveyor, Town Hall, Willenhall.
April	1	Llanelly, Wales—Ironmongery, &c.	Urban District Council	Surveyor, Town Hall, Llanelly.
„	2	Leyton—Wrought-Iron Fencing	Urban District Council	W. Dawson, Surveyor, Town Hall, Leyton.
„	8	Pietermaritzburg, Natal—Water Pipes	Corporation	Ford Brothers, 12 Southampton Street, Fitzroy Square, London.
„	10	Christiania—Points	Norwegian State Railway Administration	Railway Director's Office, Christiania.
„	15	Birmingham—Pipes, &c.	Corporation	J. Mansergh, 5 Victoria Street, Westminster, London, S.W.
		PAINTING AND PLUMBING.		
Mar.	30	Annfield Plain, Durham—Colouring, &c.	Kyo School Board	G. T. Wilson, 121 Durham Road, Blackhill.
April	9	Royston, Herts—Painting, Decorating, &c., Town Hall	Urban District Council	J. Smith, Hallkeeper, Melbourn Street, Royston.
		ROADS AND CARTAGE.		
Mar.	29	Chatham—Materials	Admiralty	Superintending Civil Engineer, Chatham Dockyard.
„	29	Ramsey, Hunts.—Broken Granite	Urban District Council	F. R. Sergeant, Clerk, Ramsey, Hunts.
„	29	Aylesbury—Carting Granite	Highways Committee	R. J. Thomas, County Surveyor, County Hall, Aylesbury.
„	30	Heywood, Lancs—Setts, Kerbs, Macadam, &c.	Corporation	J. A. Settle, Borough Engineer, Heywood.
„	30	Chingford—Granite, &c.	Urban District Council	H Bird, 14 The Parade, Chingford.
„	30	Cockermouth—Repairs	Rural District Council	J. B Wilson, Court Buildings, Cockermouth.
„	30	Louth, Lincs—Granite	Town Council	G. H Allison Borough Surveyor, Town Hall, Louth.
„	30	Pocklington, Yorks—Stone	Rural District Council	T. Robson, Clerk, Pocklington.
„	30	Whitwood Mere—Improvements	Urban District Council	A. H. Hartley, Surveyor, County Chambers, Castleford.
„	30	Batley, Yorks—Materials	Town Council	O. J. Kirby, Borough Surveyor, Market Place, Batley.
„	30	Epsom—Setts, Kerbing, &c.	Urban District Council	Surveyor, Bromley Hurst, Church Street, Epsom
April	1	Hastings—Kerb	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
„	1	Rochford, Essex—Materials	Rural District Council	F. Gregson, Clerk, Southend-on-Sea.
„	1	Luton—Materials	Town Council	Borough Surveyor, Town Hall, Luton.
„	1	Moss Side, Lancs—Street Works	Urban District Council	H. B. Longley, Council Offices, Moss Side, Manchester.
„	1	Richmond Surrey—Road Works	Town Council	J. H. Brierley, Borough Surveyor, Town Hall, Richmond.
„	2	Wimbledon—Paths	—	W. C Poole, Prested Road, Clapham Junction.
„	3	Hollingbourn, Maidstone—Materials	Rural District Council	H. J. Bracher, 33 Earl Street, Maidstone.
„	3	Raunds, Northants—Materials	Urban District Council	T. Yorke, Engineer and Surveyor, Raunds.
„	6	Loughton, Essex—Granite	Urban District Council	J. H. Hayward, Council Offices, Loughton.
„	8	Warwick—Street	Town Council	E. M. Richards, 20 The Butts, Warwick.
„	8	Abergavenny—Limestone, &c.	Rural District Council	J. H. Farquhar, Clerk, Abergavenny.
„	9	Bromley, Kent—Materials	Urban District Council	Council's Offices, Bromley, Kent.
„	10	Tenterden—Quartzite	Town Council	W. L. C. Turner, Borough Surveyor, Town Hall, Tenterden.
„	15	Sutton Bridge, Lincs—Road Materials	Urban District Council	Surveyor to the Council, Sutton Bridge.
		SANITARY.		
Mar.	29	Lichfield—Sewerage Works	Urban District Council	H. Russell, 5 Market Street, Lichfield.
„	29	Southmead, near Bristol—Drainage Works	Guardians	— Cotterell, 28 Baldwin Street, Bristol.
„	30	Caversham, Oxon—Sewers, &c.	Urban District Council	S. P. Andrews, 22 Prospect Street, Caversham.
„	30	Droitwich—Sewers, &c.	Corporation	Borough Engineer and Surveyor's Office, Droitwich.
„	30	Preston—Reconstruction of Drainage System	Royal Infirmary	F. E. Dixon, 49 Lune Street, Preston.
„	30	Heywood, Lancs—Pipes	Corporation	J. A. Settle, Borough Engineer, Heywood.
„	30	Willenhall, Staffs—Pipes, Lime, &c.	Urban District Council	T. E. Fellows, Engineer and Surveyor, Town Hall, Willenhall.
April	1	London, N.W.—Scavenging	St. Pancras Borough Council	W. N. Blair, Borough Engineer, Town Hall, Pancras Road, N.W.
„	1	Basford, Notts—Sewers	Basford Rural District Council	S. Maylan, Public Offices, Basford.
„	2	Alvaston, near Derby—Sewers, &c.	Urban District Council	W. H. Radford, Albion Chambers, King Street, Nottingham.
„	2	Wimbledon—Sewers	—	W. C. Poole, Prested Road, Clapham Junction.
„	3	Newport, Salop—Sewers, Tanks, Filter Beds, &c.	Urban District Council	W. Wyatt, 99 Radford Road, Leamington.
„	6	Lossiemouth—Drainage Works	—	J. Wittet, 81 High Street, Elgin.
„	8	Burnley—Sewage Works	Corporation	Borough Surveyor, Burnley.
„	9	Woodford-cum-Membris, Northants—Sewage Works	Rural District Council	J. B. Williams, Moot Hall, Daventry.
		TIMBER.		
Mar.	29	Aylesbury—Timber	Highways Committee	R. J. Thomas, County Surveyor, County Hall, Aylesford.
April	1	Llanelly, Wales—Timber	Urban District Council	H. W. Spawart, Clerk, Town Hall, Llanelly.
„	10	Army Contracts, York—Wood	—	Assistant Adjutant-General, North-Eastern District, York.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
April	30	Keighley—Public Library	£50, £30, £20	W. H. Hopkinson, Borough Engineer, Town Hall, Keighley.
June	10	Ennis, co. Clare—Additions, &c., to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
No date		Darlington—Row of Shops and Dwelling Houses	—	Borough Surveyor, Town Hall, Darlington.

ROBERT ADAMS, 65 & 67 NEWINGTON CAUSEWAY, LONDON, S.E.
THE BEST TESTED BUILDING SPECIALITIES.
DOOR SPRINGS, FANLIGHT OPENERS, GEARING, WEATHER BARS, PANIC EGRESS BOLTS, METAL CASEMENTS AND SASHES, REVERSIBLE WINDOW FITTINGS, ETC. *60 Highest Awards in Competition.*

The "Victor" Double Action Spring Hinges.
THE BEST



The Best Overhead Pneumatic Silent Check Door Spring, the "Empress Victor."

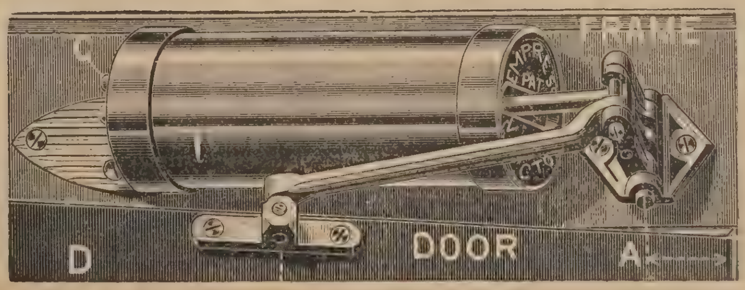
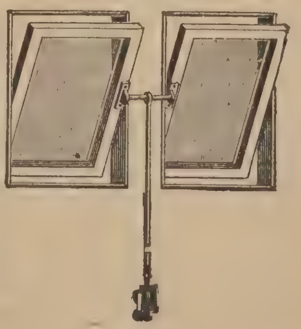


Fig. 1, as fixed on face of door.

Greatest Variety of Fanlight Openers and Gearing in the World.



CURRENT PRICES.

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	2	2	1	12	1
Colza Oil, English	do.	1	7	0		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	1			—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels	do.	1	4	6	1	4	9
Petroleum, American	per gal.	0	0	6⅝	0	0	7
Do. Russian	do.	0	0	6⅜	0	0	6¼
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	2	18	6		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	4	6	1	5	0
Tar, Stockholm	per barrel	1	8	0		—	
Turpentine	per cwt.	1	6	9	1	7	0

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	84	0	0		—	
Iron, Staffs., bar	do.	7	0	0	9	10	0
Do Galvanised Corrugated sheet	do.	11	0	0	11	5	0
Lead, pig, Spanish	do.	13	3	9	13	3	9
Do. do. English common brands	do.	13	15	0		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do., floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	15	0	7	0	0
Do. Mild Bars	do.	7	5	0	7	15	0
Tin, Foreign	do.	113	15	0	114	5	0
Do. English ingots	do.	118	0	0		—	
Zinc, sheets, Silesian	do.	20	10	0		—	
Do. do. Vieille Montaigne	do.	21	0	0		—	
Do Spelter	do.	16	0	0	16	15	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Do. Pitch	do.	2	11	0	2	15	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P. Std.	15	5	0	17	0	0
Do. do. 4th & 3rd	do.	11	15	0	13	5	0
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	15	0	15	5	0
Do. do. 2nd "	do.	8	15	0	14	15	0
Do. do. Unsorted "	do.	5	5	0	13	0	0
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	11	10	0	16	15	0
Do. White Sea	do.	12	0	0	13	15	0
Do. Quebec Pine, 1st	do.	22	0	0	23	0	0
Do. do. 2nd	per P. Std.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0	12	15	0
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	6	15	0	8	0	0
Flooring Boards, 1in. prepared, 1st	per square	0	12	0	0	13	0
Do. 2nd	do.	0	9	0		—	
Do. 3rd &c.	do.	0	8	6		—	

HARD WOODS

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba	per ft. sup.	0	0	4		—	
Do. Honduras	do.	0	0	3 25/32		—	
Do. Tobasco	do.	0	0	3¼		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	4⅜		—	
Do. African	do.	0	0	2 9/16		—	
Do. St. Domingo	do.	0	0	6⅜		—	
Do. Tobasco	do.	0	0	3 3/16	0	3	3 9/32
Do. Cuba	do.	0	0	5 1/16		—	
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks	do.	8	5	0	13	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American	per cub. ft.	0	3	1		—	

CONTRACTS OPEN.

HAMBLEDON RURAL DISTRICT COUNCIL.

TO SEWER CONTRACTORS.

The above-named Council invite TENDERS for (a) About one thousand lineal yards of 12in. OUTFALL SEWER, with Manholes and other incidentals; and (b) The CONSTRUCTION of SEWAGE PURIFICATION WORKS at Cranleigh, Surrey.

The plans can be seen on application to the Surveyor Mr. EDWARD L. LUNN, at his Offices, 36 High Street, Guildford.

Intending competitors are requested to send in their names to the said surveyor, and to deposit with him the sum of £3 3s., on or before WEDNESDAY, APRIL 3rd. now next ensuing. A copy of the specification, bills of quantities, and a form of Tender will then be sent to them.

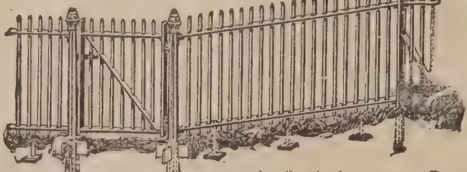
The deposit will be returned to all those who send in a bonâ-fide Tender, accompanied by the specification and schedule, unless the Tender be subsequently withdrawn, in which case the deposit shall be deemed to have been forfeited.

Sealed and endorsed Tenders in the form prescribed are to be sent in to me here not later than TWO o'clock p.m. on WEDNESDAY, APRIL 17th, 1901.

The Council do not bind themselves to accept the lowest or any Tender.

FERDINAND SMALLPLIN,
Clerk to the said Council,

No. 128 High Street, Guildford,
March 1901.



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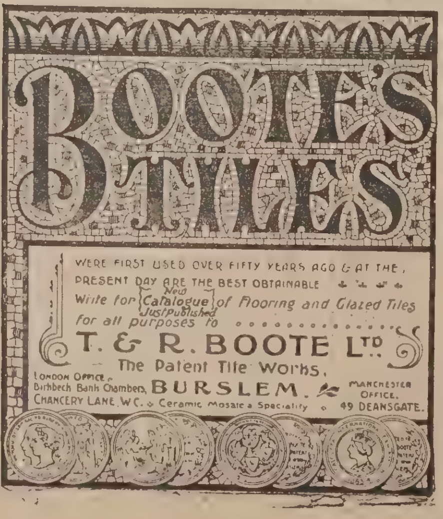

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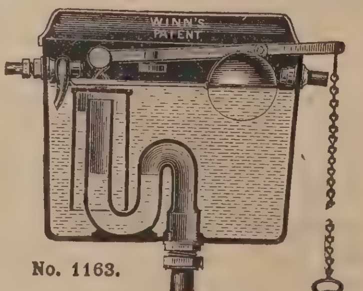

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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the Work.

ABERTRIDWR, near Caerphilly, Wales.—For the erection of an Independent chapel at Eglwysilan Road, Abertridwr, Caerphilly. Mr. Illtyd Thomas, P.A.S I., architect, 17 Quay Street, Cardiff:—

D. Gorman, Cardiff	£2,020 0 0
D. & M. Davies	1,990 0 0
J. P. Williams	1,925 0 0
J. Williams*	1,911 0 0
E. R. Evans & Bros., Cardiff	1,900 0 0
J. F. Evans, Cardiff	1,798 10 0
R. Jones	1,735 10 0

* Accepted. [Rest of Abertridwr.]

ASHFORD, Middlesex.—For the erection of a new Board school at Clarendon Road, for the Ashford School Board. Mr. Richard J. Lovell, architect, 46 Queen Victoria Street, London, E.C. Quantities by Messrs. Fleetwood, Son & Eversden:—

Foster Bros., Norwood	£7,852
Cooper & Son, Windsor	7,398
Butcher & Hendry, Windsor	7,363
G. Hill, London	7 264
S. Knight, Fulham	7,246
Roome & Co., London	7,200
Martin, Wells & Co., London	7,199
J. Appleby, London	7,177
A. & B. Hansom, Southall	7,067
J. Cracknell, Peterborough	7,034
R. & L. Tonge, Watford	7,000
Kingerlee & Sons, Oxford	6,987
Measom & Son, Twickenham	6,971
Drowley & Co., Woking	6,898
A. Emmett, Feltham	6,878
E. Chamberlain, Addlestone	6,825
W. Wisdom,* Isleworth	6,820

* Provisionally accepted.

AYR.—For extension of the electricity works:—

Excavator, brick, and mason.

J. & D. Meikle	£3,572 0 0
A. M'Lachlan & Son	3,270 0 0
A. Hunter	3,216 10 6
R. Stevenson	3,156 7 2
Greig Bros., Ardrossan	3,042 17 8
R. Hutchison	2,761 14 6
D. Kirkland	2,731 11 8
W. Watson	2,705 7 0

Carpenter, joiner, and ironmongery.

J. S. Stewart	1,317 14 9
J. Davidson	1,228 0 3
D. Kirkland	1,227 10 3
A. Brackenridge	1,218 17 1
J. M'Intyre	1,205 13 3
J. & D. Meikle	1,201 0 0
D. Milligan	1,200 16 6
D. & J. Milligan	1,180 8 0
A. M'Lachlan & Son	1,140 0 0

Slater and plumber.

J. Meikle	465 0 0
M'Ilwraith, Cowan & Co.	459 10 0
Drinnan & Murphy	445 15 0
A. Dalrymple	443 10 0
J. Mercer	442 7 7
W. Kennedy	440 2 0
W. Highet & Sons	434 10 0
W. Auld & Sons	402 0 0

Plaster and cement.

D. Bone, jun.	274 9 10
J. Leggat & Son	274 0 0
W. A Vass	249 16 4
W. Miller	249 8 4
D. & J. Bone	248 15 8

Painter.

W. Johnstone & Sons	130 18 1
J. M'Leod	124 14 6
J. B. Bennet & Sons	119 4 4
W. Willock & Son	105 4 9
W. Stewart	93 7 11
G D. Fraser	90 5 9

BLACKBURN.—For the erection of new central stores (five shops), for the Daisyfield Co-operative Society, Limited, Blackburn. Mr. John B. Thornley, architect, Darwen:—

W. H. Bury, White Ash Lane, Oswaldtwistle	£5,789 11 8
D. A. Ablett, Sovereign Road, Wigan	5,500 0 0
J. C. & F. Woods, Darbishire Street, Bolton	4,916 0 0
T. Harrison & Son, Birley Street	4,850 0 0
J. Knowles, Bolton Road, Darwen	4,690 0 0
R Shorrock, Union Street, Darwen	4,490 0 0
J. Parker, Peter Street	4,280 0 0
J. Sharples, 6 Shaw Street	4,263 0 0
J. Fecitt & Son, Weir Street	4,233 0 0
J. Boland, Wesley Street	4,200 0 0
Lloyd & Millward,* Blackburn Road, Darwen	4,200 0 0

Note.—These prices do not include ironwork or shop fittings, &c.

* Accepted. [Rest of Blackburn.]

BROMLEY, Kent.—For additions and alterations to private residence at Sundridge Park. Mr. St. Pierre Harris, architect, 8 Ironmonger Lane, E.C., and Orpington. Quantities by C. Stanger & Son:—

Graham & Co.	£1,681	D. Payne	£1,616
R. R. Lowe	1,638	Somerford & Son	1,610
Crossley & Son	1,630	T. D. Graty	1 526
F. P. Duthoit	1,618		

BRISTOL.—Accepted for the erection of new bar and smoke room at the Crown and Horseshoe Inn, Hanham, for the Bristol United Breweries, Limited. Mr. John Bevan, jun., architect, Liverpool Chambers, Corn Street, Bristol:—

E. Walters, Montpelier ... £930

CAMBORNE, Cornwall.—For the erection and completion of a proposed residence at Camborne Veor, Camborne, for Mr. J. M. Holman. Mr. Sampson Hill, architect, Green Lane, Redruth:—

House.

T. Glasson, Carbis Bay	£3,660
J. Colliver, Truro	3,640
W. J. Winn, Helston	3,547
Hodge & Mitchell, Redruth	2,922
J. Odgers, Redruth	2,812

Oak joinery.

J. Colliver	£815
W. J. Winn	673
Hodge & Mitchell	640
J. Odgers*	554
T. Glasson	520

Whole tender.

Turner & Trounson, Camborne ... 4,440

* Accepted.

DONEGAL.—Accepted for renovating licensed premises at Donegal, for Mr. M. Flood, Londonderry. Mr. Jas McGrath, C.E., architect, 28 Carlisle Road, Londonderry:—

Dan Gillespie, Londonderry ... £160

ERITH, Kent.—For the erection of 48 cottages and superintendent's lodge, for the Erith Urban District Council:—

Cottages.

W. Coker, Halling, Rochester	£18,188 15 0
G. G. Page, 19 Lyndon Road, Belvedere	12,010 0 0
H. J. Evans, 12 Bexley Road	11,822 0 0
G. H. Gunning & Sons,* 30 Crayford Rd.	11,781 0 0

Lodge.

W. Coker	475 0 0
G. H. Gunning & Sons	420 0 0
H. J Evans	410 0 0
G. Wyman, Hillside, Kentish Road, Belvedere	398 15 0
F. Spencer & Son, Riverdale Road	394 10 0
G. G. Page	392 0 0
J. T. Jarvis,* 16 Pier Road	380 0 0

* Accepted. [Rest of Erith.]

HULL.—For the erection of schools, Thoresby Street, for the School Board. Messrs. Brodrick, Lowther & Walker, architects, Lowgate, Hull:—

D. Robinson	£16,457 18 0	T. Levitt	£15,495 0 0
G. Houlton	16,400 0 0	G. L. Scott	15,000 0 0
Bowman & Son	16,394 0 0	Simpson & Son	14,776 0 0
M. Harpur	16,296 0 0	F. Beilby,* St. George's Road, Hull	14,686 0 0
F. Southern	16,167 8 4		
T. Groates	15,550 0 0		

* Accepted.

LONDON, S.E.—For decoration and general repairs to Lewisham High Road Congregational Church and Schools. Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, architects, 5 Clement's Inn, Strand, W.C.:—

Godfrey, Giles & Co	£1,121 15 6	Robert Zoper	£799 15 0
Battley, Sons & Holmes	845 0 0	Collingwood & Co.*	569 13 0

* Accepted.

LONDON, N.—For the erection of Muswell Hill Baptist Church and Schools. Messrs George Baines, F.R.I.B.A., and Reginald Palmer Baines, architects, 5 Clement's Inn, Strand, W.C.:—

Church. Estimate A.

G. Smith & Son	£7,853 10 0	Battley, Sons & Holmes	£5,617 0 0
G. Chessum & Son	5,969 0 0	F. J. Coxhead	5,487 3 7
Holliday & Greenwood	5,949 0 0	McCormick & Son	5,420 0 0
V. Goad	5,872 0 0	Jno. Richardson	5,185 0 0
Gregar & Son	5,827 0 0	Mattock Bros.	5,081 0 0

Upper part of tower. Estimate B.

G. Smith & Son	568 0 0	Holliday & Greenwood	463 0 0
Gregar & Son	535 0 0	Mattock Bros.	461 4 0
V. Goad	529 0 0	F. J. Coxhead	456 19 11
Battley, Sons & Holmes	508 0 0	McCormick & Son	426 0 0
G. Chessum & Son	497 0 0	Jno. Richardson	387 0 0

Gallery and approaches. Estimate C.

G. Smith & Son	707 0 0	Mattock Bros.	488 7 0
Gregar & Son	563 0 0	McCormick & Son	485 0 0
V. Goad	555 0 0	Holliday & Greenwood	479 0 0
Battley, Sons & Holmes	548 0 0	Jno. Richardson	445 9 0
F. J. Coxhead	490 1 4		
G. Chessum & Son	489 0 0		

Boundary walls, fences and gates. Estimate D.

G. Smith & Son	864 0 0	Battley, Sons & Holmes	332 0 0
Holliday & Greenwood	357 0 0	Jno. Richardson	327 0 0
V. Goad	350 0 0	Mattock Bros.	293 10 0
Gregar & Son	347 0 0	G. Chessum & Son	279 0 0
F. J. Coxhead	346 8 4	McCormick & Son	266 0 0

Sawn boarding on roof. Estimate E.

V. Goad	57 0 0	G. Chessum & Son	51 17 0
Gregar & Son	55 0 0	McCormick & Son	45 0 0
Mattock Bros.	53 6 0	Holliday & Greenwood	44 0 0
Jno. Richardson	53 0 0	F. J. Coxhead	48 6 0
Battley, Sons & Holmes	53 0 0	G. Smith & Son	34 0 0

Total.

G. Smith & Son	9,521 0 0	Battley, Sons & Holmes	7,053 0 0
V. Goad	7,360 0 0	F. J Coxhead	6,773 19 2
Gregar & Son	7,327 0 0	McCormick & Son	6,642 0 0
Holliday & Greenwood	7,292 0 0	Jno. Richardson	6,398 0 0
Chessum & Son	7,285 17 10	Mattock Bros.*	6,367 7 0

* Accepted. [Architect's estimate, £6,740.]

NEWPORT.—For concrete and brickwork covered service reservoir, for the Newport (Isle of Wight) Corporation. Mr. Edwd. T. Hildred, engineer, 1 High Street, Gosport:—

Wills & Sons	£7,475 0 0	R. M. Parkinson	£4,785 0 0
S Kavanagh	5,040 14 6	Stevens & Co.,* Southampton	4,624 0 0
Cooke & Son	4,859 0 0		
Patrick & Co.	4,799 0 0		

* Accepted.

YEOVIL.—For the construction of septic tanks, filters, and appurtenant works within the borough, for the Corporation. Mr. W. K. L. Armitage, borough surveyor:—

A. Wills & Son, Bath	£24,160 14 4
S. Ambrose, Bath	22,513 4 10
Hawking & Best, Teignmouth	21,639 10 0
B. Cooke & Co., Westminster	16,571 0 0
G. Bell, Tottenham	16,397 0 0
S. Saunders, London, S.W.	15,630 0 0
H. W. Pollard, Bridgwater	14,883 0 0
Stephens & Sons, Exeter	14,324 16 2
Bird & Pippard,* Yeovil	14,180 0 0
J. W. & H. Childs, Yeovil	13,843 15 0

* Accepted.

WOOLWICH.—For the erection of superintendent's house and stores central laundry, and workshop upon site abutting upon Lodge Lane and Bostall Heath, Plumstead, for the Guardians of Woolwich Union. Messrs. Church, Quick & Whincop, architects, William Street, Woolwich:—

E. Proctor, Woolwich	£14,270
Foster Bros., Norwood Junction	14,225
Martin, Wells & Co., Aldershot	14,165
H. L. Holloway, Deptford	14,085
Thomas & Edge,* Woolwich	13,997

* Accepted.

COMING EVENTS.

Wednesday, March 27.

SOCIETY OF ARTS.—Mr. A. A. Johnston on "Clocks, Carillons and Bells," 8 p.m.

BUILDERS' FOREMEN AND CLERKS' OF WORKS INSTITUTION.—Quarterly Meeting of Directors at 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS (Birmingham Local Section).—Mr. W. Wyld on "Polyphase Equipment in Factories," 7.30 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the Ilford Sewerage Works and Sewage Disposal by Bacteriological Methods, 1.30 p m.

CITY OF LONDON COLLEGE SCIENCE SOCIETY.—Mr. A. T. Walmisley, M.I.C.E., on "Building Stones," 7.30 p.m

EDINBURGH ARCHITECTURAL SOCIETY.—Mr. W. Scott Morton on "Aids and Hindrances to Design."

SANITARY INSTITUTE.—Lectures and Demonstrations, for Sanitary Officers, Part I—Inspection and Demonstration at the East London Water Works, Lea Bridge, Clapton, at 3 p.m., conducted by Mr. W. B. Bryan M.I.C.E.

Thursday, March 28.

GLASGOW INSTITUTE OF ARCHITECTS. — General Meeting at 2 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part I.—Professor Henry Robinson, M I.C.E., on "Scavenging, Disposal of House Refuse," 7 p.m.

ROYAL INSTITUTION.—Sir Wyke Bayliss on "Shakespeare in Relation to his Contemporaries in Art."—II., 3 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—First Conversazione at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly.

INSTITUTION OF ELECTRICAL ENGINEERS.—Mr H. W. Ravenshaw on "The Electrical Transmission of Power in Coal Mines," and Mr. S. F. Walker on "Portable Electric Lamps." 8 p.m.

Friday, March 29.

ARCHITECTURAL ASSOCIATION.—Mr. H. D. Searles-Wood and Mr. H. R. Appelbee on "Small Suburban Houses," 7.30 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers. Part II—Mr. W. Hunting, F.R C V.S., on "Signs of Health and Disease in Animals Destined for Food," 7 p m.

ROYAL INSTITUTION.—Lord Rayleigh on "Polish," 9 p.m.

Saturday, March 30.

ARCHITECTURAL ASSOCIATION.—Fourth Spring Visit to the new Prudential Assurance Company's buildings in Holborn, W.C. (Messrs. Alfred Waterhouse, R.A., and Son, architects), at 2.30 p m.

SANITARY INSTITUTE.—Inspection and Demonstration at the Sewage Outfall Works, Barking, at 3 p.m., conducted by Mr. John E Worth, M.I.C.E

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS, Newcastle-upon-Tyne.—Council Meeting at 1.30 p.m.

Monday, April 1.

ROYAL INSTITUTE OF BRITISH ARCHITECTS. — To consider Amendments to the Institute Form of Conditions of Contract.

ROYAL INSTITUTION.—General Monthly Meeting at 5 p.m.

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part II. — Mr W. Hunting, F R.C.V.S., on "The Names and Situations of the Organs of the Body in Animals," 7 p.m.

SOCIETY OF ENGINEERS.—Ordinary Meeting at 7.30 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY. — Mr. A. N. Paterson, M.A., on "Tradition, Archæology and Art."

Tuesday, April 2.

GLASGOW ARCHITECTURAL ASSOCIATION. — Mr. Stephen Adam on "Colour in Decoration."

CARDIFF, SOUTH WALES AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—Meeting.

Wednesday, April 3.

RUSKIN SOCIETY of BIRMINGHAM.—Annual meeting at 8 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

GEOLOGICAL SOCIETY OF LONDON. — Meeting at 8 p.m

SANITARY INSTITUTE.—Lectures and Demonstrations for Sanitary Officers, Part II — Mr. W. Hunting, F.R.C.V.S., on "Practical Methods of Stalling and Slaughtering Animals."

Workmen's Houses at Wellington. — Mr. Fleming, architect, of Wolverhampton, has prepared plans for workmen's dwellings which have been adopted by the Wellington Urban District Council, which proposes to apply to the Local Government Board for permission to borrow £4,200 to buy land and erect the first lot of houses.

Coal Smoke Abatement Society. — In the annual report for the year ended December 31st, 1900, attention is drawn to the fact that since the formation of this society in March, 1899, no fewer than 2,700 observations have been made by the society's inspector on smokey chimneys in various parts of London; offences have been proved in 162 cases, and penalties have been inflicted, amounting altogether to the large sum of £750, of which many have been of small amount. A larger income is urgently needed to carry on and extend the scope of the society's work. Subscriptions should be sent to the hon. treasurer, Dr. Des Voeux, 14 Buckingham Gate, S.W., and any further information required will be given on application to the secretary, at the offices of the society, 59 Chancery Lane, W.C. The committee have written to the various borough councils of London, suggesting that, wherever occasion arises, the councils should specify for some form of the grates and stoves already in the market designed materially to reduce the evil of imperfect combustion being used in buildings under their control. The society have made a similar suggestion to her late Majesty's Government and to the London School Board, which has been received by them with a promise to put it in operation without delay, and whenever possible, and even to furnish facilities for trials in order to ascertain the best form of smokeless grate for the purpose.

THE BVILDERS' JOVRNAL & ARCHITECTVRAL RECORD

April 3, 1901.
No. CCCXXI.

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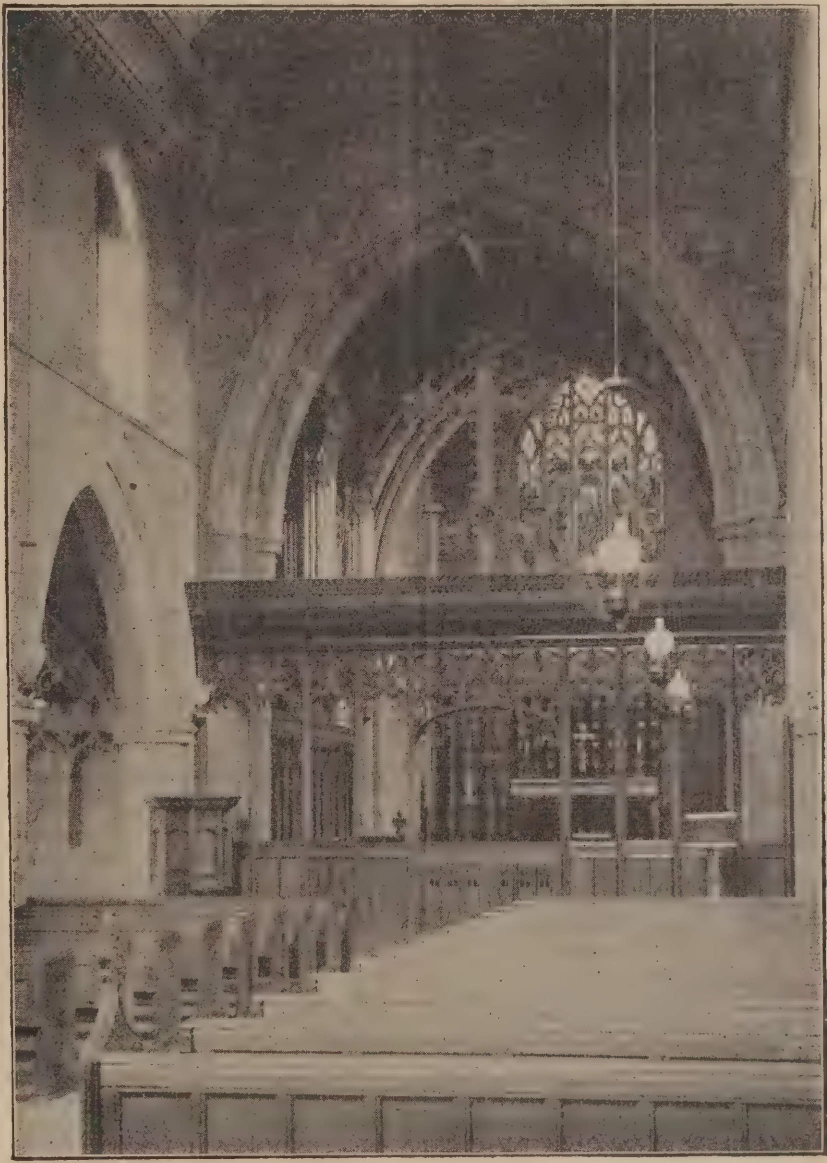
An Architectural Causerie.

The Victoria Memorial. THE statement has been circulated in the daily press that Mr. T. G. Jackson, Mr. Aston Webb, Mr. Ernest George, Sir Thomas Drew and Dr. Rowand Anderson have been invited to submit designs for the Queen Victoria Memorial, and that these designs are to be in the Office of Works by the end of June. If true, we much regret this decision. We have already expressed the opinion that this memorial should be the subject of an imperial competition among British architects: to restrict it to five men, who, though giants professionally, do not represent the sum-total of our architecture, is both unfair and impolitic. In cases where planning or some special requirements are all important, it is often desirable to invite designs from a few men who are professedly specialists in these particular branches, but with this memorial no such conditions obtain. Planning will be practically non-existent: the memorial will be, as Mr. Balfour remarked, an artistic and not a utilitarian structure. We therefore consider it a great mistake to exclude the profession by only selecting five of its members, prominent though they be; and we hope that sufficient protest will be lodged against this proposal to negative it.

St. Mary's Church, Stretton, near Burton-on-Trent. THIS church was begun in 1895 and consecrated in November, 1897. It takes the place of a very inferior church built about sixty years ago. The new church was the gift of the late Mr. John Gretton to his native village. It consists of a nave with aisles, a chancel with a chapel on the south and a transept containing the organ on the north, with a central tower. The building is all of ashlar, the inside being of red Runcorn stone and the outside hard sandstone from Stanton, near Ashbourne. The church was consecrated with all its furniture and decorations complete, except the painted glass in the two side windows of the sanctuary, which was put in a few months later. In the opinion of the architects (Messrs. J. T. Micklethwaite and Somers Clarke) these windows and the east window are all that require painted glass; but the chapel is being treated separately, and is now having its windows filled in memory of the founder. The church is seated for 280 persons and cost rather more than £30,000. Our illustration is from a photograph taken by Mr. W. Weir, who was clerk of works at the completion of the building.



STRETTON CHURCH, STAFFORDSHIRE. J. T. MICKLETHWAITE AND SOMERS CLARKE, ARCHITECTS.

The Level of London. A STATESMAN addressing the House of Commons once spoke of "levelling up" the conflicting Churches of Ireland. The phrase became popular like many more because it gave expression to an idea for the first time in words. Levelling is usually associated with bringing down, but here it means raising up to one standard. A process of levelling up has been going on for ages in great cities. Rome is a case in point. Originally built by a band of fugitives or outlaws, the site in the first instance was dictated merely by considerations of safety. The great plain of the Campagna is considerably above the coast level; at a point where it breaks abruptly down into a lower plain, extending a few miles farther to the sea, they built their settlement, possibly, it is thought, amongst the ruins of an older city, for recent discoveries have revealed Cyclopean masonry far below the supposed foundations of the town, and evidently the work of an earlier race. Gradually the level of the city rose. The Empire came and went; the Middle Age succeeded, and the remains of Roman palaces and baths were used as foundations for new buildings, a quantity of valuable material being crushed into an indistinguishable mass. Neglect and the shrinking of the population led to the partial covering of many structures by the soil, until in our own day the traveller who visits "the ruins of ancient Rome" finds, after driving through the modern city, that he looks *down* upon them. The rule applies to all great cities. London was originally a little Celtic settlement upon Ludgate Hill, which rose over a vast marsh; hence its name Lun Dyn—the lake fort. The inequalities of London's surface lasted long: it is only a few years ago that the construction of the Holborn Viaduct opened a level road from the West End to the City; and many men remember the descent of "Holborn Hill" and the climb up "Snow Hill," the numerous accidents in bad weather, and the scene when the ground was slippery with frost, and horses, men and omnibuses went down. In the City the results of "levelling up" are greater convenience and more orderly and straighter streets, but a loss of picturesque effect which can only be appreciated by consulting old prints and drawings of London. After the Great Fire in 1666, when Wren began to rebuild the Cathedral and many churches and other buildings, the town was still a smouldering mass of charred ruins. Drawings of the last century show us his London rising steeply from the water to the hills behind; London Bridge, the successor of the old wooden structure, but much lower than the existing one; whilst his towers, cupolas and steeples stand sharply out, high above the mass of the town. Now all is changed. Immense structures, great railway stations, towering warehouses and blocks of offices have reduced the apparent height of his towers. Standing near the Fishmongers' Hall we look *down* over the parapet upon the entrance to Wren's church of St. Magnus; yet it was past its doors that the stream of traffic then ran to the older bridge. London has risen many feet since then.

MEN WHO BUILD.

No. 63.—E. GUY DAWBER.

TIMES of transition are always times of anxiety. English architecture is in a transition state to-day, and it therefore behoves all who are responsible for it to see that they do not play false to their trust. We are emerging from the shadow of dead mediocrity into the fuller light of fresh and sane design, but amidst this transit one hears the conflicting cries of many self-styled leaders, each clamouring for a band to guide into the land of milk and honey. That this land of milk and honey should seem to lie in so many places at once is no surprise, considering the circumstances; yet it should be the duty of everyone to see that he is not blindly following a crowd, but cognisant of his whereabouts and honestly endeavouring to make the best of the position in which he finds himself.

In the olden days the buildings, furniture and decoration possessed a charm which the generality of modern work lacks—a charm which we designate with that ill-definable word "beautiful."

Those days, however, had their own conditions, which are not ours, and it is a foolish affectation to mimic them. What, for example, more unwarrantable than to duplicate old oaken chairs, biting the surface of the wood by means of ammonical fumes in order to forge the wear of Time: or perhaps employing a shot-gun for the purpose of producing worm holes? We might just as well take a hose-pipe and some acid water and play upon our houses in order that sharp angles might be rounded and straight lines broken. But while such duplication of ancient work is indefensible there is every reason to apply to our present creations so much of the principles and methods which made the old work beautiful; and in nothing is this more proper than when concerned with the planning, design and decoration of country houses.

As such a designer, Mr. E. Guy Dawber is most happy in his results, as some of his work which we illustrate will serve to show.

His houses have a quiet simplicity about them which is a great relief from the fussy, restless erections to which, alas! we are so accustomed. Without belonging to that extreme school which thinks of the Middle Ages as a kind of artistic millennium, and goes into preconceived raptures over everything which is not modern, one can appreciate those old panelled rooms, those delightful windows which peer out in unexpected places, and those cosy nooks where one may sit secluded, and it is the spirit which produced them that one desires to see embodied in the houses of our own times. Mr. Dawber's designs show how successfully this can be done: for whilst eschewing all slavish reproduction of old models, he yet endeavours by simple and straightforward means to obtain much of the pleasing and homely effect so noticeable in the work of bygone days. Mr. Dawber is also one of those who believe that the planning of the garden and of the house should as far as possible be done by the same hand, though he holds that the architect should not meander off into by-paths not properly within his sphere.

With this preface of the general tenor of his work we may now give some particulars of his career.

Mr. Dawber was born at King's Lynn, in Norfolk, and served his articles in the same town. It was here, amongst its wealth of domestic and ecclesiastical architecture, that he became imbued with that love of sketching and studying old work which has never ceased to interest him. Upon the expiration of his articles, in 1881, he entered the office of the late Sir Thomas Newenham Deane in Dublin, and after a year in that city (during the troublous times of the Land League and the consequent stagnation of almost every business) came to London and into the office of Messrs. Ernest George and Peto.

Entering the Royal Academy Schools in 1883, he gained the Lower School Premium in 1884 and the Upper School Premium in 1885, competing the same year for the Gold Medal.

Incessant work during the day time and in the evenings telling upon his eyes, he in 1886 acted as clerk of works for Messrs. Ernest George and Peto on a house in Cadogan Square, and in 1887 went in the same capacity to supervise for them the building of Batsford, in Gloucestershire, until 1890, when he commenced to practise on his own account in the little village of Bourton-on-the-Hill. It was during the years Mr. Dawber was in Gloucestershire that he studied and sketched in almost every village in the Cotswolds within reach and so gained the intimate knowledge of this most interesting district which he now possesses.

His work commenced with the remodelling and extensive alteration of a large mansion, which led rapidly to other works of a similar kind, until now there are many houses in the neighbourhood that bear the impress of his handiwork.

In 1891 he came to London again and continued his practice at 22 Buckingham Street, Adelphi, W.C., where he has been ever since. In 1897, Mr. F. A. Whitwell joined him in a partnership, which terminated in June last year. At the present time he is doing work (and has done so for some time past) in nearly a dozen counties in different parts of England, besides much in London and neighbourhood.

The following are some particulars of the accompanying illustrations, which include the chief work which Mr. Dawber has carried out:—

St. John's Chapel, Matlock.—Built on the slope of the hill, high above the valley, with a stream running through the rock below it. The idea of water has been symbolised throughout the decoration. The coloured east window is by Mr. Louis Davis, the figures around the pulpit by Mr. Cecil Fabian, the plaster ceiling by Mr. George Bankart, the decorations and painted altar-piece by Mr. John Cooke. The interior decorations are not yet complete. Care was taken in designing this delightful little chapel to make it appear to grow naturally out of the wall below and to get the effect of clinging to the side of the hill. The result was most successful.

The Court House, Broadway, Worcestershire.—This, which is practically a new house—a fragment of an old gateway only remaining—was built of stonework and slating from old barns and buildings taken down. It is in the quiet Cotswold manner and contains plaster ceilings by Mr. George Bankart and panelled halls and stairs, &c.

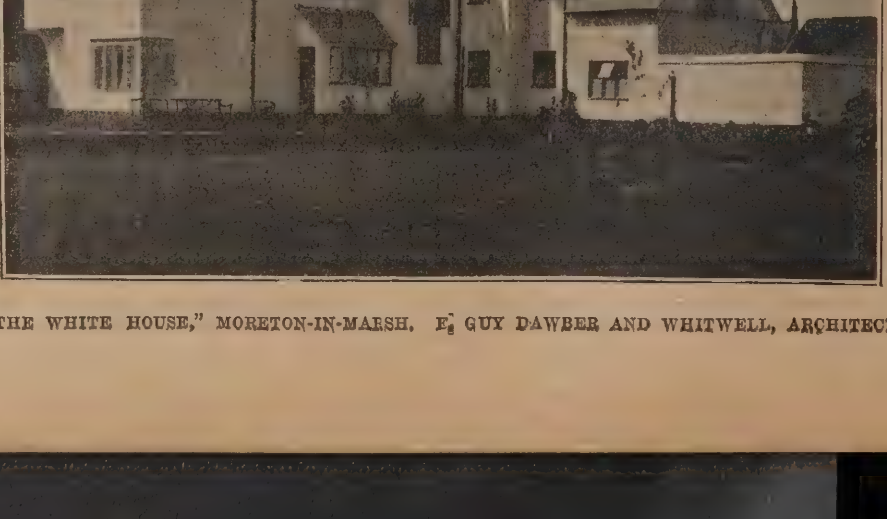
The Post Office, Broadway, Worcestershire.—In the main street, and an endeavour to treat this class of building, generally so conventional and official in aspect, in sympathy with its surroundings. A feature is made of the bay window, which is carried up two storeys. Mr. Dawber has also done much other work in this village.

House at Cley, Norfolk.—This house is built of flint and brick in the local manner, with mullioned windows and leaded panes, and stands on the slope of a hill overlooking the wide valley of the Glave; opposite are Blakeney and Glandford Churches, and away on the right, over the quaint old-world village of Cley, is the sea. The dining-room here is panelled from floor to ceiling with fine oak, saved many years ago from an old house in the village which fell into ruins. The roof is covered with red pantiles, and the house is surrounded by a garden with terraces and sunk lawns, following the slope of the hill ground.

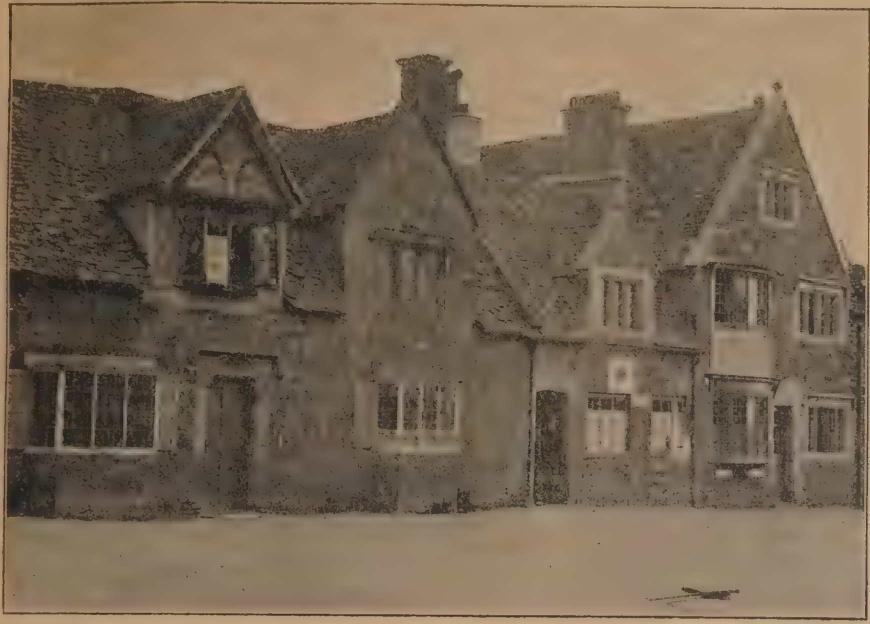
The White House, Moreton-in-Marsh, Gloucestershire.—This little house, built a few years ago for a doctor, is in brick rough-casted, with a high tarred base and a roof of Cotswold stone slates. It is quiet and unobtrusive, and with the stables and outbuildings adjoining forms a cheery group at the entrance to the town. It is close to the railway station, and the gardens, laid out and planned by the architect, are enclosed by a high wall.

Village Schools, Stow-on-the-Wold, Gloucestershire.—These, again, are built in the local manner, with stone walling, stone-slate roof, mullioned windows and lead lights.

Donnington Hurst, Newbury, is picturesquely situated on a site of about fifteen acres, between two woods, the entrance-drive being taken through the one behind the house. The site sloped very much, so that



"THE WHITE HOUSE," MORETON-IN-MARSH. E. GUY DAWBER AND WHITWELL, ARCHITECTS.



THE POST-OFFICE, BROADWAY, WORCESTERSHIRE. E. GUY DAWBER, ARCHITECT.

considerable making-up of terraces and lawns was needed. All the gardens, terraces, lawns, pergolas, steps, &c., were designed by Mr. Dawber, and the house itself is very pleasing. It is quiet and simple. There is no striving for ornamentation or ostenatious display, and the effect is reposeful. The walls are partly of brick and partly rough-casted, and the roofs are tiled, with the chimneys in thin red facing-bricks. The windows are mullioned and have lead lights. The whole of the ceilings to the ground floor are treated with modelled plaster by Mr. Bankart, and the continous treatment—no one room being more ornate than another—is very charming. The hall is panelled, opening with folding doors into the parlour, giving a very pleasing vista with the garden beyond, and with its wide stone fireplace carried up to the ceiling is very effective. The window-curtains, &c., all tone in with the scheme, and were obtained from Germany, being simply the delightful red and white, and blue and white checks one sees used so successfully in cottages and houses abroad. All the walls throughout are kept white. Here is a house where, with simple everyday materials and a comparatively small outlay, a good effect has been gained. The only features, so to speak, are in the planning and detail of the building itself and in its ceilings, &c. It is about two or three miles out of Newbury, and forms one of a series of houses which Mr. Dawber is now building in various parts of England.

One of the chief specialities of Mr. Dawber's work consists in altering and adding to large country houses, in numerous instances entailing practically the entire remodelling—a species of work that is very interesting, though somewhat unsatisfactory. But whilst the architect is more or less fettered on the outside, he has free scope for his powers with the interior, and Mr. Dawber has not hesitaied to avail himself of his opportunities.

"*Hartpury*," *Gloucestershire*, is full of rich work and decoration. The ceilings throughout were executed by Mr. Bankart, and oak is freely used for panelling in all the chief rooms. The business room is panelled in cedar, from trees cut some years ago on the estate. The drawing-room, with its barrelled plaster ceiling, white panelling and silk hangings, mahogany doors and polished floor, is a very fine room; the candelabra, designed by Mr. Dawber, were made by Mr. Shirley, of Rathbone Place. The brass masks in the billiard-room chimney-piece were modelled and cast by Mr. Stirling Lee, the culptor. The work was commenced about seven years ago and is still going on, the ining-room having had a very rich ceiling, by Mr. Bankart, put in only last year, when the himney-piece and panelling were also fixed in the same room; the former, about 11ft. wide and 9ft. high, is a very rich piece of work, with a portrait in the centre over the fireplace.

Itton Court, Monmouthshire.—Another large house altered and added to by Mr. Dawber about eight years ago, when at the same time stables, lodges, &c., were built. The gardens, terraces, pergolas, &c., are now being carried out under the architect's superintendence, and cottages, &c., are being erected.

Amongst other houses which Mr. Dawber has remodelled and added to may be mentioned the following:—

Springhill Mansion, Worcestershire; Beachley Lodge and *Ebrington Hall*, both in *Gloucestershire; Norton Hall, Gloucestershire; Barton House, Warwickshire; The Manor House, Bourton-on-the-Water, Gloucestershire; Broadwell Manor, Gloucestershire; Lemington Manor, Gloucestershire; Middle Hill, Worcestershire; Todenham House, Gloucestershire; Austin House, Worcestershire; Bowood, Wiltshire; Chadshunt, Warwickshire;* and many others too numerous to mention, besides much miscellaneous work in different parts of the country.

Cottages, Matlock Dale.—These three cottages, built a few years ago, overlook the lovely valley of the Derwent. They are in stone and rough-cast but call for no particular comment, except that as an investment they pay over 6 per cent interest on the outlay.

Mr. Dawber is an enthusiastic sketcher in water-colours (we reproduce three of his sketches) and a keen collector and connoisseur of old furniture, chiefly examples of eighteenth-century English work—he has written much on the subject in "Architecture," the "Architectural Review" and various papers, but at the same time has a very great admiration for some of the really good simply-designed modern work.

Mr. Dawber is deeply interested in the "cottage problem" now attracting so much attention, and has built many in different parts of the country, but he feels that if good, simple building is to be done in country districts many of the present restrictive building by-laws will need to be abolished, and in this connection it may be mentioned that he was one of the deputation recently appointed by the Royal Institute of British Architects to wait on Mr. Grant Lawson, parliamentary secretary to the Local Government Board, with a view to securing some revision of the existing by-laws.

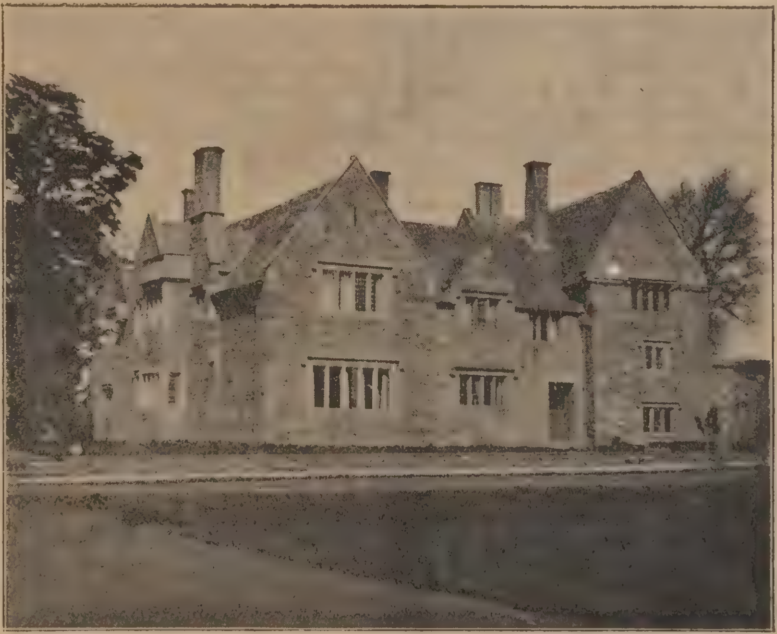
In the design of houses Mr. Dawber has shown what successful results are obtainable in skilled hands, and it is much to be desired that houses of similar merit were more common. When they are the status of our architecture will have improved considerably, and the men who now fill our suburbs with so many "desirable villas" will fast be losing their power.

ARCHITECTURAL ASSOCIATION.

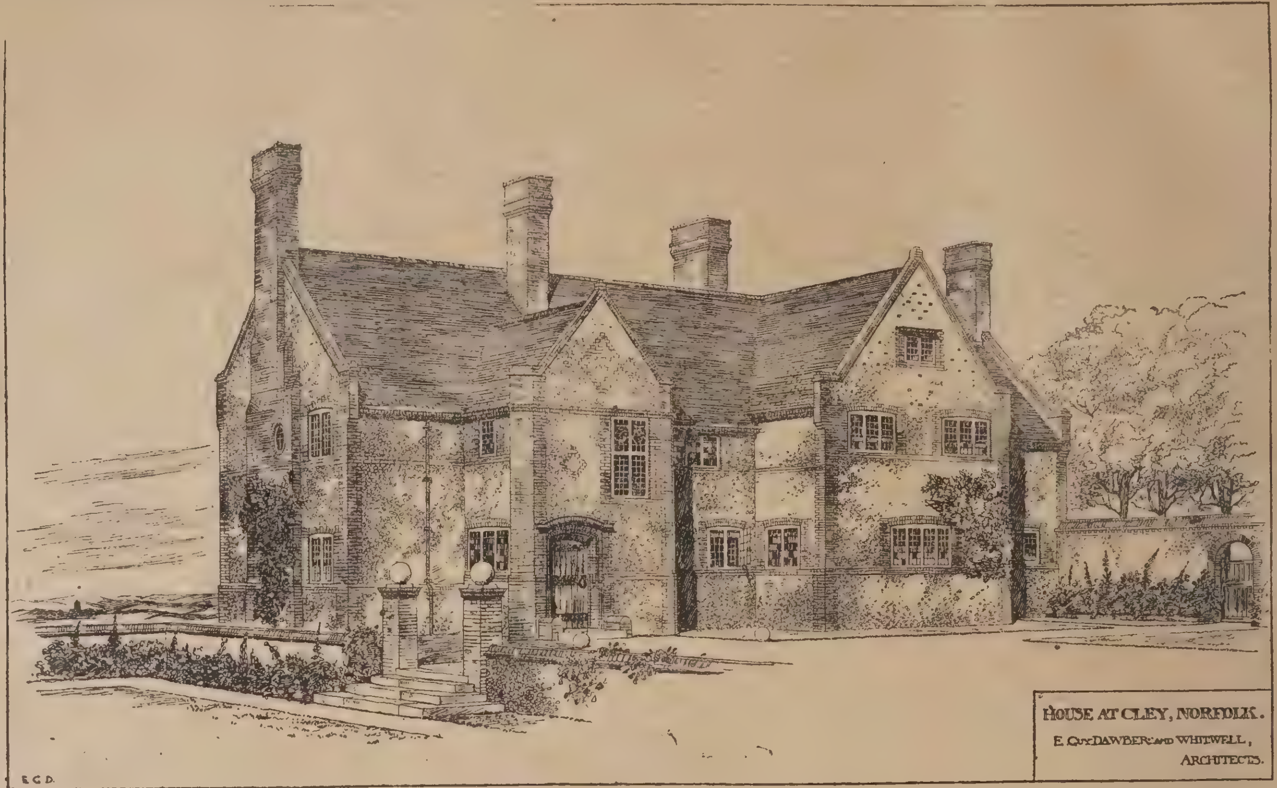
SMALL SUBURBAN HOUSES.

By H. D. SEARLES WOOD and H. R. APPELBEE.

A MEETING of the Association took place last Friday evening, when Mr. Henry T. Hare, F.R.I.B.A., was in the chair. Messrs. W. Boyd, E. R. Sladen, H. Lawrence and H. Prince having been elected members of the Association, the following preliminary House List was read, it being open till the next meeting for other names to be nominated:—*President*, Mr. W. Howard Seth-Smith; *Vice-Presidents*, Messrs. G. B. Carvill and E. Guy Dawber; *Committee*, Messrs. H. R. Appelbee, C. H. F. Comyn, A. C. Dickie, R. H. Weymouth, F. D. Clapham, W. H. Raffles, W. A. Pite, A. H..



THE COURT HOUSE, BROADWAY, WORCESTERSHIRE. E. GUY DAWBER AND WHITWELL, ARCHITECTS.



HOUSE AT CLEY, NORFOLK.
E. GUY DAWBER AND WHITWELL,
ARCHITECTS.

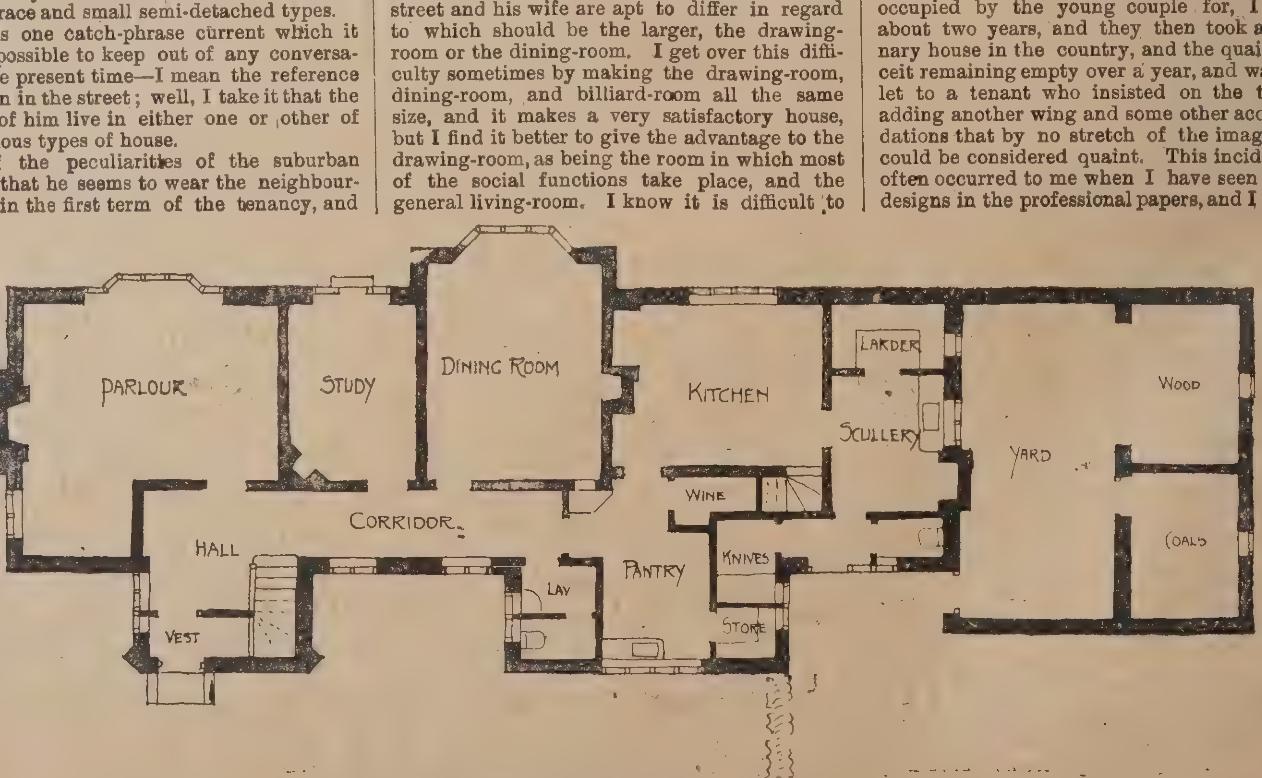
Goslett, W. J. Tapper, Hon. A. McGarel Hogg, L. Ambler, A. T. Bolton, W. A. Forsyth, H. T. Hare, Arnold Mitchell, G. H. Fellowes Prynne, and E. Howley Sim; *Hon. Treasurer*, Mr. F. G. F. Hooper; *Hon. Librarian*, Mr. F. J. Osborne Smith; *Assistant Librarians*, Messrs. C. H. F. Comyn and W. A. Jeckells; *Hon. Secretaries*, Messrs. R. S. Balfour and and H. P. G. Maule; *Honoray Auditors*, Messrs. E. Greenop and G. M. Nicholson; *Hon. Solicitor*, Mr. W. H. Jamieson; and *Secretary and Registrar*, Mr. D. G. Driver. Mr. Searles Wood then read his paper as follows:—

I have no idea how the Committee intended this subject to be divided between Mr. Appelbee and myself, but, as I suppose the most useful purpose would be served by each of us speaking from his own experience the things that he has learnt, I propose to deal with houses of the rental value of from 80*l.* to 200*l.*, Mr. Appelbee having kindly undertaken to treat on houses of the terrace and small semi-detached types.

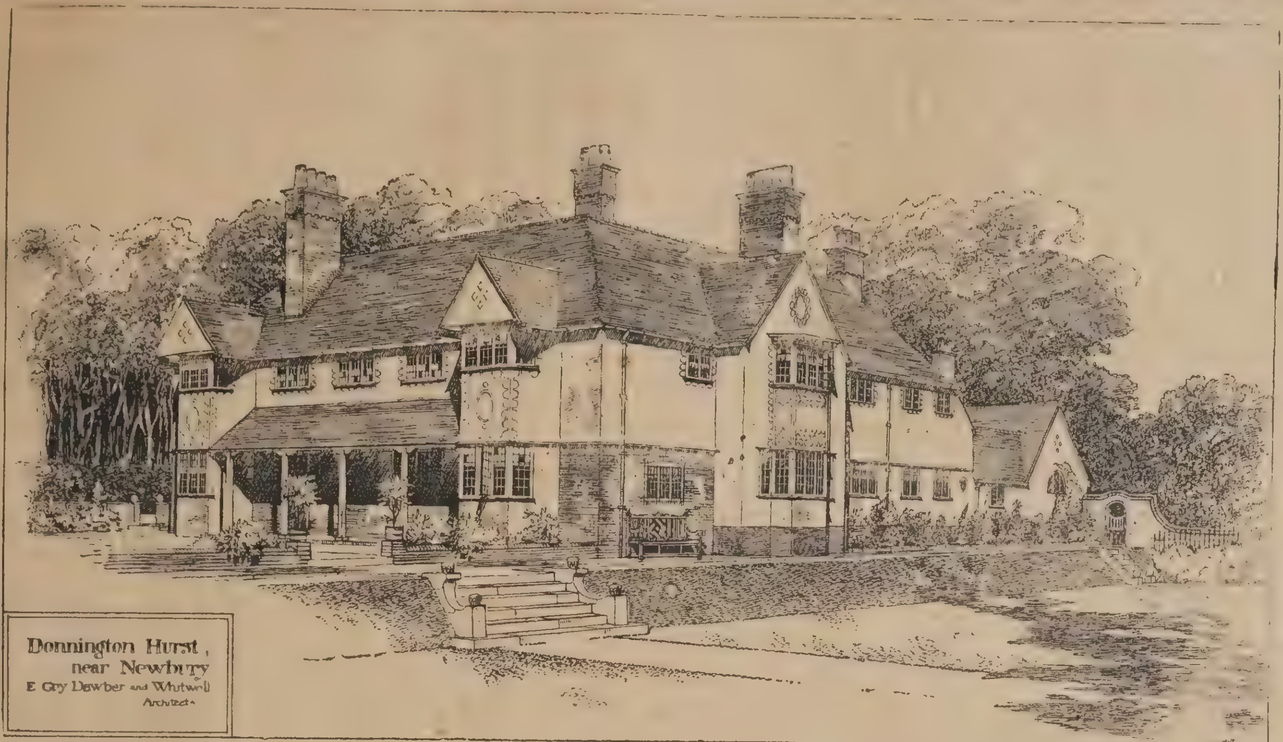
There is one catch-phrase current which it seems impossible to keep out of any conversation at the present time—I mean the reference to the man in the street; well, I take it that the majority of him live in either one or other of these various types of house.

One of the peculiarities of the suburban tenant is that he seems to wear the neighbourhood out in the first term of the tenancy, and it thus happens that the oldest inhabitant in most suburbs has been in occupation about seven years. Now, this being the case, it is obvious that in planning these houses they must be designed to suit the multitude, and not individual tastes.

The man in the street is a man of social habits, with a fairly large circle of acquaintances. Let us take a typical family, consisting of the father and mother, with a grown-up family of four, two boys and two girls—the father and two boys playing golf and billiards, the mother and girls devoted to cards. Now, what should be the proportion of the various rooms to suit such a family, supposing we fix the rent at 200*l.*, and give an acre and a half of ground at 25*l.* per acre per annum. This leaves in round figures 3,000*l.* on a 5 per cent. basis as the cost of the house. The relative size of the several reception-rooms is the first consideration. The views of the man in the street and his wife are apt to differ in regard to which should be the larger, the drawing-room or the dining-room. I get over this difficulty sometimes by making the drawing-room, dining-room, and billiard-room all the same size, and it makes a very satisfactory house, but I find it better to give the advantage to the drawing-room, as being the room in which most of the social functions take place, and the general living-room. I know it is difficult to convince the mere man that this is the case My experience is that in the inevitable compromise the drawing-room comes out the larger room. In houses of this kind I find that the luxury of a large hall cannot be afforded; it is a beautiful feature in large houses, but where it can only be obtained by the sacrifice of size in the dining-room and drawing-room, I am convinced it does not pay. (I generally lay a parquet floor in the drawing-room, though nowadays dances are generally given in the various public halls that are found in most suburban districts.) I had some few years ago to advise trustees as to advancing their money to build a small house for a young couple who were just married, who thought they would like a quaint little house built out of the wife's trust money. When the plans were submitted to me I reported that in the event of the house being to let considerable additions would have to be made. In spite of my advice the house was built and occupied by the young couple for, I think, about two years, and they then took an ordinary house in the country, and the quaint conceit remaining empty over a year, and was then let to a tenant who insisted on the trustees adding another wing and some other accommodations that by no stretch of the imagination could be considered quaint. This incident has often occurred to me when I have seen similar designs in the professional papers, and I wonder



GROUND PLAN, HOUSE AT CLEY, NORFOLK.



what alterations will be made in the course of time, and such thoughts as these have a chastening influence whenever I feel disposed to attempt the unusual. I hope I shall not be misunderstood. I have a great admiration for the work of many of our talented architects whose houses will always interest, but small suburban houses must to a certain extent follow the more or less stereotyped plan which, after all, is the concentrated experience of many generations of builders.

I personally have a great objection to that form of hall which consists of a passage from the front to the back of the house. It quite, to to my mind, destroys the comfort of the hall, and in small houses I think what is called the garden entrance is unnecessary. I like also, if possible, to shut off the staircase from the hall.

The position of the billiard-room in relation to the house wants careful consideration. I always try and make a separate approach to the billiard-room from the outside. In the suburbs it is usual to have certain evenings in the week for billiards, when it is understood that your friends will drop in without a special invitation for a friendly game, or to play in a handicap. If there is a separate entrance these visitors can come into the room without disturbing the other members of the family, and can leave without rousing the household if the billiard-room is kept open late. It always seems to me that a billiard-room in a small house such as we are now considering is an expensive feature if you look at it in the light of its being the largest reception-room in the house being devoted to a game which on the average is not played for more than four hours a week. To obviate this, I have found Burnett's patent machinery for lowering the table into a pit and allowing a floor to be laid over the space makes this room available for other purposes of entertainment. This machine consists of four screws which work in a steel frame, and are connected by means of bevel cogs so as to all work together and thus prevent the travelling table jambing; the screws bring the table up to the steel bed plate, and the table comes up each time to a dead level. When the table is lowered a beam of oak is laid across the opening and the flooring, made in convenient widths, is laid on the beam and the ends caught by a hinged board secured with cups and screws which hold the false floor in its place. It takes about twenty minutes to get the table down and the false floor laid, and about thirty minutes to get the table back again and the false floor stowed away in the pit.

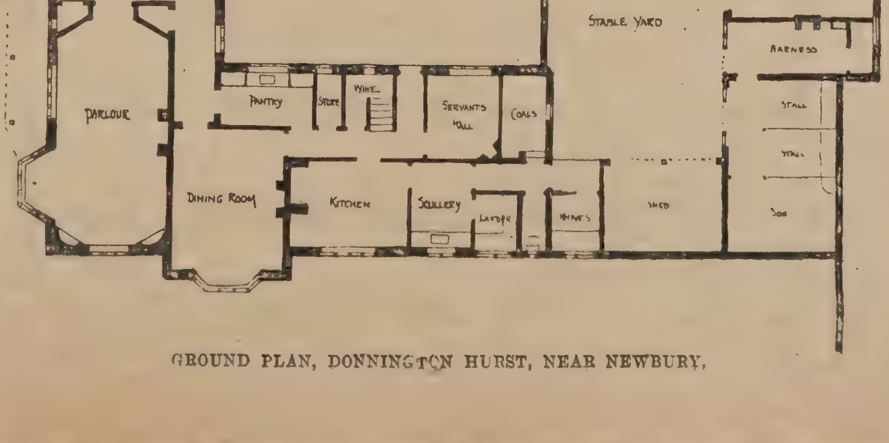
I find it suits the man in the street to give him a dining-room, drawing-room, and billiard-room, the last taking the place of the small sitting-room usually called the morning-room or library on the ground floor. The billiard-room in this case has usually a writing-desk in it where the men of the family do what writing they have to do, and, in fact, use it as a general morning-room. This room should always be heated by hot-water pipes. Nothing is more miserable than to go into a cold billiard-room after dinner, and the open fire is apt to make one set of cushions softer than the others. If this plan is adopted the ladies want a room upstairs for work, and this can often conveniently be made in the attic, and when so placed piano or violin practice can be indulged in without fear for the feelings of the rest of the household.

The relative position of the kitchen to the dining-room is another point which regulates the plan to a great extent so as to avoid as much as possible having to cross the house in serving the meals; but it is a moot point whether, in the sized dining-rooms that are usual in the class of house under consideration, two doors—one from the hall and one from the service passage—are not more conducive to draught than the convenience of the service warrants. But I am not in favour of hatches.

The dining-room should never be less than 15 ft. wide for the convenience of serving round the table. A recessed fireplace on the side is also a pleasant feature, and gives interest to the room.

The kitchen should be so placed that the housemaid's pantry can be reached without passing through the kitchen. This pantry should be as large as possible, and all the glass and silver should be washed and cleaned in it.

The kitchen should also be a good size. It should be remembered that, in addition to the work of preparing the food, it is the living-room of the servants. It is not usual, in houses of the size we are considering, to provide a servants' hall, and therefore the kitchen should be made larger to suit the double purpose. Good light on the right-hand of the range is very important, and a cheerful outlook, if possible. In these houses I always make the boilers in the ranges of the kitchen and scullery both work the hot-water system, so that when in the summer the cooking is done on the smaller range, there is still a circulation of hot water over the house. I find it a good plan also to have a copper cylinder on the flow on the first floor as well as the hot tank in the



GROUND PLAN, DONNINGTON HURST, NEAR NEWBURY.

cistern room. This cylinder heats the linen-closet and gives a good storage of hot water

If the family are given to taking cold baths in the morning there is a great run on the bath-room, and I find that a second bathroom is a good feature, if possible; but if not, a spray bath on the head of the slipper bath enables the bath to be used much more quickly.

The staircase is one of the few opportunities in a house of this character that offer scope for a little careful detail. Of the three types of stairs—the open well, the dog leg, and the stairs between walls—I fancy the last gives a little more mystery to the planning, the upper floor not being disclosed until the half space is turned. A second staircase is a good feature, if it can be arranged.

COND, ON THE MOSEL, GERMANY. FROM A WATER-COLOUR DRAWING BY E. GUY DAWBER.

For the family we are planning for, eight bedrooms, a dressing-room and a workroom at least are needed.

As a comparison, taking the area of the rooms on the ground floor as 100, the following is the proportion of a plan of the rental value of 200*l.* :—

Billiard-room	24	Bedroom	12
Drawing "	19	"	7
Dining "	15	"	16
Hall	11	"	15
Kitchen	9	"	9
Scullery	5	"	9
Staircase	4	"	5
Housemaid's pantry, cupboards, water-closet, and lobby	13	"	9
	100		82

Now let us see what reductions are required for one of 80*l.* We will take the ground as a third of an acre. This would represent a plot 60 ft. by 240 ft., and the ground rent would be 13*l.* 10*s.* This leaves, on a 5 per cent. basis, 1,300*l.* for the house. I make the dining-room 16 ft. by 16 ft., with a large bay, the drawing-room 16 ft. by 15 ft., with folding doors into the hall, which is arranged so as to be used as a morning-room, or in conjunction with the drawing-room. The vestibule is approached through the housemaid's pantry, thus allowing the servant to answer the door without passing through the hall. The housemaid's pantry is arranged with a large gas-stove, so as to make it a summer kitchen. The kitchen is a fair size, with a scullery as a place for dish-washing only. On the first floor are four bedrooms, corresponding in area to the four rooms on the ground floor, the bath-room and water-closet being over the vestibule. In the attic are two bedrooms, dressing-room, linen-closet, and cistern-room. I think it is very important, from a sanitary point of view, to put the cistern in such a position that it can be readily and easily examined. Making the same comparison as before, the areas are:—

Dining-room	30
Drawing-room	28
Hall	10
Staircase	6
Kitchen	13
Scullery	4
Housemaid's pantry	6
Lavatory	3
	100

This house, with reduced area, still gives good accommodation for reasonable social usages, and in both the endeavour has been to work out the plans with the minimum amount of passage-ways.

In giving the percentage areas I have been endeavouring to arrive at the just proportion between the various rooms in houses such as we have under consideration. It appears to me that it would be a useful table if we could arrange some such scale. The problem appears to me to be as follows: Given the rental value of the house and no conditions as to the size of particular rooms being imposed, what has been found to be the relative area of each room as the result of experience? Of course, having fixed the areas for the ground floor, the other floors must follow more or less these dimensions. The comparison also depends on the houses compared being equally well built.

I have now described two plans at either end of my scale. The intermediate plans show a gradual increase in the scale of the accommodation, and you will find that as you rise from the lower to the higher rent the tenants become much more exigent. The question, I think, that would be most profitable to discuss is whether modern planning is abreast with the spirit of the age. Most buildings designed for particular purposes nowadays are highly specialised. Do our domestic buildings compare successfully with these specialised buildings in suiting the requirements of the persons occupying them, or are they governed by considerations other than the needs of the tenants, such as the reproduction of old buildings whose appropriateness to modern usage is rather open to question?

Mr. Appelbee's Paper.

Mr. Appelbee next read his paper as follows:—It is impossible in the time at my disposal to-night to do more than glance at a few of the points which influence the design of small suburban houses. My illustrations are limited to houses of not more than ten rooms and of these I have excluded the very smallest where it is probable no servant would be kept. Also excluded are houses having rooms for special purposes, such as doctors' and artists'.

COCHEM, ON THE MOSEL, GERMANY. FROM A WATER-COLOUR DRAWING BY E. GUY DAWBER.

BRUGES. FROM A WATER-COLOUR DRAWING BY E. GUY DAWBER.

The first point to influence the design is the site. It is obvious that all, especially in London, cannot have the advantages of building on gravel or high land, but the selection of a particular road is open to most. Personally, I would not care to own a house in a road running east and west, or, even worse, north-west to south-east, unless the site is large enough to permit side lighting as well as from front and rear.

Rooms should be so arranged that the sun may enter at least once every twenty-four hours. This is not always possible; but to arrange living-rooms where it is impossible, even during long summer days, seems to me little short of criminal. Great care is, however, necessary, as different rooms require the sun at different times of the day, the general rule being that it follows with our day's work: our bedrooms should face the east or south-east, the breakfast-room south-east, the drawing-room south to south-west, the kitchen south-east, while a study or library north, with a sunny window as well, or east. In a terrace house the fronts should be south-east and north-west; in others where side light is also obtainable more latitude is permissible.

As to prospect, it is nearly always the same thing for the dweller near a large town—buildings everywhere. There should, however, be trees in front and in the garden, and creepers on the house itself.

The next point that will come under consideration is the cost, which will fix the size and number of the rooms and the amount that can be expended on their fittings and decoration.

The common system of making approximate estimates by cubing or areas is apt to be very misleading. For example, the areas of all from the sitting-rooms to the pantries may be increased by 50 per cent., while the cost is only increased about 20 per cent., assuming that the heights are kept the same and the fittings of the same quality. To illustrate this take a terrace house 16 ft. between the party walls and 25 ft. from front to back:

area = 25ft. by 16ft. = 400 square feet.

Enlarge to 20 ft. from party wall to party wall and 30 ft. from back to front:

area = 30ft. by 20ft. = 600 square feet.

Assume the heights to be the same and compare the cost. Party walls first 50 ft. and secondly 60 ft. long = 20 per cent. increase, front and back walls first 32 ft. and secondly 40 ft. = say 20 per cent. increase (is really rather less). Skirtings and cornices will follow the walls. The finish to floors and ceilings and the roofing will obviously show a 50 per cent. increase. The joists of the upper floors will, however, show more, more depth being required owing to increase of span, and will be found to require in the particular instance quoted an additional 20 per cent. Many items require no increase whatever, *i.e.*, range, copper, stoves, and mantels. With the drainage and plumbing work, which is very expensive, the main items of manholes, vertical soil pipes and service pipes, bath and water-closet apparatus and sinks are not increased, and it is only the horizontal pipes between them, and these to the very small amount of 20 per cent.

For the purpose of this paper I have analysed the bill of quantities of a 1,450*l.* house, and I find on the above principles

	£		£
About	240	with no increase =	240
"	930	" 20 per cent. " =	1,107
"	280	" 50 per cent. " =	420
		And for extra depth of of floor joists, say ..	13
	£1,450		£1,780

or between 22 per cent. and 23 per cent. increase of cost for 50 per cent. additional accommodation.

While on the subject of cost, a word of warning should be said on what is perhaps the greatest architectural sin of the Victorian age, viz., the façade built in a more expensive manner than the return faces. This arrangement usually gives a thin cardboard-like effect and entirely destroys architectural solidity.

The first sketches should always show the principal furniture, and the relationship of doors, windows, and fireplaces should be considered with regard to each other and to the furniture.

COTTAGES, MATLOCK DALE. E. GUY DAWBER, ARCHITECT.

MATLOCK CHAPEL, DERBYSHIRE. E. GUY DAWBER, ARCHITECT.

Inside v. Outside Chimneys.

If the fires are well grouped, two, or at the most three, chimney-stacks will be required. If they are on inside walls the house is more economically warmed, and there is less chance of a down draught from a cold flue. On the other hand, a compact plan usually brings the internal doors together around a small hall or landing, and in order to prevent the doors spoiling the sitting space around the fires, or the plan from becoming straggling, the chimney breasts have usually to be planned in the outside walls.

The Casement v. the Double-hung Sash.

The double-hung sash is unquestionably convenient for lighting, ventilation, cleaning, and it is easy to keep clear of blinds and curtains: it is easily made weathertight, and is simple to fasten, but it probably requires more skill to make its appearance equal to that of a casement. The mullioned window, especially when long and low and without a transome, is undoubtedly picturesque. The casements are difficult to keep weathertight unless they open outwards, in which case one at least of an odd number of lights can never be cleaned from the inside of the room, and they interfere with flowers on the window-sill. An even number of lights for cleaning purposes must have all to open in pairs. Opening inwards overcomes the difficulty of cleaning, which is perhaps the greatest, but makes other difficulties with blinds, curtains, or a window-seat, and the absence of the weathertight qualities.

The Dining-room

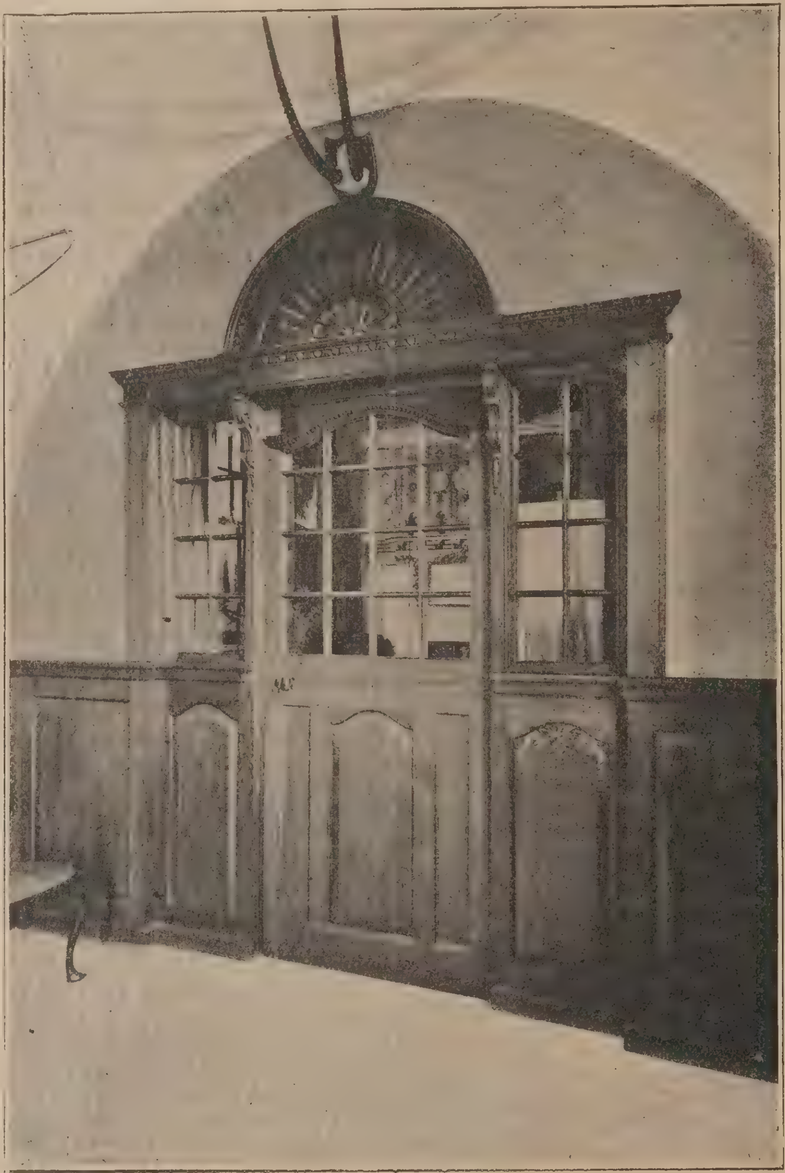
in a house of this class is the most important room, and in planning this the furniture should be sketched in, and its dual use as room for meals and the family sitting-room taken into consideration. A dining-table varies from 3 ft. 6 in. to 4 ft. 6 in. wide, and there should be room for one 6 ft. to 7 ft. long, and more at times, and a sideboard, one or two armchairs, often a couch or settee; and if there is no study the books of the house and a writing-table will be here also. The room, therefore, should not be too small (as it often is), and in this room in particular it is well to remember that doubling the area will not double the cost of a room. The best aspect for this room is south-east. Where this room is a general living-room as well as dining-room, a large bay or transept, making the room L-shaped, gives an interesting as well as convenient room. The bay is purely living-room, the other end of the L having the dining-table; the remaining portion has the fireplace, and may be considered as belonging to each branch of the L in turn.

The Drawing-room

in small houses is generally somewhat smaller than the dining-room, and is pleasant if it has the afternoon sun. A third sitting-room is a useful addition, and if on special occasions it can be thrown into connection with one of the others, so much the better. Its chief use will vary very much in different houses, as breakfast-room, morning-room, library, and den.

Bedrooms, &c.

Roughly one-third of our time is spent in bed, and, therefore, the bedrooms of the house should have particular care in their planning. An adult should have 2,500 cubic ft. of air per hour, equal to a room nearly 20 ft. by 13 ft. by 9 ft.; therefore the necessity for ensuring the repeated change of air in a room is obvious. Not only an exit flue but an inlet is required. A deep bottom bead on a sash window enables air to enter at the meeting rail. I do not think the casement can be made to give this advantage. Sun also is very essential to keep the room sweet and healthy, and should enter early in the day. A bedroom hot in the evening from a setting sun is disliked by most people. If the room is near an internal angle of the building, see that the window is not commanded by one in the return wall; in planning the room, show the principal furniture, the bed, with the light, if possible, from the side and space for a wardrobe. The dressing-table should have the back of the mirror to the window or between the windows if there are two; consideration should also be given to the morning opening of the window without having to move furniture first. In artificially lighting this room one light should be so arranged with regard to the dressing-table that the light falls on the dresser's face and not on the mirror. In a small room, if the bed occupies the position already suggested, this one light will probably serve the whole room. If electric, it is convenient to be able to switch it on and off from either the door or while lying in bed.



THE VESTIBULE, "HARTHURY," GLOUCESTERSHIRE. E. GUY DAWBER, ARCHITECT.

Bath, Lavatory and Water-closet.

In connection with the bedrooms the bath-room will be much used, and in these small houses it assumes a much greater relative importance than in large houses. In addition to the bath there should be a fitted lavatory, both to have hot and cold water (this arrangement means a great saving of labour in the house by lessening the amount of hot and cold water carried to each bedroom, and subsequent removal of slops). Some polished copper hot-water rails for airing towels are useful, and help to warm the room. The bath most commonly used has a roll top edge and no casing: this seems to me a mistake. As a rule, casings should be omitted whenever possible, that every part may be kept clean; but a bath is so big in bulk, and has usually to be placed against the wall so that no one can possibly reach over to clean the vertical space between the side of the bath and the wall. The shallow space between the bottom of the bath and the floor is almost as bad. Splashing over of water, often soapy, is inevitable, and the dust clings.

As near as possible to the bathroom should be the upstairs water-closet, but never in it. These two apartments seem to be the most difficult of all to arrange: they should be near the bedrooms, since the bathroom partially acts as a dressing-room, yet so retired that persons using the water-closet should not advertise their movements all over the rest of the house, and to this end do not permit any borrowed light from either to a neighbouring passage, and be very careful in the selection of the water-closet apparatus and the water-waste preventer that they may be as silent as possible. Next it is important to remember that a water-closet is not merely an apartment 6 ft. by 4 ft., or thereabouts, which may be partitioned off anywhere. It must not be overlooked that it is often 30 ft. high; in other words, the soil-pipe is an essential part of it, and if you place a water-closet on the principal elevation near the entrance door, this soil-pipe and the ventilation pipe which extends it will spoil the effect of everything. Bath and lavatory wastes are nearly as bad. Over the scullery, or some of the adjacent pantry or kitchen parts, is the natural place; but see that the water-closet is not over the larder—a point to which it always seems to gravitate. All places having water supplied to them should be as near to one another as possible, for economy of pipe work and also because of accidental overflows. A long distance, too, from the kitchen boiler to the bath or lavatory generally means that the circulating pipes have to cross hall or sitting-room, and as few people care to see them exposed here, they get boxed up in the floors and other improper and inaccessible places.

The Kitchen, Offices and Servants' Quarters

in small London houses are usually very cramped and deficient. The points about increase of size should be borne in mind here in particular. The kitchen is also the servants' living-room, and therefore should have as good an outlook as possible. Adjoining should be the scullery, primarily intended for the keeping and cleansing of the cooking utensils and the rougher part of the preparation of the food; but many other duties are now thrust on to it. The larder must be placed so that it is kept cool and away from the steam of the scullery copper. A lock-up store should be provided, where the lady of the house will keep extra groceries in reserve, and where dinner and other services and glass are kept. An exceedingly useful addition, even in the smallest house, is a china or housemaid's pantry provided with a lead-lined sink. Here tea and breakfast services are washed and stored, also plate and glass. Table-linen is also kept here. By attending to the lighter work here the mistress and young ladies of the house can assist without interfering with the servants. If planned as an ante-room between the kitchen and main house, it will also act as a ventilated disconnecting lobby, and help to prevent an unavoidable cookery smell extending all over the house.

The Stairs

may be made the most picturesque part of the house, but they must be practical also; they will have to be used by the very young and the infirm. Winders are often dangerous, and should never be curved on plan (as they often are at the foot of the stairs) if it is intended to carpet them. Bulky furniture will also have to go up and down, and at times a coffin.

The Plan

The width of the site is the next point that will determine the plan. Narrow sites must make the house one of a row; at 25 ft. it is possible to make it "semi-detached"; 40 ft. to 50 ft. is the least on which the smallest detached house will look well. The varieties of plan possible are, I think, more than is commonly supposed. In a terrace-house the simplest is to put two rooms on a floor facing the front and back of the site respectively, a part of one being cut off for the staircase, or the staircase may be put in between them. In these cases the kitchen and offices occupy a basement storey, two sitting-rooms on the ground floor, with probably two floors of sleeping-rooms over. Constructively cheap, owing to small amount of foundation and roofing (which the increased thickness of walls will not outweigh), they are very inconvenient, owing to the amount of stairs. There is, of course, three times as much staircase in a four-storey house as in one of two storeys. The first variation is to bring the kitchen to the ground floor in a wing behind the stairs, with the result that the look-out from one sitting-room is quite spoiled, the scullery or coals

THE OUTER COURTYARD, ITTON COURT, CHEPSTOW. E. GUY DAWBER, ARCHITECT.

enjoying the view. Another arrangement transposes sitting-room and kitchen department, opening the kitchen from the centre of the house. In both these types the getting in and out of coals and dust is a great difficulty unless there is a back way. In the Midlands it is a common practice in small houses of this kind to make a passage at the side common to two houses for this purpose, and as a tradesmen's entrance.

Terrace Houses.

Larger terrace houses are obtained by placing the drawing-room or a study upstairs and an additional floor of bedrooms. If this is done, great care must be taken with the approach. Most of us can probably call to mind examples where the stair is too narrow, and the bath and water-closet department too conspicuous *en route*. All terrace houses are open to many objections: the difficulty of getting sunshine to all rooms has been mentioned, and the difficulty with coals and dust where there is no basement. To these must be added that the drains, with rare exceptions, must pass under the building, and the transmission of sound from one house to another is very considerable. In the London district there is also the æsthetic objection that the party-walls must show above the roofs, and they are very difficult to treat in a satisfactory way. In many of the London districts external walls within 10 ft. of another house have also to have parapets above the roof. These points much affect the design. For example, a series of gables with their ridges over the centre of each house, and parallel to the party-walls, would work out in a most distressing and expensive manner.

Semi-detached Houses.

On narrow plots the semi-detached house is very like the terrace house already described. The front doors can, however, be put at the side away from the party-wall, and thus secure greater privacy; but this generally requires a wider plot. These pairs of symmetrically planned houses seem to me to be among the most unsatisfactory designs ever produced. A symmetrical elevation to the road has a great pier instead of opening as the central feature, and this is usually capped by the end of the parapet of the party-wall, which goes up by all sorts of irregular turns so much higher than all the roofs, turrets, dormers, &c., within 4 ft. or so of it. Sooner or later the houses drift into different ownership, and one paints his woodwork white and the other black, and the disaster is complete. The remedy is simple: do not plan a symmetrical pair.

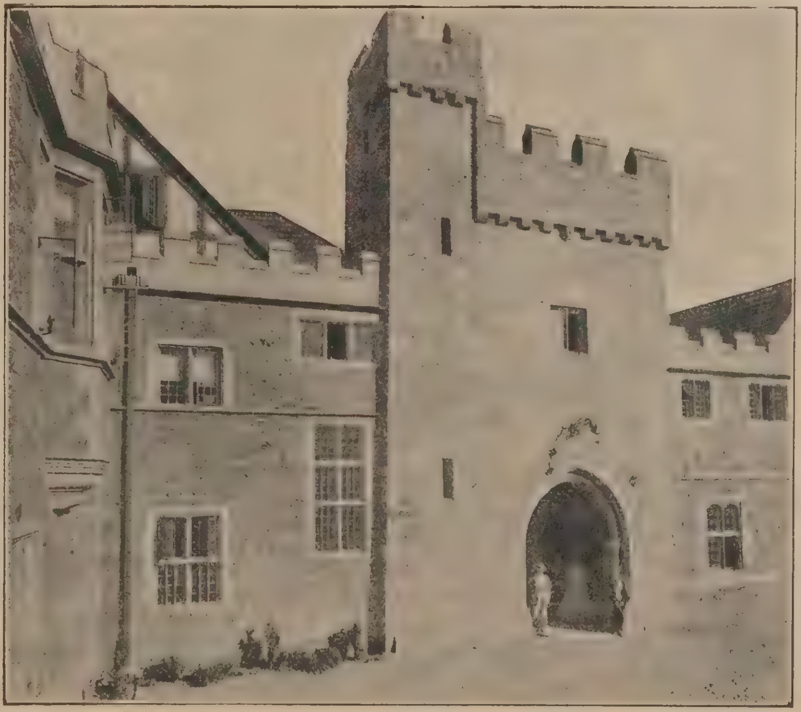
Larger detached and semi-detached houses are so varied in plan they are difficult to classify.

A most ingenious arrangement, which I do not remember to have seen elsewhere, was adopted in one house of making scullery, larder, coals, &c., less in height than the principal rooms, with a sort of mezzanine over them approached from the half-landing upstaircase. The mezzanine contained bathroom, water-closet and a good-sized linen-room: these in turn were kept very low, and the servants' bedroom was placed over. This part of the house was therefore three floors high against two elsewhere, but the top floor of the wing was only some six steps above the general first floor. This placing of the servant's bedroom would, I think, be generally appreciated both by servant and mistress.

A discussion followed in which Messrs. S. F. Clarkson, H. Lovegrove, and Henry T. Hare took part, and Messrs. H. D. Searles Wood and H. R. Appelbee briefly replied to the vote of thanks which was accorded to them on the motion of Mr. Clarkson, seconded by Mr. Lovegrove.

HENLEY'S NEW TOWN HALL.

THE new Town Hall and Municipal Buildings erected in the Market Place, Henley, as a permanent memorial of the reign of Queen Victoria, were opened recently. The new Hall, which is in the Renaissance style of architecture, has been erected according to the designs of Mr. Henry. T. Hare, F.R.I.B.A. The main entrance is approached by a low flight of stone steps, which lead to a porch. There are light iron gates instead of doors. Opposite the entrance is a flight of steps leading to the basement. The principal room is a drill hall, 40ft. by 25ft., warmed by hot-air pipes and available for other gatherings. There are two large offices with windows above the pavement, the ground level being half way up the rooms. One is intended for the surveyor's office. There is also a strong room, and rooms for the town sergeant. There is also an armoury and a store room. At the west end provision is made for lavatories, heating chambers and a coal cellar. From the porch are two staircases—to the right and left—leading to the rooms on the ground floor. There is a large entrance hall, 24ft. by 12ft., with a cloak-room and lavatory on each side. The other rooms on the ground floor are two committee rooms and a council chamber, above the drill hall. At the west end is a large kitchen, with a serving room. From this room is a lift to the large hall above. There is another staircase at the west end leading to the council chamber and Town Hall. A flight of Hopton-Wood stone steps leads to the main landing. The large hall is entered by three doors at the east end and one at the west end. The hall is 60 ft. by 40ft., with stage at the west end. There will be seating accommodation for 450 persons. At the back is a retiring room and a service room. The large hall is well lighted and should prove useful for concerts, &c. The council chamber is oak panelled. The middle light of the window over the front entrance is of stained glass. Running from the entrance hall on the ground floor is an ante-room, and on each side of this is a committee room. At the west end are rooms for the hall-keeper. The heating and ventilating was carried out by the Grahtryx Ventilating and Engineering Company. The roof is covered with Colley Weston stone slates. The work has been carried out by Mr. McCarthy E. Fitt, of Reading, with Mr. G. W. Simpson as clerk of the works. The original tender was £10,132, but this amount has been considerably exceeded.



THE ENTRANCE, ITTON COURT, CHEPSTOW.

GREYFRIARS CHURCH, ABERDEEN.

A REBUKE TO THE PHILISTINES.

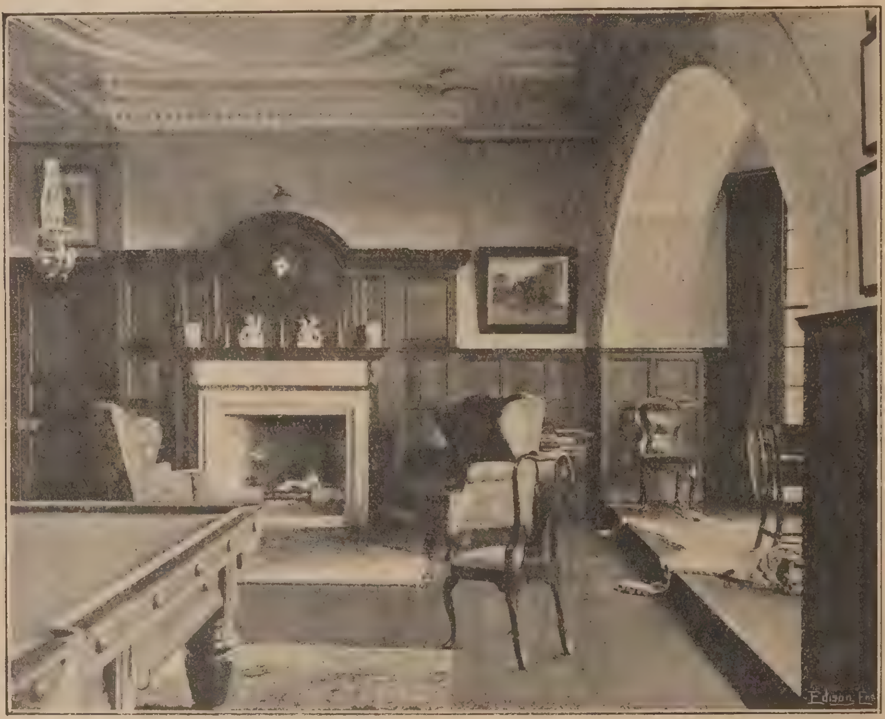
THE efforts to preserve the old Greyfriars Church at Aberdeen have proved fruitless, for after years of discussion the local authorities have decided to pull it down. This was the plaint of Professor Cooper's recent paper before the Glasgow Archæological Society. Again the Philistines, he remarked, had triumphed, and were rejoicing over the impending demolition of another of the scanty stock of pre-Reformation churches which Scotland could boast of. At the Whitsunday term the ancient church of Greyfriars, the principal fragment of mediæval architecture in the new town of that city, would be in the hands of the destroyers, and in the course of a few weeks would be swept utterly away.

There had been a talk of preserving the one notable feature of the building, the great window which was to have been incorporated in the new church; but he heard that it was doubtful if even this would be done. The result had not been reached without a struggle. The University, the Presbytery, the Ecclesiological Society of Aberdeen, eminent benefactors of the city, artists like Sir George Reid, and architects like Mr. Whyte, the architect of the University tower, one of the finest structures in the city, had pleaded in vain.

Their arguments had been reinforced with offers of large sums of money. There was one offer of £10,000. But all was to no purpose. The forces of Gath had won the victory, and all that could now be done was for societies like their own to preserve some written and pictorial records of an edifice which, alike on architectural and historical grounds, deserved a better fate.

Greyfriars Church was one of the convents of the Observantine branch of the Franciscan Order, which was introduced into Scotland by James I. early in the fifteenth century. The Aberdeen house was the third of their houses in Scotland, the two earlier being Edinburgh and St. Andrews. The present church was the second church designed by a very eminent Aberdeen architect, Alexander Galloway, of Kinkell, and was built at the expense of Bishop Gavin Dunbar, who sat as Bishop of Aberdeen from 1518 to 1537. It was a singularly fine specimen of late Gothic, and was important in the study of Scottish architecture as the signed work of a Scotch architect of that date. It was a proof that Gothic architecture of that period in Scotland had still great capacities.

The Professor went on to speak of the history of the church after the Reformation, and exhibited a fine series of measured drawings by Mr. A. R. Mackenzie, architect, of Aberdeen, as well as a water-colour drawing by Mr. Murray, Aberdeen. These drawings we hope to be able to reproduce soon.



BILLIARD-ROOM, "HARTPURY," GLOUCESTERSHIRE. E. GUY DAWBER, ARCHITECT.
MODELLED PLASTERWORK BY GEORGE P. BANKART.

PRESENT CONDITION OF THE BUILDING INDUSTRY.

ON page 79 of our issue for March 6th last we published a report of Mr. Thomas Blashill's paper before the Surveyors' Institution on "The Present Condition of the Building Industry." The discussion on it was renewed at the meeting of the Institution held on March 25th. Mr. Philip E. Pilditch pointed out that considerable attention had been directed to the question of the effectiveness of present-day labour. In the course of discussion complaint had been made of the indifference and lack of keenness of the modern workman. Experience had shown him that, even among the best class of workmen, about 10 per cent. did not come to work on Monday. A second and more serious ground of complaint was the tendency of the workman to act on the belief that to benefit himself by raising the rate of wages he should reduce the output as much as possible. In many sections of the trade the overtime scale of wages—rate and a quarter—was almost prohibitive. The unions had not been nearly so careful as they should be in regard to the class of men they admitted, and thus many men obtained the full rate when their skill was worth, perhaps, 25 per cent. less. During the last 25 or 30 years wages in the building trades had risen considerably, but the average workman did not do as good work as formerly.

Mr. A. Vernon emphasised the need of obviating in some way or other the levelling-down principle fostered by trade unionism in its present form, and referred to the public disadvantages arising from the increased cost of house-building. Twenty per cent. of the rise in cost was divided equally between capital and labour, and 15 or 20 per cent more was due to the effect of unnecessary by-laws.

Mr. Blashill, replying on the discussion, maintained that the builders ought to be encouraged to do the steel work, if they would undertake it. With regard to the labour question, no one could prove that trade unions by any written law advocated the diminution of work, but there could be no doubt that individuals had done so. A builder of position had written to say that during the last ten years the cost of labour had increased 75 to 100 per cent. If that were so, and the rate of wages had only risen 10 per cent., it followed that there was a large margin to be accounted for. He saw no reason why the apprenticeship system should not again be revived.

New Patents.

These patents are open to opposition until May 6th.

1900.—Sewage Disposal.—4,173. D. CAMERON, 1 Sylvan Road, Pennsylvania; F. J. COMMIN, 7 Bedford Circus; and A. J. MARTIN, Bradninch House; all of Exeter. The object of this invention is to do away with the need for pumping sewage in flat districts, or, when this is impossible, to lessen the work of lifting the sewage. Septic tanks are placed as high up in the outfall sewer as possible, and as the sewage passes through them the solid matter is acted upon and destroyed by the micro-organisms, so that the effluent may be conveyed to the outfall at the flattest gradient at which a sewer of the desired size will carry it.

Water-closet Standards.—5,852. H. H. GREEN, Nelson Street, Wolverhampton. The standards are provided with screwed feet which can be raised or lowered to suit different basins or to compensate for unevenness of the floor.

Chimney Cowls.—6,343. W., J. T. and J. T. POLLARD, all of 36 West Gate, Burnley. The cowl is mounted on ball bearings, the balls being of metal, glass, porcelain, or other suitable material.

Travelling Cranes.—7,883. F. W. TANNETT-WALKER, Hunslet, Leeds. The power for lifting is communicated to the crab on the traveller by a rope running from end to end of the shop. The carriage on the traveller may be moved across the shop at any part. The hoisting rope has one end fixed to the carriage and the other end to the traveller, and passes around pulleys on the latter and on the crab, so that the movement of the carriage raises or lowers the weight.

Theodolite Stands.—17,632. A. KAUFMANN, Kaiser Friedrich Ring 20, Wiesbaden, Prussia. This stand can be closed up sufficiently small to go in the coat-pocket. It consists of an ordinary flat top-piece to which three coiled strips of aluminium are fitted. When required they are drawn out in the form of legs.

The following specifications were published on Saturday last, and are open to opposition until May 13th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—4,552, DRESSER, pipe couplings. 4,590, WINTRINGHAM AND WILLS, friction rollers for woodworking machinery. 4,689, HIGGINS, treatment of wood for preservative, desiccating and seasoning purposes. 6,241, LEONARD, apparatus for painting or cleaning columns, pipes, &c. 6,255, CHARLESWORTH, device for fastening windows. 6,595, SPURWAY, straw roofing. 6,865, SUNDERLAND, SUNDERLAND AND MARSHALL, apparatus for the generation of acetylene gas. 7,945, GRAY, construction of fireproof flooring or roofing. 8,029, HILL, Venetian blind furniture. 8,235, GLOVER, street and similar gas lamps. 8,394, RHODES AND GAUNT, syphonic flushing apparatus. 8,652, SEWARD AND WALTON, method of ventilating buildings. 11,267, IMRAY (*Opalite Tile Company*), manufacture of glass tiles. 13,658, GRAHAM, apparatus for automatically emptying bacteria beds or filters, tanks, &c. 14,152, DYMOND (*Smith*), dry closets and refuse incinerators. 14,620, LETTICE, disinfecting apparatus for water-closets. 19,136, WELDON, brick-making machines. 21,466, POWELL, gate valves.

1901.—437, BROOKES (*Fiske*), kilns for burning bricks. 1,873, PARSONS, means for moving and regulating sliding window sashes. 2,365, ADAMS AND ROWLEY, manufacture of flushing rims of earthenware water-closets, &c. 2,510, KATZENBERGER, flushing devices. 2,611, TWAMLEY, brick-kiln furnaces. 2,842, FLATHER, manufacture of varnish. 2,860, BARRETO, oven for use in the manufacture of bricks.

Builders' Notes.

Mr. Robert Weeks, master painter and decorator, of 3 Hobart Street, Stonehouse, died recently at the age of 74.

Mr. John Caton, junior, a well-known builder, of 78 Feilden Street, Blackburn, died recently at the age of 38 years. The deceased was the eldest son of Mr. John Caton, builder, of Feilden Street.

Partnership Dissolved.—The partnership heretofore subsisting between Messrs. Robert Ridgway, Ernest James Ridgway, and Walter George Ridgway, carrying on business as builders, contractors and estate agents at 2 Blurton Road, Lower Clapton, London, under the style or firm of R. Ridgway and Sons, has been dissolved by mutual consent as and from March 25th, 1901. All debts due to and owing by the said late firm will be received and paid by Messrs. Ernest James Ridgway and Walter George Ridgway.

London County Council.—At last week's meeting of the Council a long discussion arose in regard to the Clare Market housing scheme. The Housing of the Working Classes Committee submitted for approval an estimate of £26,285 for expenses connected with the erection of three blocks of dwellings on the Duke's Court site, Drury Lane, for the accommodation of 610 persons. One member pointed out that the rent per room in these buildings was 3s. a week, while the Guinness Trust were letting rooms at 2s. 1½d. per week. Mr. Beachcroft said that the Council could not rehouse people who had been living under crowded conditions. The law would not allow it. Mr. Alderman Alliston asked how people could pay proper rents when they were so scandalously underpaid. This housing question was, he said, a question of wages. It arose on account of the miserable conditions of unskilled labour. The Committee's estimate was eventually approved. Upon the recommendation of the Building Act Committee it was decided not to allow an iron and glass shelter to be erected at the entrance to De Keyser's Royal Hotel on the Victoria Embankment. It was also resolved to instruct the Highways Committee to consider (a) the routes along which extensions of the London tramways system ought to take; (b) the establishment of a tramway centre or centres to which extensions shall converge; (c) the railway extensions required to perfect the London overhead railway system; (d) the extensions required to perfect the London tube or underground railway system.

Lead Glazes.—A Parliamentary paper was issued last week on the use of lead in the manufacture of pottery, containing communications from Dr. Thorpe, the principal of the Government Laboratory, to the Home Office subsequent to the Report on Lead Compounds in pottery made by him and Dr. Oliver. Upon the relation between the composition of lead fritts and the solubility of their contained lead in 0·25 per cent. hydrochloric acid, he says the solubility appears to depend on the value of the ratio existing between the bases and the acids contained in the fritt, and if the fritt is to be practically insoluble in the reagent named this number must not exceed 1·45 or thereabouts. Experiments undertaken to discover whether the solubility is affected by the degree of fineness to which the fritt is ground show that the fineness has no practical bearing on the question up to the limits of practical requirements. From inquiries made in various parts of the country by Dr. Thorpe to ascertain whether, in the case of manufactures of ordinary red, brown and other coarse ware, there would be any practical hardship in requesting the use of blue lead or galena instead of red or white lead, if they declined to employ fritted lead, the impression he gained was that there would be none. Galena is the cheapest lead compound available, though it has the disadvantage that it must be ground, and to get the necessary mill might be a serious matter to a small manufacturer in view of the small amounts he would need to use.

Law Cases.

Workmen's Compensation: Employer's Unsuccessful Appeal.—The case of *Whitehead* v. *Reader* was heard in the Court of Appeal last week. This was an appeal from the award of the judge of the Coventry County Court under the Workmen's Compensation Act, 1897. The County Court judge's notes stated that the applicant for compensation was a carpenter, who at the time of the accident was in the employment of Reader. The applicant was sharpening one of his tools on a grindstone. The grindstone was worked by a leather band, which passed over shafting connected with a gas engine, and the band slipped off the stone. The applicant, in trying to replace the band, was caught by it, and was injured. The applicant had orders not to touch the machinery, and, in trying to replace the band as he did, he was acting contrary to his orders. It was objected that the accident did not arise out of and in the course of his employment. The County Court judge overruled the objection. It was admitted that for the present the applicant was totally incapacitated, and the County Court judge awarded him 12s. 6d. per week, being one-half of his average weekly earnings. The employer appealed. The Court, however, dismissed the appeal.

VILLAGE SCHOOLS, STOW-ON-THE-WOLD, GLOUCESTERSHIRE.
E. GUY DAWBER, ARCHITECT.

A Bristol Building Contract.—The case of *Krauss* v. *the Mayor and Corporation of Bristol* came before the Court of Appeal on March 25th. Mr. Justice Grantham had refused to refer the cause of a dispute between the plaintiff and the defendants to the arbitrator appointed under the contract in case disputes should arise between the parties. But this case, according to the plantiff's counsel, did not come under the head of a dispute such as usually arises under a building contract. The plaintiff brought his action to recover damages from the Corporation for delay and inconvenience caused by the Corporation, or those acting on their behalf, in connection with the erection of the isolation hospital of Bristol Lunatic Asylum. The plaintiff's claim for damage was, in brief, based upon the allegation that his men were prevented from laying the floor of the isolation hospital of the asylum because of the delay of the contractors, Messrs. Hayden and Sons, in providing the heating and ventilating apparatus, and the contractors who had to provide the grates and chimney-pieces had failed to do so in time. The Corporation applied to have the matters in dispute referred to the architect, who was to be the sole and final arbitrator, according to the contract, between the parties. Mr. Justice Grantham refused to stay the action, as he did not think that the case was one with which the arbitrator was intended to deal In the present case the architect had condemned the timber proposed to be used for the floors of the hospital on the ground that it was green and unseasoned. This was denied by Mr. Hudson and Mr. Inskip, who represented the respondent. Both contended that the delay complained of was outside the matters ordinarily in dispute in building contracts The Master of the Rolls, in giving judgment. said it was an ordinary building contract that was in question between the parties, and by a clause in that contract all matters in dispute incident to the work to be undertaken were to be settled by the arbitrator, who was the architect or clerk of works. The correspondence in the case showed that the matter in dispute was one for the arbitrator, and that such a dispute could be satisfactorily adjusted by him between the parties. The present case was on all fours with that of *Jackson* v. *the Bury Railway*; and the other cases which had been cited did not apply in this case. The dispute here really related to the material the builder was using, and that was a matter for arbitration in accordance with the agreement contained in the contract. With great submission, he could not accept the view of the case taken by Mr. Justice Grantham. The appeal of the Corporation must be allowed, with costs. All that the Court could do would be to stay the plaintiff's action; whether the parties went to arbitration was a matter for themselves. Lords Justices Collins and Romer concurred. The appeal was therefore allowed with costs.

An Interesting Case affecting House Drainage.—The case of *Hedley* v. *Webb* was heard in the Chancery Division of the High Court of Justice on Wednesday last. R. G. Marchant was the owner in fee of two plots of land on the Longlands Park Estate, Sidcup, and of one-half of Park Hill Road, running in front of the two plots. He conveyed the two plots and the half of the road to the plaintiff. The defendant was the owner of the adjoining plot and of half the road in front of it, and on this plot he had erected a pair of semi-detached houses. He laid down two sets of pipes from the water-closets of his two houses, which ultimately joined and ran into one common conduit which was connected with the sewer (vested in the local authority) in Park Hill Road. This connection with the sewer was made under the road in front of one of the plaintiff's plots. The plaintiff claimed a declaration that the defendant was not entitled to drain his premises through the plaintiff's premises, and an order for removal of the connection. The defendant contended that his two houses were two buildings within the meaning of the Public Health Act, 1875, and therefore that, from the point of junction of the pipes from the houses to the sewer, the conduit was itself a "sewer" within the meaning of the Act, and that, being a sewer, it was now vested in the local authority. The plaintiff, on the contrary, argued that the two houses were only one building, and that the conduit was only a drain; but that, whether it was a sewer or a drain, the defendant could not by what was a trespass and an unlawful act deprive the plaintiff of his rights in his own land. Mr. Justice Cozens-Hardy, in delivering judgment, said that a structure might be one building whether it was occupied by one or more person or persons, and whether in flats or not. The term "one building" was not equivalent to the term "one house." A pair of semi-detached houses might be one building only. In *Kershaw* v. *Taylor* (1895, 2 Q.B., 208, 471) a Divisional Court held that from the point of junction the culvert was a sewer and not a drain within the Metropolis Local Management Act, 1855, but there the drainage came from two separate pairs of semi-detached houses. In *Travis* v. *Uttley* (1894, 1 Q.B., 233) it was held that a pipe receiving the drainage of more than one "building" was a sewer within the meaning of the Public Health Act; but in the present case the erection was only one building, although it consisted of two semi-detached houses, and this culvert, so far as it ran through the plaintiff's land, was not a sewer. But even if it was a sewer there would be a further difficulty. Could a man by making a culvert wrongfully on another man's land without his consent make it a sewer so as to vest it in the local authority and divert the property from the owner of the land? The observations of Mr. Justice Chitty and the Court of Appeal in *Meader* v. *West Cowes Local Board* (1892, 3 Ch, 18) were against the defendant on this point. Webb could not by a trespass on the plaintiff's own land make something a sewer so as to prejudice the plaintiff. His Lordship then disposed of other defences raised by the defendant, made a declaration that the defendant was not entitled to drain through plaintiff's premises, and ordered the defendant to take up and remove the drain complained of.

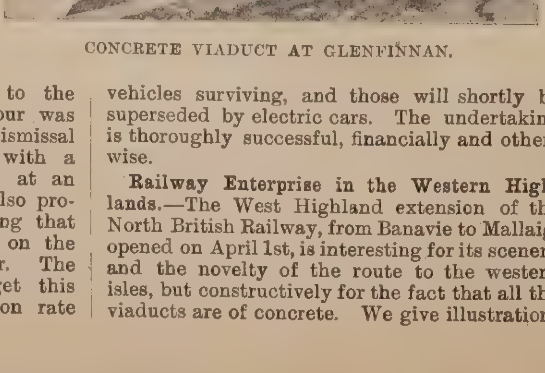
Union Labourers' Action against Builders.—The cases of *Powell* v. *Hanscomb and Smith* and *Purkiss* v. *Hanscomb and Smith* was heard at the Croydon County Court on March 26th. The plaintiffs, who are bricklayers' labourers belonging to the United Labourers' Union, sued the defendant builders (carrying on business at Croydon) for the difference in wages paid at 6½d. per hour and 7d. per hour. Mr. Gardner (instructed by their Union) appeared for the plaintiffs, and the defendants were represented by Dr. Newnham, LL.D., under instructions from the Croydon and District Master Builders' Federation. It appeared that Powell had been engaged on the defendants' works for two weeks and one day, and Purkiss for a few days only, both the men being started by the foreman of works without any specific agreement as to the wages paid. The foreman gave evidence to the effect that the only time 7d. per hour was mentioned by the plaintiffs before dismissal was when Powell approached him with a view to taking over the scaffolding at an increased rate of ½d. per hour; he also produced defendants' wages-book, showing that the whole of the remaining labourers on the works were receiving 6½d. per hour. The plaintiffs' solicitor endeavoured to get this witness to admit that the London Union rate of 7d. per hour was generally paid in Croydon on account of the town coming within the twelve miles' radius, as fixed by the London Master Builder's Association and the workmen's unions; but the witness stated that after many years' experience in the capacity of builder's foreman for the largest firms in the town, he had never known a labourer's wage to be more than 6½d. per hour. Messrs. S. Page and D. Waller, builders, of Croydon, and Mr. E. J. Fairchild, secretary to the Federation, gave evidence as to the trade custom of engagement and payment, and also to prove that the beforementioned arrangement as to the radius had never been acknowledged by the Croydon builders, who have an entirely independent organisation, comprising all the most important firms in the district, and whose maximum rate of wage for all trades has always been ½d. per hour less than the London Union rate. The names of John Tidy and Messrs. Wenham and Waters were put forward by the plaintiffs' solicitor as firms for whom Powell had previously worked at the higher rate, but the first was proved to be a piecework bricklayer or sub-contractor, and the others the well-known firm of electrical engineers. His Honour (Judge Russell) held that Powell, from the fact that he worked at the lower rate after receiving his wages the first week, had in effect agreed to it, and because both he and Purkiss had not enquired as to the rate paid in the works they were therefore employed by the foreman in accordance with the usual custom, and entitled to the same rate of payment as other labourers in the district, which he held the evidence had conclusively proved to be 6½d. per hour. He therefore gave judgment for the defendants in both cases. The defendants' solicitor stated his clients did not ask for costs.

Engineering Notes.

The Fylde Joint Hospital, near Lytham, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves and grates, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

London Water Supply.—In their report on the composition of the water supplied to London during February, Sir William Crookes and Professor Dewar state that all the 184 samples examined were found to be clear, bright and well filtered.

Liverpool Electric Tramways.—The Liverpool Corporation have now 269 electric cars on the city streets (worked on the trolley system with overhead wires), only seventeen horse vehicles surviving, and those will shortly be superseded by electric cars. The undertaking is thoroughly successful, financially and otherwise.



CONCRETE VIADUCT AT GLENFINNAN.

Railway Enterprise in the Western Highlands.—The West Highland extension of the North British Railway, from Banavie to Mallaig, opened on April 1st, is interesting for its scenery and the novelty of the route to the western isles, but constructively for the fact that all the viaducts are of concrete. We give illustrations of the concrete viaduct at Glenfinnan, and o the destination of the line, Mallaig itself. It i expected that there will be a heavy touris traffic this season over the new line, the scener from which is wonderfully fine.

NORTH BRITISH RAILWAY EXTENSION: MALLAIG.

Widening of London Bridge.—The preambl of the Bill for widening London Bridge wa passed last week and ordered to be reported t the House for third reading.

New Graving Dock for Liverpool.—Subjec to confirmation this week, the Mersey Dock and Harbour Board have decided to construc a new graving dock on the site of the Soutl Carriers' Dock, at an estimated cost o £136,000.

Bournemouth's Pavilion Scheme.—After recently rejecting a scheme to erect a pavilion a the shore end of the pier at a cost of £40,000 the Bournemouth Town Council are favourabl considering a committee's recommendation t build a pavilion or shelter at a cost of £15,000 The surveyor has been instructed to prepar plans, &c., for a pavilion to cost £25,000. Bu matters are far from settled yet.

Bridging the Wansbeck.—We understan that Messrs. Deuchar and Son, of Newcastle have offered to contribute the sum of £1,00 towards the cost of building a bridge over th Wansbeck at Stakeford, one of the most dangerous of the fords on the Wansbeck, and the scen of numerous dangerous accidents. Messrs. Balfour and Son, engineers, of Newcastle, estimat the cost of a bridge from Snowdon's bank a the Stakeford side to the Station Bank at North Seaton at £10,000.

Dock Building in the Bristol Channel.—Very remarkable enterprise is being shown at the Bristol Channel ports in dock building. At Cardiff and Llanelly there are docks under construction costing £1,500,000 and £200,000 respectively, and from Bristol, Swansea and Newport bills have been promoted for extensions costing £1,800,000, £1,750,000 and £750,000. All this is in addition to six undertakings of the same kind finished within the last thirteen years, and it will bring up the recent expenditure at Bristol Channel ports to close upon £12,000,000.

North-Western Railway Extensions.—Great works are now in hand on various parts of the North-Western railway system. The new station at Lancaster is being pushed forward with energy by the contractors, and by the time that the passenger season is well advanced it will be ready to ease the congestion somewhat, although it is impossible for it to be by any means complete. The Crewe works are all but finished underground, and when the works in connection with the reconstruction of the station get well in hand there will be the manifest beginning of a tremendous change in that famous centre. At the London end the demolition of Park Village will effect no slight alteration, and the provision of extra lines (four it is stated) from Chalk Farm into Euston will greatly facilitate the traffic management. The erection of the new hotel and the extension of Euston Station into the Euston Road are matters which the directors are keeping back for the present, as well as the Shap widening and new works. But postponed does not mean forgotten or given up.

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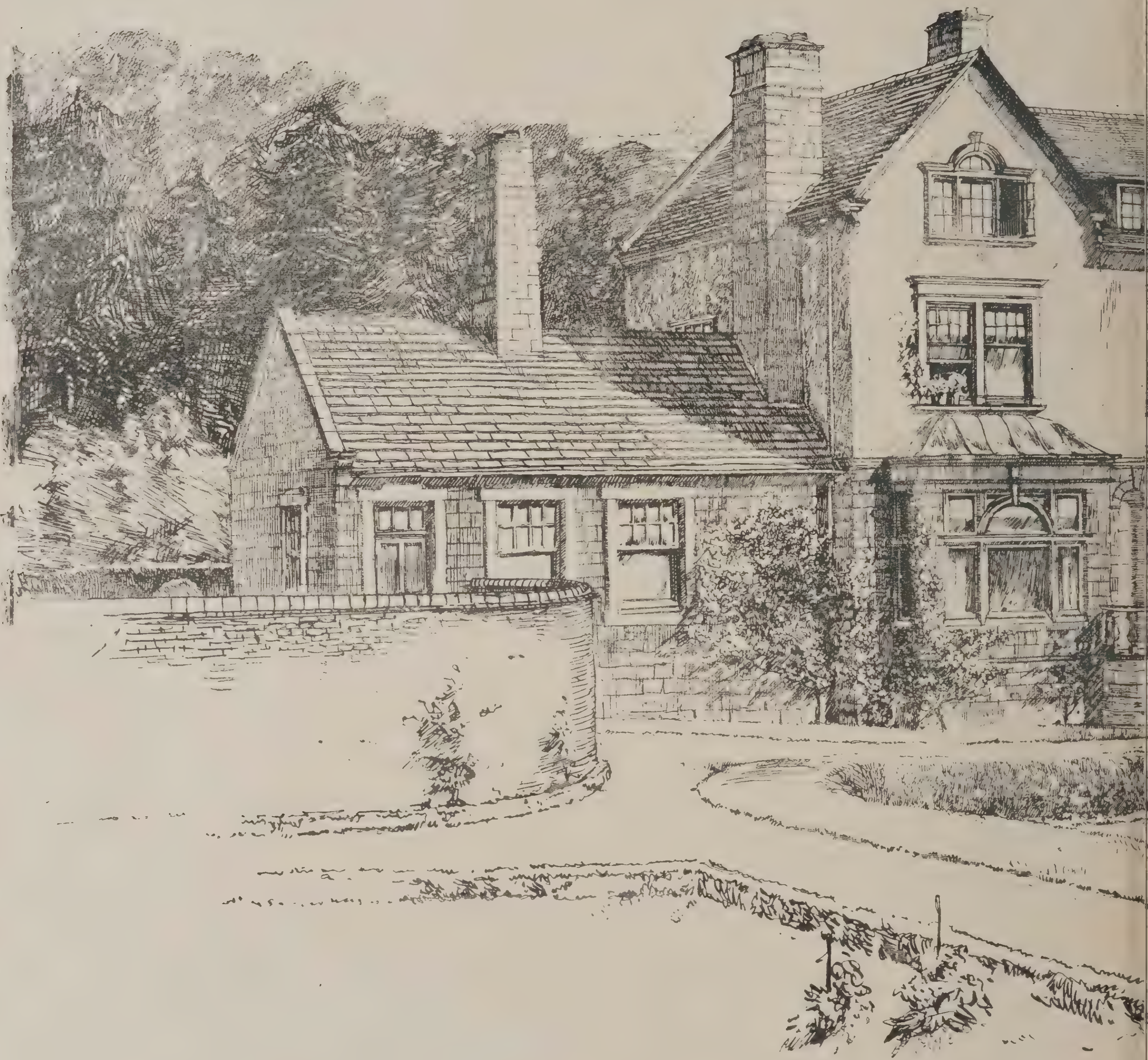
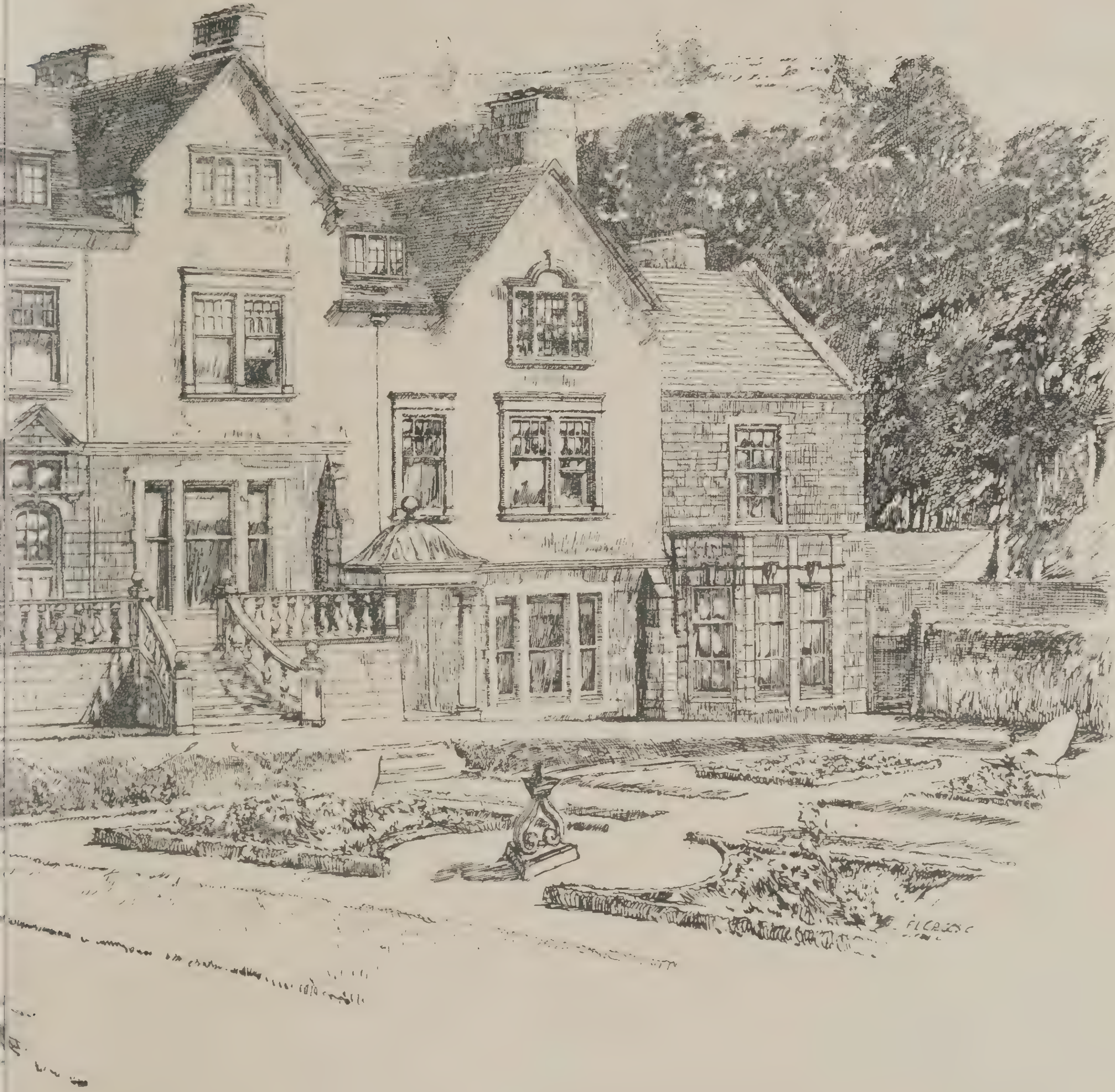


WEETWOOD GARTH, NEAR LEEDS. W



IAM H. THORP, F.R.I.B.A., Architect.

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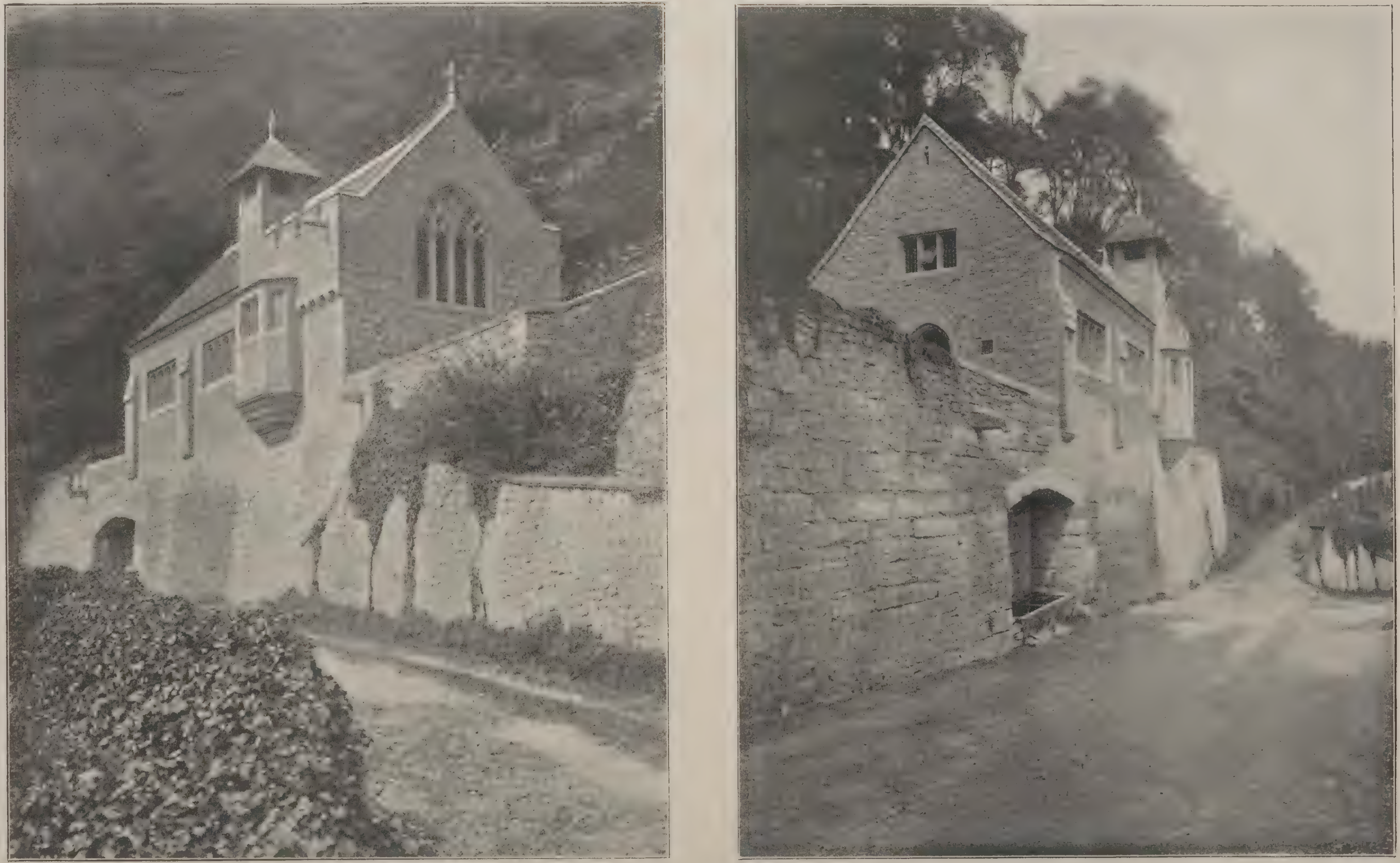

MATLOCK CHAPEL, DERBYSHIRE. E. GUY DAWBER, Architect.

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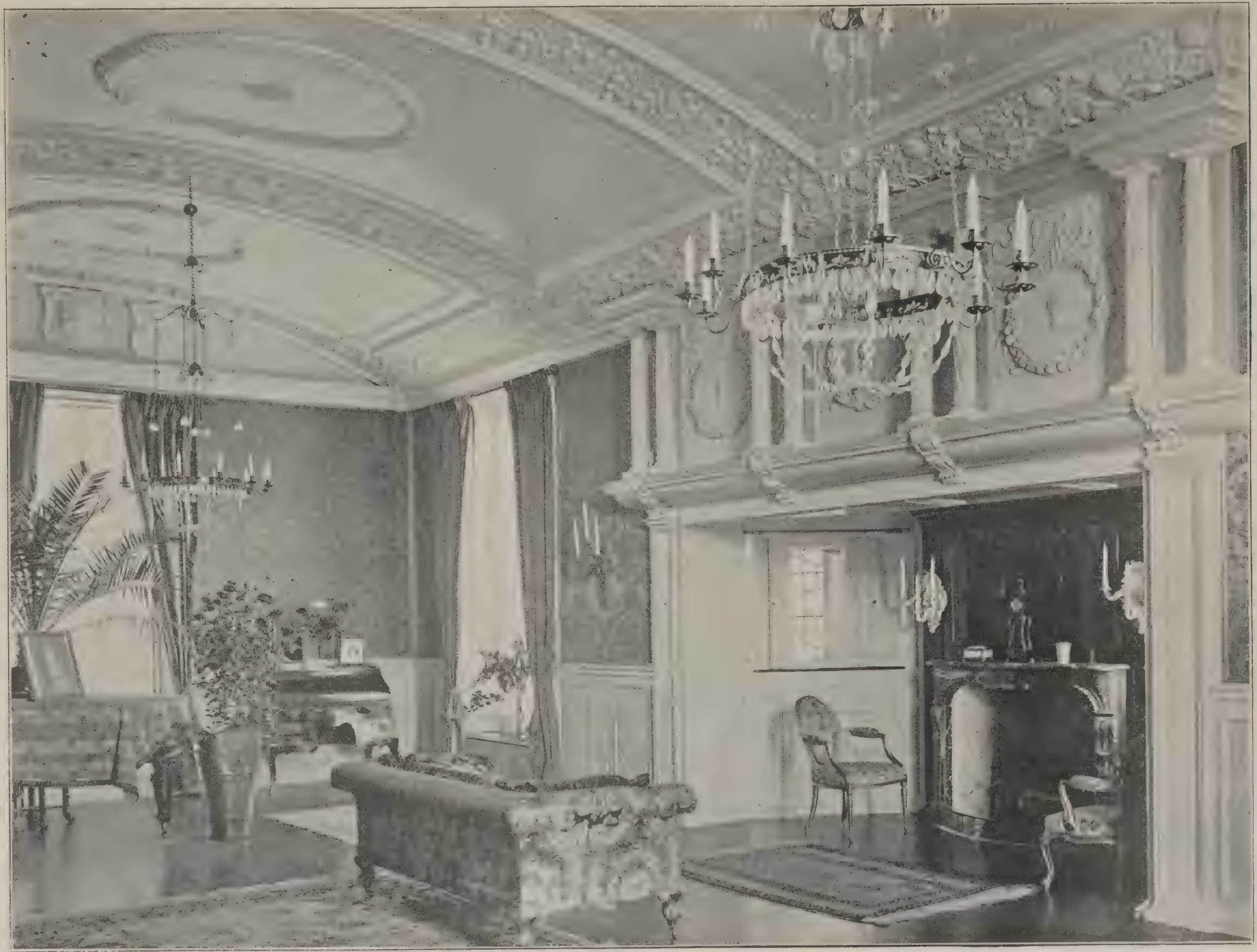

THE DRAWING-ROOM, "HARTPURY," GLOUCESTERSHIRE. E. GUY DAWBER, Architect. Modelled Plasterwork by GEORGE P. BANKART.

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Bricks and Mortar.

Aphorism for the Week.

"*Never build after you are five-and-forty; have five years' income in hand beofre you lay a brick; and always calculate the expense at double the estimate.*"—Kett.

Our Plates. Particulars of St. John's Chapel, Matlock Dale, and of the drawing-room at Hartpury, Gloucestershire, will be found in the article on the work of Mr. E. Guy Dawber, which begins on page 148 of this issue.—The houses at Weetwood, near Leeds, known by the name of Weetwood Garth, have been erected on the site of an old house that has been pulled down, and of which a small portion of more modern construction has been incorporated with the new building. It will be noticed that the houses are built on two different levels, the further one, which retains a portion of the old building, being the lower of the two. The ground-floor storeys are built of local hammer-dressed stone, and the upper storeys are covered with rough-cast, the woodwork of cornices and window framing, gables, &c., being painted a willow shade of green. The roofs are boarded and felted, and are covered with Yorkshire stone slates, which are largely used on old houses in the neighbourhood. The houses were built for George William Brown, Esq., of Belsize Park Gardens, Hampstead, London, from the designs and under the superintendence of Mr. William H. Thorp, F.R.I.B.A., of 61 Albion Street, Leeds.

Model Villages. Mr. George Cadbury, of Northfield, Worcestershire, has given to Birmingham a residential estate at Bournville, four miles from the centre of Birmingham, consisting of 330 acres, of which about one-third has been laid out. Upon this 370 cottages have been built. Of these 143 have been sold at cost price on leases of 999 years, 3 per cent. being charged to those who paid less than half of the cost, and 2½ per cent. to those who paid at least half the cost. The remaining 227 cottages and shops are let to weekly tenants, and the rents of these, ground rents, &c., are paid into the trust. There are about 200 allotments, which are in much demand from the inhabitants of the adjacent manufacturing villages. The total rent roll, exclusive of repayment for cottages sold, is £5,246 a year, which, after current expenses are paid, is to be devoted to the development of the estate and the building of more cottages. The value of the estate is estimated at between £170,000 and £180,000. Mr. Cadbury's main object is to secure the erection of sanitary and healthful dwellings for the working classes and labouring population without any chance of overcrowding, and so arranged that the residents shall be sure of fresh air, country surroundings, and an abundance of open space. When this estate is completed it is intended, with the income from it, to purchase similar estates, but the intention of the founder is that such estates may be developed as manufacturing centres, one-fifteenth only to be used for manufactories, one-tenth at least to be used for open spaces, and the remainder, as on the Bournville estate, to be laid out for cottages and gardens, the buildings not to cover more than one-fourth of the land on which they are erected.

A Model Trade School. In New York there is a model trade school which was erected at a cost of £34,000 by the munificence of the Baroness de Hirsch. It is so designed that 120 pupils can be graduated yearly. The aim of the school is to fit young men, not under sixteen years of age, to enter one of the mechanical trades as a means of livelihood, and this object is attained in a course of five and a-half months. The time devoted to the course may at first sight seem rather short; but it has been fixed after careful consideration. The trade courses are in carpentry, plumbing, sign-painting, house-painting, machinery, and electrical work. Instruction in geometrical and mechanical drawing is given to all the pupils, practical problems being given them to solve, and a series of drawings being made from models showing the principles on which working drawings are constructed. As a result of the work there have been many cases of marked success. Out of 272 graduates of eight classes, 188, or 69 per cent., reported their occupations at certain periods ranging from six months to two and a-half years after graduation. Of this number 145, or 77 per cent., were working at the trade learned in the school, and the remainder, or 23 per cent., were engaged in other occupations. It is reasonable to suppose that the same proportion holds good for the eighty-four graduates from whom a report had not been received. Taking the average wages received by members of these classes at the commencement of their employment the amount was 19s. 6d. per week, and when they were last heard from was £1 9s. 9d. per week, a gain of 53 per cent. in an average length of time of seventeen months. It is found from reports received from employers who have been communicated with that they find it pays better to employ boys trained at the Hirsch Institute than to endeavour to train them themselves.

To Improve Paris. A notable scheme for improving the Champs de Mars has been laid before the Paris authorities by M. Bouvard, the municipal functionary whose special province is street improvements, and who is showing himself by his energy and initiative a worthy successor of that great reformer M. Alphand. As every tourist is aware, the Champ de Mars, the site of the Eiffel Tower, is a vast open space stretching from the Seine to the Ecole Militaire. Except when an exhibition is in progress, it is somewhat of a No Man's Land, almost a stretch of waste ground, kept up in perfunctory fashion and destitute in the main of attractiveness. M. Bouvard proposes to convert it into a park and model public promenade. A lake will occupy the centre, and plantations and lawns will make the spot the rival of the Champs Elysées. The scheme further provides for the demolition of the familiar Galerie des Machines, which, though a triumph of engineering skill, is a desperately ugly edifice. The removal of this monster, and in some respects monstrous iron construction, will open up the Ecole Militaire, which will become visible from the Trocadéro. The Ecole Militaire, designed by the famous architect Gabriel, certainly deserves a better fate than to be hidden away behind the gigantic girders of the Galerie des Machines. But the crowning advantage of M. Bouvard's project is that it would be most profitable to the city of Paris. A strip of land on either side of the Champs de Mars is to be sold for building purposes, it being stipulated that the houses to be erected shall be mansions standing in their own grounds. The money that would be obtained in this way is estimated at nearly a half a million sterling, and would leave a very handsome balance after the park had been created, the total outlay on which is not expected to exceed £40,000.

Churches for Men, not Men for Churches. Preaching in Carlisle Cathedral recently on clerical incomes, Archdeacon Diggle said: "No community of Christians makes such scant sacrifices for its ministers as the Church of England. The laity are indeed sometimes munificent in other directions. They build churches, supply organs, put in stained-glass windows, but they do not equitably remunerate the clergy. Yet the Church needs men more than buildings, spiritual and intellectual lights more than windows, however beautiful. Christ built no churches. He commissioned men. We begin at the wrong end. In new parishes we build the church and starve the man. We ought first to endow the man, then build and beautify the Church."

M. de Morgan's Discoveries. The publication by the French Government of the first memoir by M. de Morgan on his recent explorations at Susa has marked an epoch in Oriental archæology. For about five years the expedition of which he was the head has been engaged on the site of the ancient Persian capital, and the results have far exceeded the expectations which had been formed. The work of former explorers had been hitherto confined to the larger of the two tumuli at Shastu, the modern name of the locality. Here Mr. Kenneth Loftus in 1851 and M. Dienlafoy in 1887 found the remains of the *apadanas*, or coloured halls in the palaces of Darius Hystaspes and Artaxerxes; and M. Dienlafoy obtained the fine series of sculptures which now adorn the Susanian rooms in the Louvre. It was evident that the smaller or western mound marked the site of the older city destroyed by Asurbanipal 640 B.C. The attention of the recent expedition was accordingly directed to this spot.

Buried Cities. Traces of no less than five distinct settlements have been found on the site. Commencing from the upper part, we have first a Græco-Parthian layer of remains, dating about B.C. 300—200; below this the remains of the Persian Achæmenian settlement, B.C. 500—300: and beneath this again, the older city, almost wholly destroyed in 640 B.C. These explorations reveal the important fact that, though the city was pillaged, burned with fire, and the palaces wrecked by Asurbanipal in his terrible campaign of vengence, it was, nevertheless, not totally destroyed; and there was found among the *débris* a cylinder of Nebuchadnezzar the Great, which shows that the city was occupied during the time of the Jewish Captivity, and that it is quite possible Daniel may have visited it. The city which was destroyed by the Assyrians probably dates from about B.C. 1800, as bricks of the Kassite rulers of Babylonia were discovered there. M. de Morgan has not yet worked up all the material he has obtained, but he is to be congratulated on having achieved one of the most important works of Oriental exploration of recent years.

Sussex Fonts. Mr. Lewis Andre was recently speaking about the fonts of Sussex before the county archæological society. He remarked that a feature of the fonts is that, while a church may have been entirely rebuilt the font has been almost invariably retained. Mr. Andre commented on the absence of Norman fonts in Sussex, and said that examples of sculptural work are extremely rare on Sussex fonts; the only one bearing groups, or even single figures, is at Brighton. Foliage work is to be seen at Bury, Etchingham and Mountfield, and animals at Salehurst and Slaugham, while at Denton and Lewes there are fonts with basket-work ornamentation. One at Yapton has crosses. Emblems of the Passion are to be seen at St. Clement, Hastings, and heraldry at Burwash and Mountfield.

Rosendale Hall, Dulwich. Rosendale Hall, at the junction of the New Clive Road, Dulwich, is fast disappearing under the hand of the destroyer. Over the gateway was the date 1658, but there were evidences of older date inside. Lord Chancellor Thurlow, it seems, made it his residence for some time, and it was he—somewhere about 1780—who made many structural alterations in the house, and left it much as it was in our day. In 1658, two years before the restoration of King Charles II., Dulwich was far away in the country and stood in the great woodland which extended as far as Croydon. Not so many years ago extensive stables and dog kennels were standing near the house. One of the local archæologists, who was fortunate enough to obtain permission to go over the old place before it was handed over to destruction, says that the interior was full of roomy cupboards and closets built in the thicknesses of the lower walls, and that the kitchen was ample and quite "baronial," with a paved floor and a fireplace which until recently displayed an ancient turnspit. Rosendale had eighteen rooms, some of fine proportions, and one of the finest and quaintest was known as the "King's bedroom"—Charles II.'s room when he came a-hunting. From the quaint hall rose a fine oak staircase, and in some of the upstairs rooms was some good early furniture.

MOVABLE FLOORS FOR PUBLIC BATHS.

BY EDWIN B. B. NEWTON, F.S.I.,
ASSOC.M.INST.C.E.

IN view of comparatively recent legislative changes, the question of providing in public baths, floors which can be erected over the large swimming ponds, after the summer season has ended, is one which is likely to continue to engage the attention of municipal surveyors and architects.

Section 5 of the Baths and Wash-houses Act of 1878 gave power to commissioners of baths to close from November to March any covered or open swimming bath, and to use the covered space for the purposes of a gymnasium, for other means of healthful recreation, for holding vestry meetings, or for other parochial purposes, but it contained a proviso to the effect that the covered space should not be used for music or dancing.

As is well known, in the majority of cases public baths are not carried on at a profit, as the swimming baths (the preparation and upkeep of which are always costly) are, if open, little patronised during the winter, so that the revenue from them is correspondingly small. In the alternative the section above referred to did not allow the baths, when closed, to be made very remunerative. Accordingly, with the view of lightening the burden on the rates, an Act, applying to London only, was passed in 1896 permitting under certain conditions closed baths, when structurally fit, to be used for music and dancing, and in 1899 a similar power was given in respect of baths in the provinces.

Advantage has been taken of the powers given by these two Acts in many cases, and in almost all it has been, and will be, necessary, for the purpose of making use of the baths for entertainments, &c., to construct floors over the swimming ponds.

Being of a temporary nature only, though likely to be subjected to the burden of heavy loads, it is essential that the floor shall be as light as is consistent with adequate strength and be capable of being easily and quickly fixed, and taken up and packed away in as small a compass as possible. The various parts should therefore be of moderate dimensions and light weight. Fixed frames should be avoided, and the whole made to take apart in single pieces.

The verge of the pond is generally as shown in Fig. 1. The floor may be brought to the nosing with its surface level with that of the verge, or fixed with its surface higher, so as to rest upon the verge and be continued to the dressing-boxes or the main wall, accordingly as the dressing-boxes are fixed or removable.

If the surfaces of the floor and the verge are to be continuous, the gutter around the pond must be filled up in some manner, e.g., with cement, which has subsequently to be chipped out. But there are many disadvantages attached to this plan; the floor and verge are not of the same material, the slate or other verge is often cold, cheerless and sometimes slippery, while considerable difficulty is at first experienced, by reason of the shrinkage occurring, in refitting the floor boards inside the rounded ends of the pond.

It is better, therefore, to cover the whole, or the greatest possible, area of the bath-house with the floor.

A typical swimming-bath house is shown by full lines in Fig. 2, the dotted lines indicating the floor and its supports. It will be found convenient to support the floor boards upon frames about 5ft. or 6ft. apart—in the example shown 5ft. centre to centre.

A section through the above bath-house would then be as at Fig. 3. The floor boards over the verge should be supported on battens, say 4in. by $1\frac{1}{2}$in. (the thickness depending upon the amount of fall in the bath verge), scribed to the floor so as to present a level surface for the reception of the floor boards. One of these battens should run along the foot of the dressing-boxes, another along the edge of the pond (this one may need to be wider than 4in. in order to cover the gutter), and one should be fixed upon the verge at the end of the bath in continuation of each of the framed supports in the pond. The floor boards should be supported on a headpiece, which in its turn rests upon posts framed into a sleeper or sill lying upon the pond floor. These will be dealt with in turn.

Flooring Battens.

Taking into consideration weight, strength and cost, the most suitable wood for these and the whole of the framing will usually be found to be yellow deal. Under the regulations of the London County Council a space of 20in. by 28in. must be provided for every person in addition to gangways, &c., but in view of contingencies and the possibility of a packed public meeting an allowance should be made for a dense crowd. Assume a load per square foot of 120lb., and consider a strip of floor 12in. wide. Neglecting the width of the frames upon which the floor rests, and which are assumed to be 5ft. apart centre to centre, the live load would be $120 \times 5 \times 1 = 600$lb., equivalent to an ultimate load of 6,000lb., allowing a factor of safety of 10. Assuming the thickness of the floor to be $2\frac{1}{2}$in. and the weight per cubic foot of yellow deal to be 36lb., the dead load would be $\frac{2\frac{1}{2}}{12} \times 36 \times 5 \times 1 = 37\frac{1}{2}$lb., equivalent to an ultimate load of 262lb., assuming a factor of safety of 7. The floor must be assumed to be supported on the frames, not *fixed* to them, as the short screws used for the latter purpose are incapable of putting the floor battens into the condition of being fixed beams. The greatest bending stress would therefore be for a uniform load $\frac{Wl}{8}$, where W = the total load and l the span in inches. Taking the ultimate resistance to bending stress of yellow deal to be 6,000lb. per sq. in., the moment of resistance of the 12in. strip is $\frac{6000 \times bd^2}{6}$, so that

$$\frac{6000 \times bd^2}{6} = \frac{Wl}{8}$$

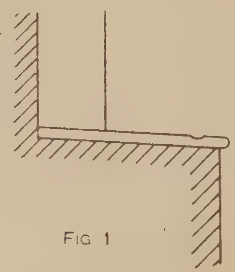


FIG 1

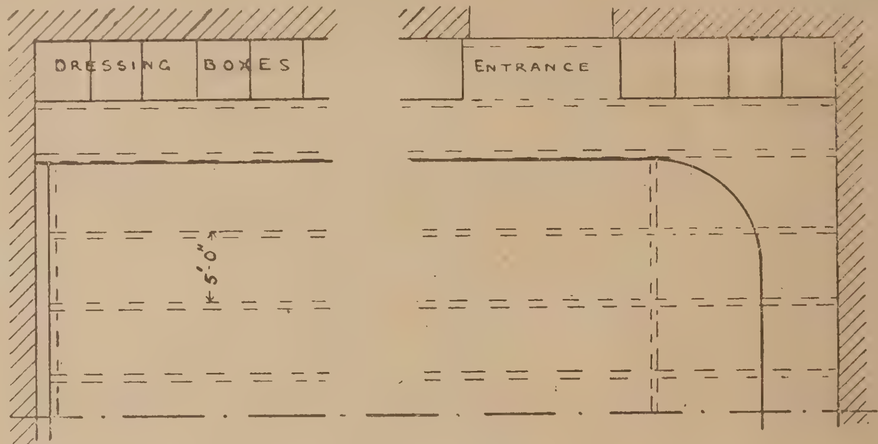


FIG. 2

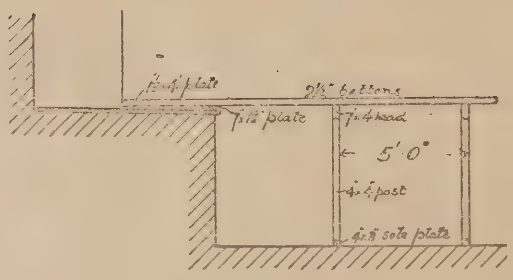


FIG. 3

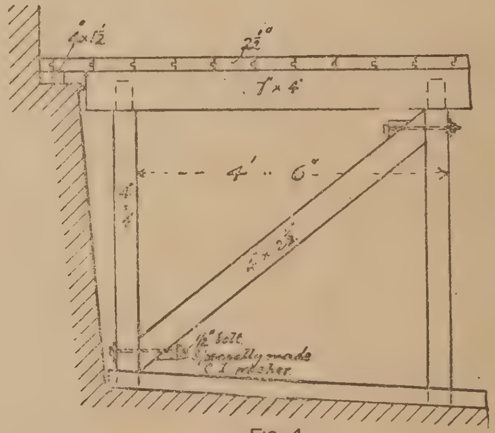


FIG. 4

MOVABLE FLOORS FOR PUBLIC BATHS: CONSTRUCTIONAL DETAILS.

or $$\frac{6000 \times 12 \times d^2}{6} = \frac{(6000 + 262) \times 60}{8}$$
whence $d^2 = 3{\cdot}9137$ and $d = 1{\cdot}98$in.

Considering the slight weakening by the tongued and grooved joint, the finishing of the floor and the fact that any defect greatly affects the strength of thin stuff, a 2½in. batten will be advisable and a width of 7in. probably the most convenient one, as with narrower, and consequently more, battens the labour of fixing is increased. Where evenness of floor surface is unimportant, wider boards may with advantage be used.

The deflection, though in this case unimportant, may shortly be investigated. Its amount is given by using the formula,

$$\Delta = \frac{12n \; Wl^3}{E \; bd^3};$$

n being a constant, which for beams supported at each end and uniformly loaded is $\frac{5}{384}$; W the total load; l, b and d the length, breadth and depth respectively of the beam; and E the modulus of elasticity. The total equivalent dead load is $(2 \times 600) + 37\tfrac{1}{2} = 1237\tfrac{1}{2}$ lb. Then substituting,

$$\Delta = \frac{12 \times 5 \times 1237\tfrac{1}{2} \times 60 \times 60 \times 60}{384 \times 1440000 \times 12 \times 2\tfrac{1}{2} \times 2\tfrac{1}{2} \times 2\tfrac{1}{2}} = {\cdot}155\text{in.}$$

The limit for a floor without a ceiling underneath is usually considered to be about $\frac{1}{30}$in. per foot of span, or in this case ·167; so that the floor is amply stiff enough.

Each batten should be tongued and grooved and secured to its bearer by a 3½in. screw at a point close to its grooved edge, and particular care should be exercised to ensure that every screw before insertion has been thoroughly well greased, or great difficulty in unscrewing will be experienced when the floor needs to be removed. The length of the floor boards may conveniently be from 15ft. to 20ft., care being taken to break joint as much as possible. The weight of a batten 20ft. long, 7in. wide, and 2½in. thick is about 80lb.

Headpiece.

This should be supported upon posts about 4ft. 6in. apart, centre to centre, so that the load upon a single span will be 120lb. per square foot over an area of 4½ft. by 5ft. for live load, plus the weight of the floor boards. The former will amount to 2,700lb., equivalent to 27,000lb. as an ultimate load, allowing a factor of safety of 10. The weight of the floor boards, assuming the weight per cubic foot of yellow deal to be 36lb., will be $4\tfrac{1}{2} \times 5 \times \frac{2\frac{1}{2}}{12} \times 36$, or 168·75lb., equivalent to, say 1,200lb. as an ultimate load, allowing a factor of safety of 7. These two loads together amount to 28,200lb. The beam would be most severely strained if in the condition of a supported beam fully loaded over its whole span, and assuming this to be the case the greatest bending moment is for a uniform load $\frac{Wl}{8}$ and the moment of resistance $\frac{6000 \times bd^2}{6}$.

Then
$$\frac{Wl}{8} = \frac{6000 \times bd^2}{6} \text{ or } \frac{48 \times 28{,}200}{8} = \frac{6000 \times bd^2}{6}$$
whence $bd^2 = 169{\cdot}2$.

Taking b as 4in., $d^2 = 42{\cdot}30$, whence $d = 6{\cdot}5$.

The section of the headpiece should therefore be 4in. wide and 7in. deep.

The defection is then in amount:—

$$\frac{12 \times \frac{5}{384} \times 2868\tfrac{3}{4} \times 54 \times 54 \times 54}{1440000 \times 4 \times 7 \times 7 \times 7}$$
$= {\cdot}14$in., which is not at all a large amount.

A 4in. by 7in. section is therefore amply strong and a convenient length for the headpiece would be about 20ft., as the weight of such a scantling would be about 140lb., easily carried by two men.

The question of the joint between two lengths of the headpiece will be considered with that of the joint between the head and the post.

Post.

The load upon each post will equal that upon the headpiece, namely, 28,200lb. ultimate.

The formulæ for the calculation of the strength of wooden struts give somewhat different results, so that it will be useful to compare two of them. The greatest length of any post will probably be about 96in.

Assume a post with a section of 4½in. by 3in.

By Gordon's formula the total load the post will resist, taking the safe resistance to compression as 6,000lb. per square inch and assuming both ends to be fixed, is

$$\frac{4\frac{1}{2} \times 3 \times 6000}{1 + \frac{1}{250} \times \frac{96 \times 96}{3 \times 3}} = \frac{27 \times 3000}{1 + 4{\cdot}096} = \frac{81000}{5{\cdot}096} = 15{,}895\text{lb.}$$

By Mr. Stoney's table the ratio of the length of the post to its shortest side being as 96 : 3, i.e. 32 : 1 for yellow pine, the breaking weight per square inch of section would be $\frac{87{\cdot}15}{144}$ tons, or $\frac{87{\cdot}15 \times 2240}{144}$lb.

The compressive strength of yellow deal compared with yellow pine being as 3 : 2, the above breaking-weight would be $\frac{87{\cdot}15 \times 2240}{144} \times \frac{3}{2}$ for yellow deal, and the total breaking-weight for the section 4½in. by 3in., $\frac{87{\cdot}15 \times 2240}{144} \times \frac{3}{2} \times \frac{9}{2} \times 3 = 27{,}452$lb.

If the length of the strut be reduced from 96in. to 72in. its strength would be, according to the above formulæ, 24,500lb. and 32,288lb. respectively.

The strength of the 4½in. by 3in. post is therefore, according to Gordon's formula, much less than is necessary, and according to Mr. Stoney's table a little less than sufficient. Taking into consideration the fact that the weights and costs of posts respectively 4in. square and 4in. by 3in., are proportionate to the sectional areas of the posts, namely, 16 to

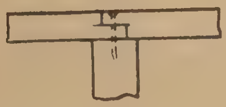


FIG 5

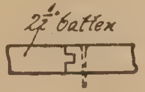


FIG. 6

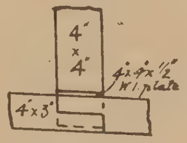


FIG 9

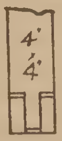


FIG. 10

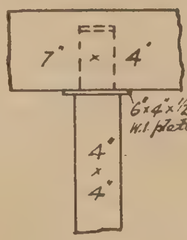


FIG. 7

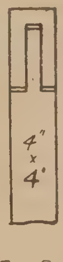


FIG. 8

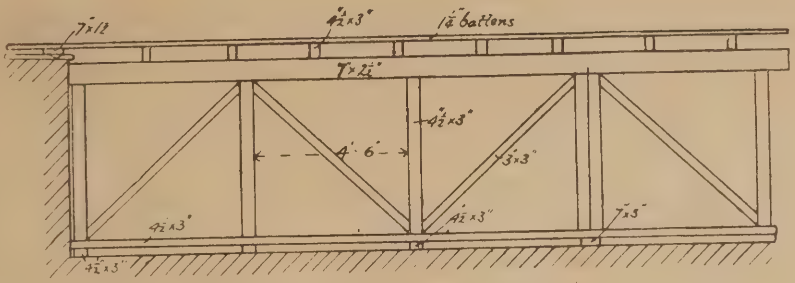


FIG 11

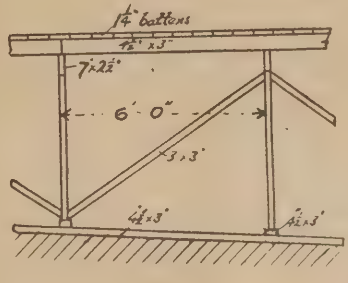


FIG. 12

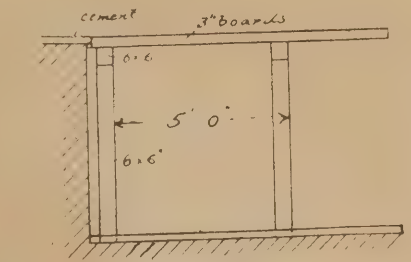


FIG 13

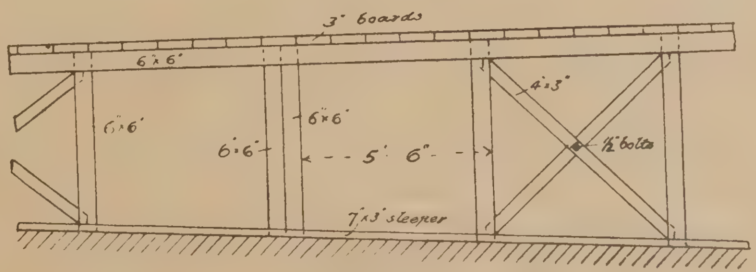


FIG 14

MOVABLE FLOORS FOR PUBLIC BATHS: CONSTRUCTIONAL DETAILS.

14, while the strength of the former calculated by Gordon's and Stoney's rules is 29,056lb. and 38,266lb. respectively and its section is much better adapted for bearing surfaces and connections, the advantage of using a post 4in. square is manifest.

Diagonal Struts.

As the floor battens have their sides and ends firmly fixed against the walls or boxes of the baths and are screwed to the framework, the bottom piece or sole-plate of which is firmly wedged against the sides and ends of the bath by means of 3in. square sleepers, there is no necessity for any diagonal struts, provided the timber is well seasoned, as in that case the shrinkage in the direction of the grain, of the floor battens across and of the framing along the bath, will be so small as not to affect the stability of the posts. If, however, the framework cannot be satisfactorily wedged up against the ends of the baths, to prevent rocking, a strut of 4½in. by 2¼in. stuff, or similar size, may be fixed as shown in Fig. 4. On no account should the strut be cut into, in order to dispense with the purpose-made cast-iron washer, and yet provide a square bearing for the nut, as in screwing up the latter there is a great risk of the portion between the cut and the end of the strut being sheared off.

Sole Plate.

The sole plate may be 4in. wide and 3in. thick, scribed where necessary to the floor of the bath and prevented from slipping laterally by struts of stuff 3in. square laid between the frames and between a frame and the side of the bath, and wedged tight.

Joints: Floor Boards.

The heading joints of the floor boards should be as shown in Fig. 5, and the edge joints as shown in Fig. 6. A screw should be fixed in each batten, about 1in. from the end of the tongue, as by placing it in this position the evenness of the floor is better ensured.

Head Pieces.

Assuming a $1\frac{3}{8} \times 5$in. tenon on the post, the mortise would weaken the head by about 8in., allowing for the mortise bearing on the shoulders, not on the tenon. Deducting 8 from the 28 sq. in. sectional area of the headpiece leaves 20 sq. in. to bear the shearing stress due to half the total ultimate breaking load of 28,200 lbs, equal to $\frac{14,100}{20} = 705$ lb. per sq. in., which is well within the limit, across the fibres. To distribute the load evenly over the top of the post a short cast-iron bearing-plate, say 6in. by 4in. by ½in., may with advantage be used, and the tenon on the post may also be made 3in wide. The bearing area is $(4 \times 4 - 3 \times 1\frac{3}{8})$ or $11\frac{7}{8}$in., and taking the ultimate resistance to compression at 6,000 lb. per sq. in. the total crushing load is 71,250 lb., which is two and a half times as much as the load upon the post, i.e. 28,200 lb. (ultimate).

The joint may therefore conveniently be as shown in Figs. 7 and 8.

The joint between the post and the sole-plate should be as shown in Figs. 9 and 10.

Trap Door.

It will be necessary to have a means of access to the spaces under the floor when this is in position, as these may often be used as storage places for chairs, &c. About 4ft. by 30in. square in the clear will usually be found sufficient for its size, and it may be formed as a loose lifting slab or hinged with a lock, though if the latter be fixed a dust-plate must be provided over the key-hole and all metalwork finished flush with the surface of the floor. The hinges should be strong and of the back-counter type. The lifting ring should, when released, fall flush with the surface of the door. The ledges may be two in number, and of 4in. by 3in. stuff, while the trimmers should be of about the same size and tenoned into the headpieces so as to weaken it as little as possible.

The position of the trap door will depend upon circumstances. If long articles are intended to be placed through it under the floor it must be arranged at such a distance from the end walls as to allow this. On the other hand, if the floor is likely to be used for dancing or the trap door for the storage of stage requisites, it may be better if placed close to an end wall.

Sloped Slabs.

As the movable floor is about 3½in. above the level of the permanent one, it will be necessary to provide sloped slabs from the line of the front of the dressing-boxes up or down to higher or lower floors, as the case may be, by means of which access is obtained to the bath. To get to a lower level the battens forming the slab should be splayed down to about 1in. at the doorway, supported there by a wrought-iron bar, and at their junction with the movable floor by a 1½in. splayed batten.

The cost of such a floor for a bathroom 59ft. long and 44ft. wide would probably be about as follows in London :—

	£	s.	d.
130ft. cube of fir in framing, 4s. 6d. ..	29	5	0
22 sq. super., 2½in. battens, 55s.	60	10	0
50ft. do. 2½in. do. in doorways, 9d...	1	17	6
30ft. do. Extra only for splayed bearers, 5d. 1½in. to 6in. high	0	12	6
20ft. do. Extra only for splayed bearer, 1s. 3d., wrought-iron plate screwed, and splaying floor battens	1	5	0
120ft. run 1½in. × 7in. plate scribed to floor, 4½d.	2	5	0
172ft. do. 1½in. × 4in. plate scribed to floor, 3d.	2	3	0
Lettering and naming each piece ..	3	0	0
No. 65 Cast-iron 6in. × 4in. × ½in. bearing plates, 6d.	1	12	6
„ 65 do. 4in. × 4in. × ½in. bearing plates 5d.	1	7	1
„ 20 do. Purpose made washers, 1s.	1	0	0
„ 20 ½in. bolts, 13½in. long, and washers, 1s.	1	0	0
„ 1 Extra for trap-door	1	10	0
Fees and expenses	15	0	0
	£122	7	7

The sections shown in Figs. 11 and 12 relate to a floor which recently came under the observation of the author. It is not designed in the manner just described, but a consideration of its points of difference may be interesting and instructive, especially as it is intended for the reception of considerable loads. No piece is framed into another, all the fixing being accomplished by means of spikes and dogs, and it will be observed that the heads have a very scanty bearing upon the posts, especially where a joint occurs, this latter being merely a butt joint.

Calculating the strength of the various members as affected by the loads adopted for the floor already described, the battens are just thick enough, but the floor joists should be 7½in. by 3in. instead of 4½in. by 3in., the heads 11in. by 2½in. instead of 7½in. by 2½in., and the posts 4½in. square instead of 4½in. by 3in. The cost of a floor framed in this manner, with stuff of the sizes shown, but capable of covering exactly the same area as the floor first described, would be £118 5s., but considering the very much less load the framing will bear this floor is seen to be not so economical as the first.

The sections shown in Figs. 13 and 14 relate to another floor in actual use. Calculating the strength of the various members as affected by the loads adopted for the floor first described, the boards are just thick enough, but the stretchers should be 6in by 8in. instead of 6in. square, and the posts need only be 4½in. square instead of 6in. square, so that the floor is evidently too weak in some parts and too strong in others. The cost of a floor framed in this manner with stuff of the sizes shown, but capable of covering exactly the same area as the floor first described, would be £152 15s. 6d. As its strength is governed by the weakest part, it is more costly and not so strong as the first floor, and moreover it is partly formed of frames, which are difficult to move and store away, while most of its parts are in excess of the weights which can be conveniently handled.

The Restoration of the West Front of Bath Abbey has now been practically completed at a cost of just over £3,000. The two ladders, with angels ascending and descending, in representation of Jacob's dream, the design for which was framed four centuries ago, have been restored, and, in the words of the Bishop of the diocese, "those who are now carrying out the work are merely translating into new stone the ideas that have been in some measure depicted there during the past 400 years."

THE GLASGOW INSTITUTE OF ARCHITECTS.

A MEETING of this Institute was held last week, Mr. John James Burnet, A.R.S.A., F.R.I.B.A., president, in the chair. It was intimated that the promised reply had not been received from the Royal Infirmary Committee to the protest lodged by this institute in connection with the recent competition, and the secretary was instructed to ask for a reply. A suggested programme was submitted for the visit to Glasgow in October next of the Royal Institute of British Architects on the occasion of their annual dinner, including a reception in their honour by the Corporation, lunch in the Exhibition, a visit to the University, Cathedral, &c.

A letter was submitted from the Corporation regarding the Woodside District Halls competition, stating that while the Corporation did not see their way to accept the suggestion of the Institute that in the event of a combined scheme of public reading-rooms and halls it be placed in the hands of the competitor for Woodside Halls, who had been recommended for employment by the assessors, without further competition, they felt that the competitors for Woodside Halls should receive some recognition, and they had accordingly agreed to pay to each of the authors of the three winning designs the sum of £10 10s., not as payment, but as recognition of the labour expended by them in connection with the competition.

To this letter the secretary had replied that, while recognising the good feeling expressed by the Corporation, the Institute could not but regret that their suggestion as to the employment of the architect recommended by the assessors had not been accepted, and pointing out that the main object of the institute in the representations they had made was to render the halls competitions more attractive, particularly to the younger members of the profession, and that they were strongly of opinion that the decision of the Corporation was unsatisfactory, and calculated to have unfortunate results in view of future competitions.

THE DEVELOPMENT OF DESIGN.

THE Edinburgh Architectural Society held a meeting on March 27th, when Mr. William Scott Morton delivered a lecture upon "Helps and Hindrances to the Development of Design." Mr. Morton began by mentioning that all artists were designers, but the distinction was to be made between the followers of art and the followers of fine art. A sketch of the history of design was given, from the middle of the nineteenth century, at which time there existed much dissatisfaction regarding design in architecture. The great exhibition of 1851 caused a great revival of Gothic architecture. The mediæval feeling possessed the public for a time, and then this gave way to the Renaissance. A healthy sign of the present day was the intercommunion of the arts and the artists.

There were at the present day a number of factors to contend with which did not exist in earlier days, such as centralisation in towns, the high value of ground (necessitating high buildings), the requirement of dwelling-houses for the working classes, the demand for large windows in shop premises, the growing evils of trade unionism, and the syndicates and combines which were breaking down personality.

The study of old work had a fascination, but those who devoted too much of their time to this were apt to become archæologists and drudges. The all-round men made the best designers. Good judgment was a fundamental law of good design. The form should be simple and the nature of the material should be considered. All detail should be congenial and enhance the main design. Mass and outline were more important than colour and detail.

Regarding colour, this climate was not favourable for high colour externally, and the materials at hand limited its use Veneers and marble were liable to decay and were objectionable from a constructional point of view. Internally any colour scheme was possible.

The various gradations of one colour were always pleasing. Stained glass was best when treated as a coloured screen and not as a picture.

Speaking generally on design, work was best done in sunlight and in peaceful circumstances, free from as much distraction as possible. Steadfast and patient study was still required, and only through this could strength come.

ST. MARY'S ABBEY, YORK.

THE EXCAVATIONS.

MR. BRIERLEY, who is superintending the works of excavation now proceeding at St. Mary's Abbey, York, under the auspices of the Yorkshire Philosophical Society, has furnished some particulars of the progress of these works.

It has for some time past been felt that the site of the chancel of the Abbey Church ought to be subjected to the same careful examination as that bestowed on the rest of the Abbey site, and hopes were entertained that the original pavement and perhaps even the high altar might be found in the course of exploration. But the excavating has so far been disappointing, for no trace of the pavement or of its foundation has been discovered, and nothing of interest has been found except a few moulded stones and one or two fragments of tiles and glass which had been thrown in with the soil and débris.

In continuation of this work, the Council have had the foundations of the main walls at the east end of the choir opened out. They are found to be of great size and solidity, and built of large blocks of stone, many of them moulded and evidently parts of the earlier church.

The foundations of the east wall are 9ft. wide, and where opened out against the north-east pier they are found to go down about 7ft. below the ground-floor level, and to be evenly faced on the inside with chiselled stone, which would suggest that there has been a chamber or vault there.

The Council are desirous of carrying on these excavations, for even if no objects of striking interest are found in the course of excavation, the clearing of the ground will reveal the ground plan of the chancel and enable the visitor to realise its extent and the magnitude of its enclosing walls. But unfortunately the income of the Society, hampered as it is by the repayment of a heavy debt, does not leave much margin for scientific work after payment of necessary expenses. It is to be feared that the work cannot be completed without outside pecuniary help.

THE TECHNICAL INSTITUTE AT CONSETT, NEWCASTLE.

THE new Technical Institute, which has been built and finished at a cost of about £5,000, was opened recently. The foundation stones were laid on Saturday, December 3rd, 1898. The Institute occupies a site at the north end of the town, facing into Park Road—the main thoroughfare between Consett and Blackhill—and adjoins the grounds of the Public Park. The building is set back from the road 16ft. The general design of the premises is a plain treatment of Renaissance, the exterior walls being faced with deep-red pressed brick and Dunhouse stone dressings. The principal entrance has a deeply recessed arched doorway, with carved spandrils forming the chief feature in the façade, and leads through a vestibule, with ornamental glass screen, into the entrance hall, from which direct access is obtained to the whole of the ground-floor rooms. Right and left of the entrance are ladies' and gentlemen's retiring rooms, with lavatory accommodation. Immediately opposite is the secretary's or head-master's room, with large store-room adjoining. On the left side of the hall are two class-rooms, and on the right side of the hall is the physics laboratory. The whole of the corridors are of fire-proof construction. The first floor consists of a chemical laboratory, store-room, balance-room, and preparation-room, lecture-room, class-room, and an art-room. The second floor has been specially designed with a view of being adapted for use as an art-room, with store-room, cloak-room, &c. Detached from the main building is a large room, 47f. by 16ft. wide, to be devoted to the teaching of manual instruction. The whole of the premises have been furnished by the North of England School Furnishing Company. The general contractor for the building is Mr. Edward Taylor, of Durham, and the painting was entrusted to Mr. Joseph Siddle, of Consett. The wrought-iron work has been executed by Mr. J. R. Crimson, of Gateshead; and the stained glass by Messrs. Reed and Millican, of Newcastle. The architect is Mr. C. E. Oliver, F.S.I., of Consett, and Mr. John Simpson, of Blackhill, has acted as clerk of works.

HOW THE ALDERSHOT BARRACKS ARE TO BE LIGHTED.

THE general scheme for electrically lighting the various barracks at Aldershot has been drawn up by the Commanding Royal Engineer, Colonel W. Pitt, and is divided for the purposes of contract into twenty-six subdivisions. In addition, the laying of cables from the generating station to the barracks will form a separate contract. Of these subdivisions, the first four, namely, the wiring and fitting up of Albuhera, Barossa, Corunna and Maida Barracks, have been given out to contract to four different firms, and it is expected that this work will be completed by the beginning of May, says the "Aldershot News." The firms employed are Messrs. Drake and Gorham, Edmundson's Company, Foot and Milne and the National Electric Wiring Company, all of London.

The system adopted for the wiring of the barrack-room is what is known as the steel conduit, the wires being carried in steel pipes, specially enamelled inside and out. For the ordinary rooms four lights, each of 8 candle-power, are provided, but in the T-shaped barrack-rooms there will be five lights, suspended at equal distances along the ceiling.

On the ground floor the pipes carrying the wires are run along the ceiling, but in the upper floors the wires are carried between the roofs in pipes, and then let down through the ceiling. The greatest care has been taken to ensure the fittings being of a character to withstand rough usage. There is nothing fragile about them. The globes will be suspended from the ceiling on what is known as a stiff pendant, that is, the lights will be screwed to the end of a 2ft. steel pipe carrying the wires.

In the officers' quarters the same system of wiring is adhered to, but the fittings and shades will be of better material and design, and the pendants will be flexible.

The lighting of the double canteens has proved a rather bigger job. All the wires are taken up into the roof by steel pipes, and from these 10 treble lights of three 8-candle-power lamps will be suspended to light the hall. All the other offices and institutions of the barracks will be suitably lighted, considerable ingenuity having been shown in lighting the prisoners' rooms and cells, so that their inmates cannot tamper with or damage the lamps.

The Generating Station.

This will be situate just north of Thorne Hill, and near the new Supply Depôt Abattoir. The installation will be laid down for 24,000 lights, and as the number of lights required for the twenty-six subdivisions so far mapped out is 14,000, there will still be provision for 10,000 lights being supplied from the station beyond the number required. All the cables and outside connections are to be laid underground, in glazed earthenware pipes, and this system is to be observed even between the blocks of barracks, so that nowhere in the camp will danger arise from exposed live wires. It is not intended to light the barracks in Wellington Lines or the Cavalry Brigade by electricity, as these are already provided with gas. Colonel Pitt has the supervision of the work, and is assisted by Mr. Mayne as advisory electrician.

Correspondence.

The Name of London's New Street.

To the Editor of THE BUILDERS' JOURNAL.

COCKERMOUTH.

SIR,—I have been much interested in the suggested names for the new street to be formed from Holborn to the Strand. Many things have evidently been carefully considered by the inventors or discoverers of these names, and patriotism has been by no means omitted. But there is one important consideration to which, I think, scarcely sufficient attention has been given. The future inhabitants of the thoroughfare are certain to receive many telegrams in the course of their business, and this is the basis of my suggestion. I would urge that whether the name be royal or military in its associations, or whether obtrusively municipal, it be limited to one word, and that a word of not more than ten letters.

The simplicity of a telegraphic address such as 48 Cheapside or 257 Strand is apparent. But follow the conventional and call a street, say, Queen Street, and every telegram sent to that thoroughfare requires an extra halfpenny. Add a specific monarch—call it Queen Anne Street—and the fine runs to a penny. Divide the street into two sections and you have Queen Anne Street North. Nor is this the limit of possibilities, for there are such things as back streets running parallel to the main artery of traffic, and called (at least in certain provincial towns I know very well) "Back Such-and-such Street." Indeed, I could name a particular thoroughfare, several hundred miles from London, where there is even "Back South John Street West." The Post Office should be kind to the town that so liberally helps it to a revenue at the cost of the long-suffering public.

I do not venture to specify a name; there are names enough to choose from already: but there are some to avoid, and a visit to some of the older towns in the country would discover names to be avoided. For instance, there is Shrewsbury, where one street is poetically named "Dogpole." Other towns are bewildering in their multiplicity of "Gates." I forget, if I ever precisely knew, the number of these in York. I know that the term has its uses, for if you call a thoroughfare Rivergate you may safely surmise that it leads to the river at some stage of its career as a street, and where that most-frequently used word "Briggate" appears you may look for a bridge over something, big or little.

However, when the time comes to decide on the name of London's new street it is hoped that the telegraphic limitation of ten letters will not be overlooked.—Yours truly,

ULYSSES.

Size of Gas Pipes.

To the Editor of THE BUILDERS' JOURNAL.

HAMILTON, N.B.

SIR,—With reference to the enquiry on page 122 of your issue for March 20th as to the size of gas pipes, a very good rule is to take $\frac{1}{8}$in. super. as the area of a pipe sufficient to supply one light. Thus, $\frac{1}{4}$in. will supply up to three lights: $2 \times 2 \times 0\ 7854 = 3{\cdot}1416$ superficial eighths of an inch—$\frac{3}{8}$in. $3 \times 3 \times 0{\cdot}7854 =$ fully seven lights; $\frac{1}{2}$in. pipe would supply $4 \times 4 \times 0{\cdot}7854$—twelve lights. This, if remembered, saves the trouble of consulting tables.

Yours truly,

CLERK OF WORKS.

A new Church at Prestonfield is proposed to be erected in Dalkeith Road alongside the present iron building. At present only a part of the building is to be erected. The plan includes a nave (the part now proposed to be built), capable of accommodating 500 persons, without galleries; a north and south transept, and a circular apse, which will give additional accommodation for 300, thus making a total of 800. On the south side and near the west end of the church there will be a tall circular tower about 15ft. in diameter. This tower will on the ground floor form an entrance porch, having a projecting doorway to the outside. The architects are Messrs. MacGibbon and Ross.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor The querist's name and address must always be given, not necessarily for publication.

Early-English Church Planning.

Ripon.—Anglo-Norman writes: "Did any of the cathedrals or churches erected in England during the eleventh or twelfth centuries possess choirs (as they are now designated) equal, or nearly equal, in length to their naves?"

If by "choir" is meant the east limb of a cross-planned church, querist will find that while in our great Benedictine abbey-churches of the latter half of the eleventh century this was usually as to length from about one-third to one-half of the west limb, Carilephs Durham made it fully two-thirds, and Gundulphs Rochester equal to or longer than the nave. But it must be remembered that in these cases the buildings of the naves came later, and until the west ends were set up, the lengths were probably undetermined. However, Ernulph's rebuilding of Canterbury quire, in 1093, set it out to be definitely longer than the nave of Lanfranc; and, probably contemporary, at Lewes came a similar quire addition to the Cluniac church. The canons' churches of the twelfth century, such as St. Martin's and Bradsole, Dover, were often built with quires as long as, or longer than, the naves; and at Kelso the Tironensians attached only a single nave-bay to their spacious quire and transept, though the design here is quite complete. It is doubtful if Hexham ever had a nave at all, though "restorers" are now thinking of "restoring" it. St. Andrews and Tynemouth should be noted as having long quires of the twelfth century, though not all of one date. By the end of the twelfth the secular cathedrals, Hereford, Chichester, Lincoln and possibly York, had built to the east of their crossings at greater length than to the west.

EDWARD S. PRIOR.

Constructing Brewer's Coolers.

Potton.—Kilderkin writes: "Which is the best method of putting together a brewer's cooler so as to ensure its being liquor-tight? The size of the coolers is to be 10ft. by 17ft. inside and 7in. deep. The accompanying sketch (not reproduced) shows the proposed method—the bottom pinned to bearers with oak pins and nailed to sides and ends. We believe white cedar is the wood often used, but we would be glad to know if best yellow deal is less suitable."

We should strongly advise querists not to do a work of this kind without previous experience. Ordinary wooden vessels for cold beer or water are comparatively easy to construct, but with a large shallow vessel for hot beer the difficulties become very great. It is not so much the timber as the method employed. Nothing in the nature of rebates, tonguing, halving, or mitring is allowable; an absolutely plain square joint must be used, and it is in making this that the difficulty arises. We should certainly not advise white cedar for this purpose; nothing but the best picked yellow deal can be used. It would be far more satisfactory for querists to get the work done by regular back and vat makers.

BREWER.

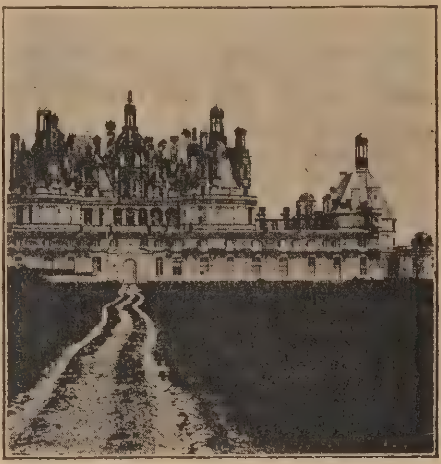
Fumigating Oak.

Nottingham.—Querist writes: "What is the method of fumigating oak, and in what way can this treatment be detected?"

The method of fumigating oak was described on page 392 of the Builders' Journal for December 19th last. This practice, however (meaning that connected with modern "antique" furniture), is much to be deprecated, as it is essentially wrong in principle.

An Architectural Tour in the Loire Valley.

Glasgow.—E. E. M. writes: "A party of architectural students propose visiting the châteaux in the Loire Valley this autumn. Kindly recommend any books which could be studied previously, and give any information as to the best buildings to visit, where to write to for permission to sketch, how to reach them, and where to put up."



CHÂTEAU DE CHAMBORD.

STAIRCASE AT BLOIS.

The only first-rate book to consult is "Palais, Châteaux, Hôtels et Maisons de France du XV^{e}. au XVIII^{e}. Siècle," by C. Sauvageot. It is a large and expensive work, full of beautiful illustrations, and can be obtained from Mr. B. T. Batsford, 94 High Holborn, W.C. The district of the Loire Valley is one of the most interesting in Europe, but the tour as a whole can be improved by following different routes on the outward and homeward journeys beyond Paris. We would suggest that the principal places at which residence might be taken up should be Chartres, Le Mans, Angers, Tours, Blois and Orleans, in this order, and that a hotel be written to in advance at each place, asking terms and stating approximately the accommodation required and the probable duration of the stay. Foreign reply postcards should be used, price 2d. each at any post-office. It is not always so easy to know who to write to for permission to sketch. Where there is a cathedral it is best to address to the "Doyen de la Cathédrale," and it is always wise to write to the Mayor (Maire) respecting buildings held by the municipality. Some of the great châteaux belong to the State and permission to sketch in them should be sought through the English Ambassador at Paris, while for the privately-owned châteaux it is necessary to wait till you reach the neighbourhood and then to write to the owner, whose name you ascertain locally. The R.I.B.A. travelling card is often of great assistance, and reply postcards should be sent whenever an answer is required, remembering that ordinary English stamps and postcards are useless for the purpose. At Chartres stay at the Hôtel du Grand Monarque. The cathedral is the one great architectural object, with its fine triple doorway and its magnificent stained glass. Le Mans (Grand Hôtel) also possesses a remarkably fine cathedral but little known to English students, and the two fine churches of Notre-Dame de la Couture and Notre-Dame du Pré. Angers (Grand Hôtel) is even less known. The cathedral has a good west door and carved pulpit, to say nothing of King René's bénetier. Of several other churches the most important is S. Serge, on account of its Gothic mouldings, while there is much material for the sketch-book in the Hôtel Pincé and other old houses. Tours (Grand Hôtel de Bordeaux) is the centre of a very rich district, but it is the headquarters of an army corps, and so care must be exercised in sketching not to arouse suspicion. Its cathedral contains part of an altar piece from S. Zeno, Venice, and has good towers. In the town are many sketchable old houses, including that of Tristan l'Hermite, and the abbeys of St. Martin de Tours and Marmoûtier. Making Tours a centre, Plessis-lès-Tours should be visited from it, as well as the Châteaux of Azay-le-Rideaux, Chinon, Loches, Cinc Mars, and Chenonceaux, the station for the last named being Véretz. Of these châteaux the first and last named are the most important architecturally. Château d'Amboise might be visited as a day-excursion *en route* to Blois (Hôtel d'Angleterre), where, besides the well known Château, there is a fine old building in the Rue St. Honoré known as Hôtel d'Alluye, and a seventeenth-century cathedral. The Château de Chambord can be visited from Blois, the nearest station being Bracieux-Chambord, on a branch line. Orleans (Grand Hôtel St. Aignan) contains much of great interest, especially the old Hôtel de Ville and the houses of Jeanne d'Arc, Agnes Sorel, Francis I., and Diana of Poitiers, besides the cathedral and some good churches. To sketch over the district thoroughly would occupy several months, but even a hasty traverse would be of enormous value to any student. Information as to trains will be found on pages 42, 38, 39 and 34 of the Continental edition of Bradshaw, price 2s.

It is also possible to reach the district by way of London, Newhaven and Caen, whence there is direct train service to Le Mans. This is rather cheaper than passing through Paris.

G. A. T. M.

Elementary Geometry.

London, E.—W. H. A. writes: "Kindly name a book containing the principles of elementary geometry."

Both Angel's "Elementary and Advanced Geometry" (1s. 6d. and 8s. respectively) should be thoroughly mastered. The books can be obtained from Mr. B. T. Batsford, of 94 High Holborn, W.C.

Buildings in and around Shrewsbury.

Hastings.—Nancie writes: "Are there any places of architectural interest in and around Shrewsbury, Salop? I should like to know of those places of particular interest to an R.I.B.A. probationer preparing for intermediate examination."

See an article on Shrewsbury in our issue for September 26th last.

Air and Floor Space in Lodging-Houses.

Ripley Down.—Air Space writes:—"What amount of floor space *per person* is generally allowed for sleeping-rooms in model lodging-houses? Also how many cubic feet of space per person; also how many cubic feet of air per person per hour?"

In common lodging-houses 300 cubic feet of air-space is required per person, the amount having been raised at intervals from 240 cubic feet. The Local Government Board Model By-laws recommend 400 cubic feet in registered tenement rooms, both for living and sleeping. Children under ten years of age are allowed half the amount. The Army Regulations require 600 cubic feet per head, and physiologically 1,000 cubic feet per head is desirable. No height above 12ft. from the floor is reckoned as effective space, and the minimum floor space is

30 square feet per person. By the Factory and Workshops Act (1895) 250 cubic feet is the minimum allowance per person during the day, and 400 cubic feet during overtime work. A man at rest requires 3,000 cubic feet fresh air per hour to keep the carbon dioxide (CO_2) down to 0 06 per cent. and secure sufficient purity. In full work twice this quantity is required, and if working under pressure in a caisson three times this quantity is necessary. The minimum window-surface is one-tenth the floor area. Air entering near the floor should not exceed 2ft. per second, but if admitted higher up 5ft. per second may be allowed for inlets, and 10ft. per second for outlets. The usual allowance is 20 cubic feet fresh air per minute for each person, and three times that quantity for each gas jet. An open fire in a room abstracts 600 cubic feet of air per minute, mainly from the bottom of the room, although it is the upper portion that requires removal.

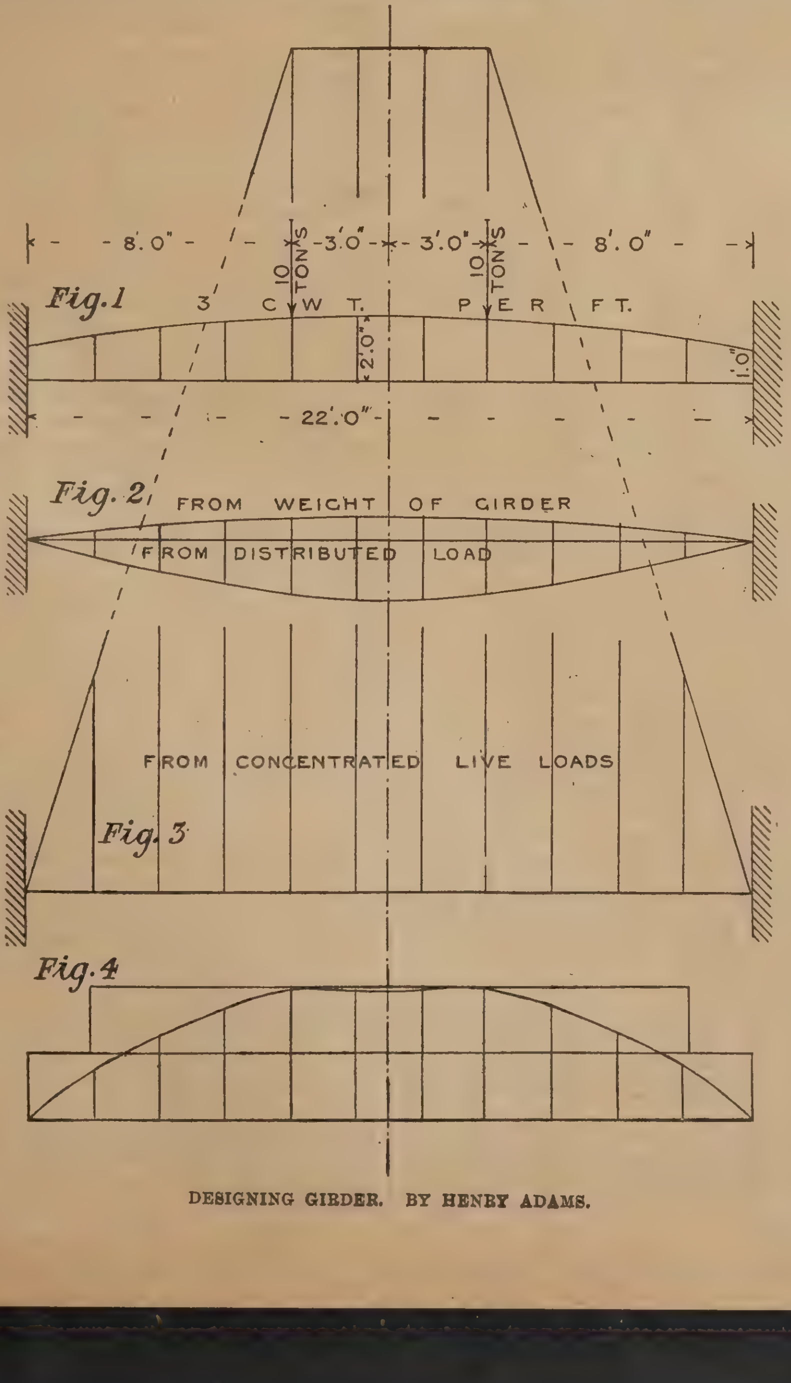
HENRY ADAMS.

Designing Girder.

TODMORDEN, YORKS.—C. writes: "Kindly state how to determine the size of a girder necessary to comply with the following conditions: Span, 22ft. clear; ends fixed in between two retaining walls—vertical; dead distributed load, 3cwt. per foot, not including girder; two 10-ton live loads, one 3ft. on the left and the other 3ft. on the right of the centre of the girder; the top of the girder at the ends must not be higher than 1ft. above the bottom of the girder at the centre, and the depth at the centre must not exceed 2ft.; the girder will on one side have to support steel girders laid at right angles to it at 3ft. centres; these are included in the distributed load mentioned. I can get a built-up steel or wrought-iron girder to satisfy these conditions, but it becomes heavy, and I think a bowed girder whose bottom flange will be lower at the ends than at the centre would be more economical, either in cast-iron, wrought-iron, or steel."

This is rather a peculiar case, and it would have been of some assistance in designing if the circumstances had been more precisely stated. The girder can be made hog-backed, with a straight soffit, or only the ordinary camber. Let Fig. 1 be the general arrangement. Fig. 2 will be the diagram of bending moments from distributed load, allowing $1\frac{1}{4}$ tons for weight of girder. The height in centre of parabola representing bending moment from weight of girder will be $\frac{Wl}{8} = \frac{1\frac{1}{4} \times 22}{8} =$ 3 4375, say, 3·5 ft.-tons, and a suitable scale will be $\frac{1}{10}$in. per ft.-ton. If the distributed load is brought on the girders by cross girders at 3-ft. intervals, it will not be quite identical with a uniformly distributed load; instead of a parabola for bending moment it would be a polygon approximating to a parabola, so that there might not be a great difference. Assuming the load as equivalent to 3 cwt. per foot run uniformly distributed, the depth of parabola in centre will be $\frac{wl^2}{8} = \frac{3 \times 22 \times 22}{8} = 181{\cdot}5$ ft.-cwts., or $\frac{181\ 5}{20} = 9\ 075$ ft.-tons, which may be added below the other in Fig. 2. Fig. 3 shows bending moment diagram for the two concentrated live loads assumed as equivalent to $\frac{8}{5}$ of similar dead loads = 16 tons each. The maximum bending moment for these will be 16 by 8 = 128 ft.-tons. It is now necessary to combine these into one diagram, but it should be done in such a way as to make it available for determining the thickness and length of flange plates. Measure up the combined value at 2ft. intervals and mark on diagram, divide each by the proposed depth of girder in feet at that point, and this will give the total stress in flanges at each point. The total bending moment at any point (M) divided by the depth of girder in feet at that point (d) will give the total stress in flange, and this divided by the working intensity of stress (f) will give the sectional area. The sectional area divided by breadth of flange in inches (b) will give the thickness, and this $\left(\frac{M}{dfb}\right)$ being worked for each point the diagram will then represent the thickness of top flange throughout the girder. Say working stress on mild steel 6 tons per square inch of gross sectional area, and breadth of flange 1ft., then the diagram will be as Fig. 4 and the plates as marked. The area contained between the curve and base line is the theoretical material necessary in a solid homogeneous flange, and the outer plates have therefore to be continued far enough beyond the curve to make a secure connection. The bottom flange will be the same figure inverted.

HENRY ADAMS.



DESIGNING GIRDER. BY HENRY ADAMS.

Notice under London Building Act, 1894.

LONDON, S.W.—J. H. T. W. writes: "My client proposes to build an external wall against a neighbour's external wall now forming the boundary of his property. Is it necessary to give the adjoining owner notice of this intention under Section lxxxvii., 5 and 6? The clause says 'may,' not 'must' or 'shall,' serve notice on the adjoining owner."

Unless notice be served under sub-section 5, the privilege of extending footings under the neighbour's wall cannot be claimed under sub-section 6. At the same time it is generally expedient to translate "may" as "must" in all such cases, even where this privilege is not sought, in order to give the adjoining owner the opportunity of objecting, if, in his opinion, the erection of the new wall would be likely to damage his old one by lateral pressure—for instance, against a low cellar wall—and for the purpose of avoiding future litigation.

G. A. T. M.

Lime Cartridges for Blasting.

LONDON, E.C.—T. W. & Co. write: "Could you inform us who are makers of compressed lime cartridges as used in stone quarries for blasting purposes?"

C. Sebastian Smith, F.S.I., Shipley, Derby, manufactured lime cartridges, but ceased manufacturing several years ago in consequence of the Government not objecting to the use of high explosives in fiery mines, notwithstanding the fact of their giving off flame. The work done by these cartridges was exceedingly good and of course perfectly safe, but being more cumbersome than explosives it was impossible to obtain a sufficiently constant demand to make it worth while keeping the factories working. Doubtless if you write to Mr. Smith he can furnish further details.

W. MILLAR.

Competitive Examinations Under Government.

LONDON, E.—W. R. B. writes: "What appointments are open to competition under the Government and municipal bodies for surveying (quantity or otherwise) and civil engineering? What are the necessary qualifications, or where can particulars of them be obtained?"

The principal appointments of this nature under Government are those of Assistant Civil Engineer, Admiralty; Assistant Surveyor, Royal Engineers; and Assistant Surveyor, Admiralty. These are obtained by open competitive examination, particulars of which will be supplied gratis by the Secretary, Civil Service Commissioners, 68 Victoria Street, S W., who will also supply details of the examination for County Surveyors in Ireland. Appointments under municipal bodies are, as a rule, obtainable only by application, supported by local influence.

G. A. T. M.

Keystones.

A new Welsh Church at Pentrebach, near Merthyr, dedicated to St. James, has been opened. Mr. John Griffiths was the contractor, and Mr. Penry Williams the architect.

A Church Institute at Portsea in connection with St. George's Church is to be erected from designs by Mr. G. Vernon-Inkpen, C.E. The tender of Mr. A. W. Bevis, of St. Thomas's Street, Portsmouth, has been accepted for the work at £735.

The Portman Market, which has been constructed close to the terminus of the Great Central Railway, will be opened by the Mayor of Marylebone on April 18. The building has been erected at a cost of about £40,000.

A new Mission Church at Barnsley, to be dedicated to St. Mary Magdalene, is being erected, to seat 120, in the parish of St. Peter's. There will also be a schoolroom, made so that the rooms can be thrown into one, giving accommodation to about 400.

At St. Endellion's Church, Wadebridge, a reredos is to be erected in memory of the late Queen Victoria at the east end, with such other necessary improvements in the chancel as will correspondingly beautify it. The church itself is in a good state of preservation. The estimated cost is £100.

A new Wesleyan Mission Hall at Bradford is to be erected in Leeds Road, Eastbrook, from plans by Mr. W. J. Morley, F.R.I.B.A., of Bradford, who also designed the Wesleyan Mission Hall at Manchester. The ground floor front will be occupied by shops. The accommodation provides for a large principal hall, and a considerable number of rooms for the auxiliary institutions which grow out of such a mission.

Bedale Parish Church has just had a memorial erected in memory of the late Rev. John George Beresford, who was rector of Bedale for 38 years. The memorial consists of two choir screens of solid oak, which have been designed by Mr. Hodgson Fowler, architect, of Durham. The work has been carried out by Messrs. Beaumont and Sons, of Stamford. A fragment of the old rood screen which formerly spanned the chancel arch and was discovered recently, has been incorporated in the panels of the new screen on the north side of the church.

New Royal Exchange Frescoes.—No fewer than three additional frescoes for the decoration of the Ambulatory of the Royal Exchange are in progress, and at least two others are projected. Mr. Frank Brangwyn is preparing one of "Modern Commerce," which will form a pair with the late Lord Leighton's "Ancient Commerce," in which the Phœnicians are trading with the early Britons. The fresco of Mr. E. A. Abbey, R.A., which is illustrative of the historic quarrel between the Merchant Taylors' and the Skinners' Companies will be erected in its place in the course of the present year. For the third one, Mr. Chevalier Taylor is at work on a design on the subject of the banquet to the five Kings in the reign of Edward III. All these frescoes are fixed by a comparatively new process known as "Marouflage," and are painted in a medium technically termed spirit fresco.

A new Church for North London.—A new London Baptist Association church and schools at Muswell Hill, N., is to be erected. The seating accommodation will be about 900 persons. The ceiling will be vaulted in woodwork. A tower terminated with a spirelet will form a prominent feature in front. The buildings are to be faced with red brick with Bath stone and Coatessey dressings. The style adopted is Late Decorated Gothic. Messrs. Matlock Bros.' (Wood Green) tender of £6,408 16s. has been accepted for the work. The architects' estimate was £6,780. The design was selected in a recent competion limited to six architects, the alternative designs by the same authors, "Greek Cross" and "Twentieth Century," being placed respectively first and second. The architects of the selected design ("Greek Cross") are Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5 Clement's Inn, Strand, W.C.

In the Parish Church of Wooburn, Bucks, a new reredos has been erected.

The Memorial of the late Bishop Creighton is to take the form of a standing figure in marble in the act of blessing. Mr. Hamo Thornycroft, R.A., is to be the sculptor.

Wansford Church is to be restored. It is intended to erect a new chancel, vestry and organ loft, underpin the tower and reroof the nave. The cost will be about £1,500.

The Bells of St. Peter's Church, Finsthwaite, are about to be overhauled and put into proper order by the makers, Messrs. Harrington, Latham and Co., Earlsdon, Coventry.

The Edinburgh Architectural Association recently visited the Victoria Cabinet Works, Kirkcaldy, of Messrs. A. H. M'Intosh and Company. The works are perhaps the most extensive of their kind in Britain. In the afternoon the Adam Smith and Beveridge Memorial Halls were visited, where Mr. James B. Dunn, the architect, described them.

A new Church for Blackley.—The Rev. W. Schofield Battersby is appealing to the loyal ladies of England for 40,000 crowns, or 10,000 sovereigns, to enable him to build a Victoria Memorial Church in the parish of Holy Trinity, Blackley, Lancashire. Of the £10,000 required £8 000 is to be spent on the church, £1,500 on a rectory and £500 on a temporary building.

At Northmolton Church a lych gate has been erected. The walls are of local stone, the dressings of Dartmoor granite, the woodwork of English oak, and the roof of tiles. The masonry has been done by Messrs. Sanders and Son, of Southmolton, and the oak work by Messrs. Harry Hems and Sons, of Exeter. The architect was Mr. James Crocker, F.R.I.B.A., of Exeter.

A New Drill Hall at Blaydon, erected for the use of the Blaydon and Winlaton companies of the 5th V.B.D.L.I., was formally opened last week. The structure, which is of stone, and situated midway between the two villages on a site given by the owners of the Towneley Estate, has been erected at a cost of about £1,500. Mr. M. H. Graham, of Newcastle, was the architect.

A New Quarter Sessions Court at West Ham is being erected on a site adjoining the Borough Police Court in West Ham Lane and will comprise an extension of the present Police Court, together with a new Coroner's Court in addition to the Quarter Sessions Court. The buildings were designed by Mr. Lewis Angell, the late borough engineer, and are being carried out under the supervision of Mr. Morley, the present borough engineer. On the ground-floor the buildings will contain a court-room and rooms for the recorder and magistrates as may be required, counsel and solicitors' rooms, a warders' room, and rooms for prisoners. On the first floor there will be rooms for the jury, grand jury, and several offices. The second floor will contain offices for the assistant clerk, and there will be a mortuary at the rear with a separate ambulance entrance. The contract has been let to Messrs. Gregar and Son, at £10,839.

The Paris Exhibition.—Certain of the buildings erected for the late exhibition are still awaiting demolition, their proprietors being greatly embarrassed as to how to dispose of them. As the result of the breaking up of the monster show the market is glutted with old building materials, and the owners of the pavilions are reduced to paying heavy sums to have their property carted away. A characteristic story is being told of the fate of one of the most admired of the national pavilions in the Rue des Nations, an elaborate edifice the outlay on which ran into several thousand pounds. The Commissioner-General of the country to which the pavilion belonged informed his Ambassador, with much satisfaction, that he had concluded an excellent bargain. "I have sold our pavilion," he explained, "for £36." The Ambassador admitted that the transaction did not strike him as particularly brilliant until the Commissioner added that if he had not found a purchaser for the pavilion he would have had to pay £600 to have it demolished.

Mr. Charles Stanyer, master decorator and paperhanger, &c., 9 Newgate Street, Chester, died last week at the age of 66 years.

The People's Palace Architectural Society held its second annual meeting at the People's Palace, Mile End Road, E., on March 23rd, Mr. F. R. Taylor in the chair, when officers for the ensuing year were elected.

The Theatre at Southborough, near Tunbridge Wells, is controlled by the Urban District Council, and helps to reduce the rates. The building was erected at a cost of £6,000, Sir David Salomons contributing one-half and the ratepayers the other. The first year's working has brought in a revenue of £200, and after a small sum has been deducted for expenses the remainder will go to the relief of local taxation.

M. Cazin, the French landscape and historical painter, died last week. The son of a Boulogne doctor, he studied under Lecoq de Boisbaudran, and was professor at Trélat's School of Architecture and next at Tours. After the war of 1870 he was for five years teacher of drawing at South Kensington, and after his return to France his pictures at the Salon attracted increasing notice. Since 1883 he has devoted himself to landscapes.

The Crossley Hospital at Mirfield for the isolation and treatment of scarlet fever patients has been enlarged by the addition of a temporary structure of match-boarding and galvanised iron. The additions consist of two wards for the treatment of typhoid patients, having accommodation for six male and six female sufferers. Each ward is complete in itself, having its own kitchen, bathroom, and other conveniences. Mr. F. H. Hare, the surveyor to the Mirfield District Council, has prepared the plans for the additions, which, with the furnishing of the administrative block, cost about £1,600.

A Sanatorium at Birch Hill, Frodsham, is being erected. Four bungalows scattered in the forest will accommodate four patients in each. In the hospital there are to be two large sitting-rooms. Accommodation for twenty-five patients will be provided by ten double-bedded rooms and five single-bedded rooms. There is to be a balcony on the first floor, where beds can be brought out if the weather is favourable. The buildings will cover five acres, and 25 acres have been provided for recreation purposes; the whole of this has been planted with trees. The sewage is destroyed by bacteria beds.

The Glasgow and West of Scotland Technical College Architectural Craftsman's Society held a meeting on Friday, 22nd ult., when papers were read by Mr. Robert Stuart, of Herbertson and Sons, wrights, and Mr. William H. Baxter, on the subject of "Temporary Carpenter Work." Mr. Stuart treated of the construction of crane seats and gabbert scaffolds. With regard to crane towers, he advocated that the centre tower, which contains the mast, should be 14ft. square instead of 10ft. or 12ft. to ensure there being as little overhang of the crane as possible, and the mast, he was of opinion, should be in two or three thicknesses well banded and bolted together. As to gabbert scaffolding care should be taken that there be sufficient space provided between the timbers and the wall in order that, in the slight swaying which takes place no injury was done to the stone or brickwork. Little or no nails should be used in the fixing of scaffold timbers, as they entailed great difficulties and danger to workmen in the taking down, bolts being used in all cases for this purpose. Mr. Baxter, in the course of his remarks, which were confined to the construction of temporary stand, made reference to the Glasgow Exhibition work of this kind, and dealt with numerous types for different conditions and purposes. The lecturer was of opinion that round timbers could be used advantageously and with decided artistic effect—Norway poles being cheaper than three thicknesses of battens, as commonly used here, and with the bark intact, could be treated in picturesque fashion with little difficulty. Mr. Baxter also dealt minutely with various formulæ for the calculations of strengths of timber supports.

A Portable Pump.—A saw mill at Archangel, Russia, has just been supplied with a pump of the same design as those employed in South Africa for supplying the troops with water. This is of the Merryweather "Valiant" pattern, capable of discharging water at the rate of 200 gallons per minute. The machine is light and portable, can be got rapidly to work and is available for all kinds of pumping purposes, including water supply, fire extinguishing, &c.

The Institute of Sanitary Engineers.—At a meeting of the election committee held on the 13th ult. the following gentlemen were elected as Associates:—Messrs. F. Bovey, Holloway; J. Buckeldee, Hillingdon; and J. Whittaker, Pleasington. At the examination in sanitary engineering held on the 22nd and 23rd ult. the following passed, qualifying for associateship:—Messrs. W. J. Lane, Croydon, and R. J. McKenn, Manchester.

Building at Darlington.—In connection with the large locomotive engine works which are being built on the Springfield Estate, near Darlington, by Messrs. Robert Stephenson and Co., Limited, there is a project for the erection of 582 houses on land in the locality. The company have had plans drawn of various kinds of houses and cottages, including semi-detached buildings of a somewhat better class. The land will be sold to builders and others to carry out the scheme upon the scale and plans laid down by the company.

Newport (Mon.) Technical Institute Competition.—The Technical Instruction Committee last week, upon the recommendation of Mr. S. B. Russell, A.R.I.B.A., London, the assessor in this competition, decided to award the first prize of £50 to Mr. Norman M. Brown, architect and surveyor, 156 Dock Street, Newport, and the second prize of £25 to Messrs. Swash and Bain, architects and surveyors, Midland Bank Chambers, for designs of the Proposed new Technical Institute in Clarence place. The awards are subject to confirmation by the Town Council.

New Bonded Warehouses at Edinburgh are proposed to be erected by Messrs. Andrew Usher and Company at St. Leonard's from plans prepared by Messrs. Leadbetter and Fairley, architects, of 17 Young Street, Edinburgh. The present area is to be increased and the new premises will extend to a distance of 750ft. with an average width of 70ft. The eastern portion of the buildings will be occupied by bonded warehouses five floors in height. This part will measure 304ft. and will average 65ft. in width. The northern portion, measuring 245ft. by 71ft., will be occupied by cellars, bottle-washing premises, &c., on the ground floor, and on the second the dispatch department. The centre of the building will consist of vatting and mixing cellars, a large covered court, offices for the company and excise, &c. The elevation to the Queen's Park will be built of stone. The reconstruction of the premises is expected to cost about £25,000.

Use of Defective Mortar.—The Paignton District Council recently took action relative to the use of alleged defective mortar in house building, directing that samples of the mortar being used by all the builders in the town should be taken. This was done, and one sample was reported by the independent expert to whom it was submitted to be so defective that the Council had no alternative but to prosecute. This course was the more imperative seeing that the builder complained of was a member of the Council. Had they allowed the case to pass unnoticed, in the face of the analytical and expert reports they had, they would have been deserving of censure, and would have exposed themselves to the charge of allowing members of their own body to ignore the by-laws. But the expert evidence for the defence was so strong in declaring that the mortar used in the building was good that the Bench had no hesitation in dismissing the case. Apparently a larger sample should have been taken to make it quite clear that it was representative of all the mortar in the heap. It would also appear to be advisable that the by-law should state definitely what constitutes good mortar.

AN AMERICAN THEATRE.

THE Colonial Theatre, Boston, U.S.A., designed by Mr. C. H. Blackall, has just been erected. A wrought bronze and glass canopy projects over the sidewalk to the curb line. The vestibule is an apartment 19ft. wide and some 60ft. long, the walls being covered with marble to a height of 9ft., with a marble cornice above resting upon heavy pilasters of Brescia marble with bronze capitals. From the marble cornice springs an elliptical panelled ceiling. The floor is of mosaic, consisting of a plain centre with a border 2ft. wide, closely following the spirit and style of the celebrated Pompeian mosaic now preserved in the Naples Museum. The wall space between the top of the marble dado and the cornice is decorated with festoons of fruits and flowers in the Pompeian style. Beyond the vestibule is the main foyer. This apartment, measuring about 18ft. in width by nearly 100ft. in length, is carried out in Louis XV style, all the finish being in satinwood. Opening from the foyer is the ladies' room, measuring approximately 20ft. by 30ft., carried out in Louis XV. style. The stairways leading from the main floor to the balcony are of bronze, finished in design to correspond with the rest of the work. In style, the design of the interior of the theatre may be characterised as being in the sixteenth-century Italian Renaissance details, the scheme of the decoration and the general design being in the spirit of such historic structures as the Vatican, portions of St. Peter's and the Farnese Palace. The elaboration, of course, is concentrated about the proscenium, which measures 37ft. 6in. wide and 38ft high. The scheme of decoration of the interior is in a strong green or blue and gold predominating note. The blue, green and gold is carried through all the decorations of the house, so as to give a full, rich aspect to the interior entirely opposed to the white and gold style which has been a favourite scheme of decoration in past years, the idea being to produce a general richness of effect. The woodwork of the seats is of deep rich rosewood, and the upholstering is of real leather of a dull green colour. The framework of the chairs is of electro-bronze.

There are four curtains. The fireproof curtain is of asbestos, while the main curtain is a single sheet of rich royal crimson, perfectly plain. The act-drop is of tapestry, painted by H. B. Pennell, and in addition to this there may be a curtain of plain black velvet which will be used in making quick changes between the acts. There are thirty-six dressing-rooms for the artists, besides two special dressing-rooms for the stars, a large ballet-room and two large apartments for the supers. The stage itself is specially constructed to accommodate large productions, and the rigging and the construction of the fly galleries are of sufficient strength to safely take care of more than 50 tons of scenery at any one time. There is a depth beneath the stage floor of 25ft., and a height above the stage level to the gridiron floor, to which the ropes are attached operating the scenery, of 77ft. The theatre is equipped throughout with a full complement of automatic fire-alarms, automatic sprinklers, standpipe, and hose, and all the latest and most approved devices for safety. For the lighting of the stage a capacity of more than 4,000 electric lamps is required. The border lights and footlights are arranged in four colours, red, yellow, blue, and white, each colour being controlled by a separate dimmer, so that the lights can be raised or lowered at will, and for the control of all these lights a special and unusual switchboard has been designed by the Erickson Electric Equipment Company. This board is of an entirely new design: instead of the usual arrangement of jack-knife switches and rotary dimmers, which would involve a switchboard 8ft. or more in length, and make it extremely difficult of control by the operating electrician, the board consists simply of a bank of push buttons arranged on a table or ledge, 6in. or 8in. wide, and 2ft. or 3ft. long. These push buttons, which are operated much like the keys of a typewriter, control a series of valves through which air under a high pressure is carried to the actual switchboard in the basement, where the levers are pulled or the dimmers rotated at the will of the operator on the floor above.

The heating and ventilation of the theatre have received the most careful consideration. A powerful electric fan in the sub-basement draws air from out-of-doors and forces it over a series of steam-pipes and into the space immediately under the auditorium, the whole of this space serving as a large heating chamber, the air being maintained by the fan under sufficient pressure to force its way up into the various portions of the house. The air enters through the legs of the seats all over the floor of the house, and also comes out through the face of the risers of steps of the balcony, besides which special ducts of fresh air are carried up each side of the proscenium; and then, to prevent the draughts which are so common in theatres, additional reheating coils are placed each side of the orchestra. For the removal of the vitiated air there are large exhaust registers in the ceiling under the gallery connecting to cross-ducts leading up through the rear wall to the space over the, auditorium. Also, there is provided, in connection with the ceiling decoration, ventilating openings as a part of the decorative design through which the air can escape, the total area of these exhausts in the ceiling alone being more than 100 square feet. Over the auditorium ceiling there are lines of huge girders supporting the six storeys of the office building above. Between these lines of girders ample space is allowed for the passage of the exhaust air under the auditorium, which, after escaping through the ceiling outlets, is led into a large chamber in which is a fan, a duplicate of the fan which is in the sub-basement, and this exhausts the air and delivers it up a shaft measuring something over 125 square feet in area, and carried above the roof of the office building. The heating and ventilation system is based on the supply and removal of 50 cubic feet of air per minute to each occupant of the house.

ITALY'S ARTISTIC REMAINS.

THE adequate preservation from destruction by individual owners of ancient buildings and monuments is one of peculiar difficulty in a country like Italy, which is full of remains of the highest interest. Our Consul in Naples, in a recent report, says that year by year now a church, now a gateway of a castle, or even the castle itself, is declared to be a national monument. Treasures bought by dealers from remote villages are constantly pounced upon, and permission to export them is refused. No picture may leave the country without being submitted to experts, who have to decide whether it forms part of the history of the country or is in itself of such artistic value as to necessitate its retention. At Naples, and probably in all the important towns of Italy, there is a special commission consisting of sixteen members, presided over by the Syndic, who are appointed for four years. It is the duty of this commission to discover interesting things in the city which have not been noticed before, to prevent the disfigurement of those already under their care, and to keep the whole in order and repair. The Naples Commission was established in 1874, and has lately published its proceedings to the end of 1898 In these twenty-four years it has done much excellent work, having rescued many interesting and beautiful fountains which were in neglected streets and transferred them to worthier localities. It has also saved a vast number of frescoes, cleaned off the whitewash with which they had been smeared, and opened them to the public for exhibition. Above all, it has saved a noble gateway of Alfonso of Aragon from destruction.

A Carnarvon Improvement.—The Carnarvon Town Council propose to demolish a slum area known as Baptist Street, and a couple of courts leading therefrom, and construct thereon a new and wider street. The outlay contemplated amounts to £3,500.

Trade and Craft.

"Teon" Belting.

The "Teon" belting made by Messrs. Fleming, Birkby and Goodall, Limited, of Halifax, has established for itself a reputation for excellence. It is a composite belt. The basis is a specially woven fabric, without joint or seam, which is built up in plies and then cemented together under great pressure. The cement is a secret preparation and is the prime factor in enabling the belt to withstand all shocks and strains. No ingredient used in this cement is influenced by any heat under 230 degrees Fahr., and even at a higher temperature the cement is unaffected in its adhering power. Careful tests have been made with this belting, which has been found to resist the action of steam, oil, acid, alkali, and water; so that it is very sound and durable. Every belt is passed through a specially devised stretching apparatus, thus taking out practically all "stretch." The manufacturers give the following very satisfactory guarantee: "We make no extravagant pretensions for 'Teon,' but are prepared to stand by all we claim for it, and if after trial under conditions which, having been accurately explained when the order was given, a 'Teon' belt should prove a failure, we shall be willing to replace the same with a new 'Teon' belt free of charge as proof of our good faith. Should any dispute arise in regard to this guarantee, we will accept the decision of an arbitrator to be mutually agreed upon."

Commercial Enterprise.

It is a feature of the commercial life of to-day that the influential firms whose names are now household words should continue to grow bigger and bigger. This is proof that their productions win for them, year by year, new clients and new business; and as an inevitable result it becomes imperative from time to time to make extensions of premises. An instance of the kind has just occurred in the important business locality of Hampstead Road, where the ever-growing business of those well-known furnishers, Messrs. Oetzmann and Co., has necessitated the erection of a new annexe. It extends down Drummond Street, at the side of the familiar premises at 62-79 Hampstead Road, and consists of seven spacious floors crowned by an electrically-lighted cupola. The annexe comprises some fine show-rooms for the Oriental and British carpets and floor-coverings of which Messrs. Oetzmann and Co. have so extensive a stock; two large show-rooms devoted to antique furniture and decorative objects; other spacious show-rooms for modern furniture; and a special show-room in which are hundreds of specimens of reproductions of old carved black oak furniture. As regards pianos, Messrs. Oetzmann & Co. give their customers every facility for making a wise choice, having devoted a large show-room where instruments (both new and second-hand) by all the leading makers can be compared side by side. The top floors are reserved for upholstery and bedding manufacture, and the basement for export packing. Messrs. Oetzmann's stock of furniture is always noted for being cheap, good and artistic, and their establishment is more than ever worth a visit now that they have thus added to their already extensive premises.

Masters and Men.

A Claim by Plasterers was made recently that a trained plasterer should be employed to do the concreting and to lay the blocks of electric-tram tracks at Cardiff. The Public Works Committee, having considered a report on the subject by the borough engineer, has decided in the negative. It was the opinion of the majority of the committee that the work of preparing the tracks can be, and is being, efficiently performed by men who are not plasterers in the ordinary sense, but are styled by the borough engineer "concreters and block-layers."

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the Work.

BEWDLEY.—For the construction of two covered reservoirs, the supply and laying of 9¾ miles of water-mains, the sinking of a well, building engine-house, and for other work connected with the supply of water to Bewdley, for the Corporation. Mr. R. E. W. Berrington, engineer, Wolverhampton:—

Morrison & Mason, Ltd., Polmadie, Glasgow	£15,962	8	9
A. Cooper, Birmingham	14,514	0	0
J. H. Ewart, Warrington	13,685	0	0
W. L. Meredith & Co., Gloucester	13,568	15	9
W. Jones & Sons, Neath	13,289	11	7
J. Mackay, Smethwick	12,867	6	5
Pedrette & Co., Finsbury Park	12,760	0	0
H. Holloway, Wolverhampton	12,700	0	0
A. Jenkins, Southwell	12,094	0	0
G. Law, Kidderminster	11,736	17	11
J. Owens, Wolverhampton	11,499	0	0
E. C. Carden, Penkridge	11,400	0	0
T. Vale, Stourport	11,338	10	0
H. Roberts, Ashford, Ludlow	11,250	0	0
W. H. Reading,* Wolverhampton	10,590	0	0

* Accepted.

BRENTWOOD, Essex.—For the erection of Highwood School, Brentwood, for the Metropolitan Asylums Board:—

Shillitoe & Son, Bury St. Edmunds	£96,687	0	0
W. Wallis, Ramsden Road, Balham, S.W.	90,890	4	0
C. Wall, Ashburnham Works, Lots Road, Chelsea	89,905	0	0
H. Potter, Fairfield Estate Works, Chelmsford	88,706	0	0
E. West, Chelmsford	88,649	0	0
S. Parmenter, Belle Vue, Braintree, Essex	86,650	10	0
McCormick & Sons,* Northampton Street, Essex Road, N.	84,567	0	0

* Accepted.

CARDIFF.—For the erection of a new warehouse in Paradise Place, Cardiff, for Mr. Joseph Spiridion. Messrs. Veall & Sant, architects, Cardiff:—

J. E. Evans	£2,175	0	0	C. C. Dunn	£1,875	0	0
C. Beames & Nephew	2,119	8	3	E. R. Evans, & Bros.	1,853	0	0
H. Gibbon	2,100	0	0	W. T. Morgan	1,850	0	0
G. Hallett	2,040	0	0	J. Thomas	1,845	0	0
G. L. Strachan	1,999	0	0	Price Bros.	1,798	0	0
A. W. Cadwallader	1,979	0	0	Handford & Elsworthy	1,794	0	0
W. Thomas & Co.	1,977	0	0	G. Couzens & Co.	1,781	15	7
S. Shepton & Son	1,965	0	0	Knox & Wells	1,760	0	0
E. Turner & Sons	1,918	0	0	Melhuish Bros.*	1,715	0	0
J. H Venning	1,894	0	0				
J. Allan	1,879	0	0				

* Accepted. [All of Cardiff.]

CARDIFF.—For the erection of a chimney shaft, &c. (160ft. high from floor line), for the electric (tramway) power station at Roath, Cardiff, for the Corporation. Mr. W. Harpur, M.I.C.E., borough engineer:—

R. H. B. Neal, Plymouth	£2,540	0	0
Walters & Johns, Morriston	2,072	18	7
Knox & Wells	1,770	0	0
Chubb & Co.	1,732	0	0
W. Symonds & Co.*	1,626	12	1
Alphons Custodis Chimney Company, Sheffield	1,600	0	0
Clark & Co.	1,563	1	5

* Accepted. [Rest of Cardiff.]

CARLTON, near Nottingham.—For the erection of new engine-house and pump-house at Carlton, near Nottingham, for the Carlton Urban District Council. Mr. R. Whitbread, M.S.A., surveyor, Carlton:—

Barry, Radcliffe-on-Trent	£1,375
Harper, Carlton	1,210
R. Hall, Nottingham	1,120
Pringle, Carlton	1,088
Cooper, Nottingham	1,080
Tegerdine,* Carlton	1,043

* Accepted.

CLEETHORPES, Lincs.—For the erection of the Bursar Street Board Schools, at Cleethorpes, for the Cleethorpes School Board. Mr. F. W Croft, architect, Victoria Chambers, Victoria Street, Great Grimsby:—

Bowman & Son, Stanley Street, Stamford	£11,885	10	0
W. Barton, Thorne, near Doncaster	10,640	10	0
Sime, Burgess Street, Grimsby	10,600	0	0
Thompson & Sons, Victoria Street, Grimsby	10,490	0	0
Hewins & Goodhand, Eleanor Street, Grimsby	10,375	0	0
Wade & Co., Ltd., Cleethorpes	10,177	12	6
H. Marrows,* Garden Street, Grimsby	10,130	8	0

* Accepted.

CULHAM, Oxon.—For the erection of a new wing at the Diocesan Training College, Culham, Oxon. Mr. J. G. T. West, M.S.A., architect, The Knowl, Abingdon:—

Norris & Son, Ascot	£3,400
Organ, Oxford	3,397
Booth, Banbury	3,291
Kingerlee, Oxford	3,224
King, Milton	3,140
Oxford Co-operative, Oxford	2,900
Williams, Abingdon	2,849
Wheeler, Abingdon	2,750
Buckle,* Abingdon	2,690

* Accepted.

DEVONPORT.—For the extension of premises, for Messrs. H. J. & E. A. Boods, at Devonport. Mr. R. Hansford, architect, 42 George Street, Plymouth:—

H. Kerswell, Plymouth	£2,626	18	5
A. Andrews, 8 Evelyn Place, Plymouth	2,258	0	0
T. May, 23 Cobourg Street, Plymouth	2,068	0	0
Lapthorn & Co., Plymouth	1,989	0	0
J. E. Carter, Plymouth	1,900	0	0
W. T. Stevenson, 86 Cobourg Street, Plymouth	1,840	0	0
J. Davy, 7 Young's Terrace, Compton Gifford	1,765	0	0
W. E. Blake,* Salisbury Road, Plymouth	1,729	0	0

* Accepted.

HALE, Cheshire.—For the construction of (approximately) 330yds. of 15in. stoneware pipe sewers, 1,250yds of 12in. stoneware pipe sewers, and 800yds. of 9in. stoneware pipe sewers, together with the necessary manholes, lampholes, flushing valves, and other appurtenant works, for the Hale Urban District Council. Mr. Frank J. Lobley, A.M.I.C.E., engineer:—

H. Davison, Chorlton-on-Medlock, Manchester	£6,610	10	0
G. Bozzon, Ashton on-Mersey	5,790	16	0
J. Rainey, North Scale, Barrow-in-Furness	4,895	18	1
Jowett Bros., Burscough, Lancashire	4,588	14	9
S. Hutton,* Bowdon	4,312	4	8

* Accepted.

HISTON, Cambridge.—For the erection of Baptist Schools. Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, architects, 5 Clement's Inn, Strand, W.C.:—

Estimate A.

J. G. Cowell	£2,489	0	0	William Wade	£1,998	0	0
Oak Building Co.	2,254	0	0	Scales & Robins	1,895	0	0
Ernest West	2,220	0	0	Mr. H. Kirk*	1,803	0	0
Coulson & Lofts	2,119	0	0				

Estimate B.

J. G. Cowell	£138	0	0	Coulson & Lofts	£97	0	0
Oak Building Co.	103	0	0	Scales & Robins	85	0	0
William Wade	99	0	0	Not tendered for.			
Ernest West	97	0	0				

Estimate C.

J. G. Cowell	£46	0	0	Oak Building Co.	£36	0	0
Ernest West	38	0	0	Scales & Robins	33	0	0
Coulson & Lofts	37	16	6	William Wade	27	16	0
Mr. H. Kirk*	36	0	0				

Estimate D.

J. G. Cowell	£24	0	0	Ernest West	£14	16	0
William Wade	23	16	0	Coulson & Lofts	14	9	0
Oak Building Co.	20	0	0	Mr. H. Kirk*	13	0	0
Scales & Robins	16	0	0				

Estimate E.

J. G. Cowell	£20	0	0	Scales & Robins	9	0	0
Oak Building Co.	16	0	0	Ernest West	£6	0	0
William Wade	15	12	6	Coulson & Lofts	6	0	0

* Accepted, total £1,852 [Architect's estimate £1,900.]

ILFORD.—For the erection of a pair of villas for Mr. Wm. Johnson. Mr. S. Doddimeade Edmunds, architect, St. Albans and London:—

J. & H. Cocks, Mile End Road, E.	£1,698
J. R. Cordell & Sons, Clapton	1,163
F. J. Coxhead, Leytonstone	1,050
J. R. Cordell & Sons,* Clapton	930

* Modified and accepted.

LIMERICK.—For the erection of general offices and stores, for the Irish Co-operative Agency Society, Limited. Mr. Brian E. F. Sheehy, C.E., architect, 50 George Street, Limerick:—

J. Kenny	£2,530	18	10	M. Gough,* Colooney Street, Limerick	£2,000	0	0
P. Kennedy	2,504	6	8	* Accepted.			
D. Sullivan	2,355	0	0				

LONDON.—For the erection of a special school for 60 children, removing covered playgrounds, and providing new playgrounds at Brackenbury Road School, for the London School Board. Mr. T. J. Bailey, architect:—

Treasure & Son	£4,280	0	0	Lathey Bros.	£3,916	0	0
J. Simpson & Son	4,096	0	0	Patman & Fotheringham, Ltd.	3,885	0	0
Leslie & Co., Ltd.	3,994	1	8	E. Triggs	3,848	0	0
F. Gough & Co.	3,990	0	0	C. Wall	3,830	0	0
E. Lawrance & Sons	3,970	0	0	Stimpson & Co.*	3,740	0	0
H. Wall & Co.	3,926	0	0				

* Recommended for acceptance.

LONDON.—For works at Calvert Road School, for the London School Board. Mr. T. J. Bailey, architect:—

H. Wall & Co.	£3,275	J. & C. Bowyer	£2,968
Johnson & Co.	3,059	J. Appleby*	2,900
F. & H. F. Higgs	3,043		

* Recommended for acceptance.

LONDON.—For special school and schoolkeeper's house, Riley Street, for the London School Board. Mr. T. J. Bailey, architect:—

E. P. Bulled & Co.	£5,170	W. Downs	£4,708
J. Chessum & Sons	5,090	Johnson & Co.	4,697
H. Wall & Co.	4,914	W. Johnson & Co., Ltd.	4,654
F. & H. F. Higgs	4,895	J. Appleby	4,580
J. & C. Bowyer	4,787	J. Marsland & Sons*	4,440

* Recommended for acceptance.

LONDON.—For rebuilding offices, extending and altering urinal, refitting the lavatories, and providing new drainage scheme at Lewisham Bridge School, for the London School Board. Mr. T. J. Bailey, architect:—

W. Johnson & Co., Ltd.	£2,048	J. & C. Bowyer	£1,494
Martin, Wells & Co.	1,888	E. Triggs	1,450
J. W. Falkner & Sons	1,724	W. V. Goad	1,350
G. Parker	1,599	Peattie Bros.	1,331
G. Kemp	1,496	H. Leney*	1,198

* Recommended for acceptance.

LONDON, S.E.—For the extension and completion of their infirmary in Brunswick Square and Havil Street, Camberwell for the Guardians of St. Giles, Camberwell. Mr. Edwin T Hall, F.R.I.B.A., architect, 57 Moorgate Street, E.C.:—

J. Allen & Sons, Kilburn	£205,065
Willcock & Co., Wolverhampton	203,908
Willmot & Sons, Hornsey	194,879
J. E. Johnson & Son, Leicester	189,849
F. Gough & Co., Hendon	189,000
Shillitoe & Son, Bury St. Edmunds	187,000
Balaam Bros., Old Kent Road	186,000
Kingerlee & Sons, Oxford	185,579
Foster & Dicksee, Rugby	182 828
H. L. Holloway, Deptford	178,428
C. Wall, Chelsea	177,237
Holliday & Greenwood,* Brixton	174,777

* Accepted.

ST. ALBANS.—For alterations and additions to Myrtle Cottage, London Road, for Mr. W. H. Moores. Mr. S. Doddimeade Edmunds, architect, St. Albans and London:—

Whibley & Jervis	£230	0	Goodchild & Sons*	£149	15
J. Hammond & Sons	165	11	* Accepted.		

[All of St. Albans.]

SHENLEY BARNET, Herts.—For the erection of a pair of cottages, for Mr. Thos. Perry. Mr. S. Doddimeade Edmunds, architect, St. Albans and London:—

Boff Brothers, Park Street, St. Albans	£618
Goodchild & Sons,* St. Albans	550

* Accepted at modified rates of £500.

SHIREBROOK, near Mansfield.—For the erection of a chapel for the Primitive Methodist Connexion. Mr. J. Perkin, architect, Shirebrook, near Mansfield:—

A. Eastwood, Warsop, Notts	£957	19
C. G. Percival,* Newcastle Street, Mansfield	780	17
C. E. Nicholls, Cutthorpe, Chesterfield	775	0

* Accepted.

WARMINSTER, Wilts.—For building proposed new technical schools adjoining the Warminster Athenæum, for the Urban Council. Mr. W. H. Hardick, architect, Warminster:—

Kite, Fisherton, Salisbury	£2,380	0	0
Moody, Trowbridge, Wilts	2,150	0	0
Burgess, Westbury, Wilts	2,091	10	0
Parsons	1,991	12	0
Franklin	1,985	0	0
Butcher	1,920	15	0
Gaisford*	1,760	0	0

* Accepted. [Rest of Warminster.]

WALTHAMSTOW.—For the erection of four shops and offices, Wood Street and Wyatt's Lane, for the Trustees of the Walthamstow Parochial Charities. Mr. W. A. Longmore, architect, Bridge Chambers, Hoe Street, Walthamstow:—

F. Parsons	£5,627	15	3	Hood	£3,698	0	0
West Bros. & Pettit	4,600	0	0	Sands, Palmer & Co.	3,550	0	0
Reed	4,379	0	0	T. & W. Baker	3,300	0	0
Barton	4,198	0	0	Ridgway & Sons	2,969	0	0
Snewin	4,198	0	0	Penn	2,775	0	0
R. & E. Evans	3,998	0	0	Dean	2,528	0	0
Silk	3,850	0	0				

WOLVERHAMPTON.—For the erection of additional offices at the electricity works, Commercial Road, for the Lighting Committee. Mr. W. Edwards, architect, 25 Darlington Street Wolverhampton:—

Sheake & Son	£1,443	0	0	G. Cave & Son	£1,339	0	0
L. Jones	1,425	0	0	H. Willcock & Co.*	1,332	18	0
H. Gough	1,354	0	0	* Accepted.			

[All of Wolverhampton.

The new Government Offices.—The foundations of the Government offices to be erected in Whitehall are now practically complete, and the building operations will be begun directly; they are expected to last five or six years.

New Companies.

Bostel Brothers (Worthing), Limited.

Registered March 21st to carry on the business of builders, contractors, painters, glaziers, plumbers, ironmongers, &c. Capital £1,000 in £1 shares.

O'Brien and Co., Limited.

Registered March 14th to carry on the business of gas, steam and water fitting merchants, wholesale ironmongers, contractors, &c. Capital £5,000 in £5 shares. Registered office: 3 Sparrow Corner, Minories, E.

Buildings, Limited.

Registered March 22nd to acquire upon lease certain land at the corner of Easy Row and Edmund Street and to carry on the business of house, land and estate agents, builders, contractors, &c. Capital £10,000 in £10 shares. The first directors are E. Parks, M P., J. Bowen, J.P., E. O. Keay, O. Essex, F. Taylor, J. C. Nicol and J. Goodman.

Regent Estates Company, Limited.

Registered March 14th to carry on the business of buyers and sellers of and dealers in land, houses and other property; as builders, contractors, decorators, stone. timber and hardware merchants, &c. Capital £20 000 in £1 shares. A. Bellingham is to be the first managing director.

Brood and Co., Limited.

Registered March 12th to acquire the business of a company having a similar title (incorporated in 1896) and, generally, to carry on the businesses of brick, lime and cement manufacturers, and gravel and slate merchants, tile, pipe and terra cotta manufacturers, dealers in building materials of every description, &c. Capital £80,000 in £10 shares (4,000 preference).

C. B. N. Snewin and Sons, Limited.

Registered March 12th to acquire the business of a timber merchant carried on by the late C. B. N. Snewin at Back Hill, E.C., and to carry on business as timber merchants, sawmill proprietors and sawmillers, &c. Capital £110,000 in £1 shares. The first directors are H. C. Snewin, E. O. Snewin and F. Oliver. Registered office: 9 Back Hill, Hatton Garden.

Thomas Brood, Limited.

Registered March 12th to acquire the business carried on by Thomas Brood at Gresham House, Great Malvern, Worcestershire, to acquire the business of a builder and brickmaker carried on by G. H. Walker and to carry on the general business of builders and contractors, plumbers and whitesmiths, woodworkers, &c. Capital £10,000 in £10 shares. The first director is C. C. Brood.

Ormrods, Limited.

Registered March 15th to acquire the business of James Ormrod and Sons, Limited (incorporated in 1893), so far as it relates to the business of brick and tile makers as heretofore carried on by them at the Shipton Brick Works, situate off Chorley Old Road, in Halliwell-within-Bolton, Lancashire. Capital £10 000 in £10 shares. Registered office: Shipton Brick Works, Halliwell-within-Bolton, Lancashire.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
	BUILDING.		
April 5	King Cross, Halifax—Shops, &c.	—	Jackson and Fox, 7 Rawson Street, Halifax.
„ 5	Tonypandy, Wales—Alterations, &c.	J. D. Williams	Griffiths and Jones, Architects and Surveyors, Tonypandy.
„ 6	Timberland Dales, Lincs—Chapel	—	G. H. Dowse, Martin Dales, near Lincoln.
„ 6	West Hartlepool—Villa Residence	C. A. Forslind	J. Garry, 47 Church Street, West Hartlepool.
„ 8	Harrogate—Works	Corporation	E. W. Dixon, 14 Albert Street, Harrogate.
„ 8	Brede, Sussex—Villa	—	T. Reid, Conster Manor House, Brede, Sussex.
„ 9	London, S.W.—Building Materials and Tools	Prison Board	Prison Commission Office, Home Office, Whitehall, S.W.
„ 9	Royston, Herts—Additions, &c., to Town Hall	Urban District Council	J. Smith, Hall keeper, Melbourn Street, Royston.
„ 9	Oldham—Public Baths	Corporation	S. A. Pickering, Borough Surveyor, Town Hall, Oldham.
„ 9	Bargoed, Wales—Hotel	—	G. Kenshole, Architect Duffryn, Hengoed, Maesycwmmer.
„ 9	Harpurhey—Alterations	Tramways Committee	City Surveyor, Town Hall, Manchester.
„ 10	Winwick near Warrington—Farm Buildings, &c.	Lancashire Asylums Board	J. P. Muspratt, County Offices, Preston.
„ 10	Limerick—Alterations	Asylums Committee	Carroll and Batchelor, 86 Merrion Square, South Dublin.
„ 10	Sudbury, Suffolk—Police Station and Police Quarters	West Suffolk Standing Joint Committee	F. Whitmore, Architect, Chelmsford.
„ 10	Barry, Glamorgan—Bathing houses	Urban District Council	Surveyor, 160 Holton Road, Barry.
„ 10	Ebbw Vale, Mon—Houses	Briery Hill Workmen's Building Club	O. Newcombe, Laburnum House, Ebbw Vale.
„ 10	Kirkcaldy—Police Buildings	Town Council	Williamson and Inglis, Kirk-wynd, Kirkcaldy.
„ 10	Rotherham—Fireclay Retorts, &c.	Gas Committee	F. A. Winstanley, Gas Engineer, Rotherham.
„ 10	Newcastle-upon-Tyne—New Infirmary Buildings	Royal Victoria Infirmary Committee	W. L. Newcombe, 89 Pilgrim Street, Newcastle-upon-Tyne.
„ 10	Winchmore Hill—Building Materials	Metropolitan Asylums Board	Board Office, Embankment, E.C.
„ 11	Carlisle—Bridge Works, &c.	Committee	W. Hodgson, Local Surveyor, Keswick.
„ 11	Brighton—Villas	Freeholders of the Madeira Estate	Byfield and Son, 3 Stone Buildings, Lincoln's Inn, London.
„ 11	Halifax—Warehouse	—	Jackson and Fox, 7 Rawson Street, Halifax.
„ 11	Tonbridge, Kent—Alterations, &c.	—	J. Fagg, Quarry Bank, Tonbridge.
„ 11	Kingston-on-Thames—Chimney Shaft	Corporation	Borough Surveyor, Clattern House, Kingston-on-Thames.
„ 12	Ebbw Vale, Mon—Houses	Pretoria and Bloemfontein Building Clubs	J. P. Davies, Eureka Place, Ebbw Vale.
„ 12	Hoylake, Cheshire—Lavatories, &c.	Urban District Council	T. Foster, Engineer, District Council Offices, Hoylake.
„ 12	Morecambe—Additions	—	J. Hartley, Architect, Euston Chambers, Morecambe.
„ 13	Sedgefield—Cottage Clocks	Durham County Lunatic Asylum	W. Crozier, Shire Hall, Durham.
„ 13	Leeds Rooms	New Station Committee	W. Bell, North-Eastern Railway Company's Architect, York.
„ 15	Vnyshir, Wales—School Works	Ystradyfodwg School Board	J. Rees Hillside Cottage, Pentre.
„ 15	Eastbourne—Pavilions, &c.	Corporation	W. C. Field, Borough Architect, Town Hall, Eastbourne.
„ 15	Wigan—Additions	Corporation	W. Bolton, Borough Engineer, Rodney Street, Wigan.
„ 15	Leeds—Bird Market	Corporation	City Engineer's Office, Municipal Buildings, Leeds.
„ 16	Ballymacreely, Ireland—Villa	—	W. J. Fennell, Scottish Provident Buildings, Belfast.
„ 16	Evesham—Culverts	Rural District Council	E. Wadams, Union Offices, Evesham.
„ 16	London, N.—Renovation, &c.	—	Vicarage, St. John's Church, Highbury Vale.
„ 16	Llanbradach—Hotel	—	Teather and Wilson, Andrew's Buildings, Queen Street, Cardiff
„ 16	Devizes, Wilts—Laundry	County Pauper Lunatic Asylum	C. S. Adye, County Offices, Trowbridge.
„ 16	Harrow—Schools	United District School Board	Houston and Houston, 5 York Buildings, Adelphi, W.C.
„ 18	Cleethorpes—Schools	School Board	F. W. Croft, Victoria Chambers, Victoria Street, Great Grimsby.
„ 18	Belfast—Timber Jetties	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
„ 18	Dundee—Seawall	—	W. Mackison, 91 Commercial Street, Dundee.
„ 19	Culcheth near Kenyon Junction—Cottage Homes, &c.	—	H. Lord, 42 Deansgate, Manchester.
„ 20	Merthyr Tydfil—Cottages	Lancs Building Club	E. A. Johnson, Architect, Merthyr.
„ 20	Carrickfergus—Houses	Governers of the Charles Shells Charity	Young and Mackenzie, Scottish Provident Buildings, Belfast.
„ 20	Cressing, Essex—School Buildings	School Board	Clare and Ross, 66 Duke Street, Chelmsford.
„ 23	London, S.W.—New War Office, Whitehall	Commissioners of H.M. Works, &c.	Sir John Taylor, H.M. Office of Works, Storey's Gate, S.W.
„ 24	Clowne, Derbyshire—Lock-up	Standing Joint Committee	J. S. Story, County Offices, St. Mary's Gate, Derby.
„ 25	Sunderland—Workmen's Dwellings	Corporation	Borough Surveyor's Office, Town Hall, Sunderland.
„ 26	New Clee—Schools	Great Grimsby School Board	H. C. Scaping, Architect, County Chambers, Grimsby.
„ 30	Sunderland—Villas, &c.	County Borough Asylum at Ryhope	Borough Surveyor's Office, Town Hall, Sunderland.
	ENGINEERING.		
April 5	Pentybont, Wales—Waterworks	Rural District Council	J. Hurley and Son, 10 Bridgend Road, Aberkenfig.
„ 6	Christiania—Telegraph Wire, &c.	State Telegraph Department	Technical Department, Telegraph Office, Christiania.
„ 6	Christiania—Telegraph wire, &c.	Norwegian State Telegraph Department	Technical Department, Telegraph Office, Christiania,
„ 8	Farnworth, Lancs—Tramway track	Urban District Council	W. J. Lomax, 11 Fold Street, Bolton.
„ 9	Salford—Wiring for motors, &c.	Corporation	Lacey, Clirehugh and Sillar, 2 Queen Anne's Gate, Westminster.
„ 9	Partick, Scotland—Plant	Provost, Magistrates and Councillors	J. Donaldson, 97 West Regent Street, Glasgow.
„ 10	Barnstaple—Waterworks	Rural District Council	Beesley, Son & Nichols, 11 Victoria Street, Westminster, S.W.
„ 10	Rosario—Harbour Works	Argentine Government	Commercial Department, Foreign Office, S.W
„ 11	London, N.—Plant	Hornsey Urban District Council	R. Hammond, 64 Victoria Street, Westminster, London, S.W.
„ 11	Lochearnhead, Scotland—Railway	Railway Company	Crouch and Hogg, 53 Bothwell Street, Glasgow.
„ 12	Brighton—Extension of concrete groynes	Town Council	F. J. C. May, Town Hall, Brighton.
„ 12	Dundee—Hatch boxes, &c.	Water Commissioners	G. Baxter, 93 Commercial Street, Dundee.
„ 12	Seville, Spain—Bridge of boats	His Majesty's Ambassador	Commercial Department, Foreign Office, Seville, Spain.
„ 13	Wolverhampton—Heating and electric lighting schools	School Board	T. H Fleeming, 102 Darlington Street, Wolverhampton.
„ 15	Kirkcaldy, Scotland—Plant	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„ 15	Leeds—Pipes &c.	Lighting Committee	H. Dickinson Whitehall Road, Leeds.
„ 15	Aberdeen—Fuel Economiser, &c	Electric Lighting Committee	J. A. Bell, Cotton Street, Aberdeen.
„ 15	Wimbledon—Cable, &c.	Urban District Council	Electric Lighting Works, Durnsford Road, Wimbledon.
„ 15	Warrington—Pumping	Corporation	J. Deas, Municipal Offices, Warrington.
„ 15	Ampthill, Beds—Boring	Urban Council	George and F. W. Hodson, Loughborough.
„ 15	Hindley—Purifiers, &c.	Gas Committee	Manager, Gas Works, Hindley.
„ 17	Cranleigh, Surrey—Sewage purification works	Hambledon Rural District Council	E. L. Lunn, 36 High Street, Guildford.
„ 17	West Ashford—Heating workhouse	Union Guardians	Young and Brown, 7 Southampton Street, Bloomsbury Square, W.C.
„ 17	Chatham—Steel Bridge	Town Council	A. T. Walmisley, 9 Victoria Street, Westminster.
„ 18	Upleadon, near Newent, Glos—Reservoir	Corporation	R. Read, City Surveyor, Guildhall, Gloucester.
„ 21	Palencia—Telephone System	Spanish Government	Commercial Department, Foreign Office, Palencia,
„ 22	Glasgow—Bridge	Caledonian Railway Co	Engineer, Buchanan Street Station, Glasgow.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	Engineering.—*Continued.*		
April 22	Dublin—Plant	Corporation	S. Harty, City Hall, Dublin.
„ 23	Oswestry—Light Railway	Cambrian Railways Co.	A. J. Collin, Oswald Road, Oswestry.
„ 24	London, S.W.—Plant	Metropolitan Asylums Board	Handcock and Dykes, 1 Victoria Buildings, Westminster, S.W.
„ 26	Brighton—Iron and Steelwork	Town Council	F. J. Tillstone, Town Hall, Brighton.
	IRON AND STEEL.		
April 8	Pietermaritzburg, Natal—Water Pipes	Corporation	Ford Brothers, 12 Southampton Street, Fitzroy Square, London.
„ 8	Manchester—Iron Castings, &c.	Lancs. and Yorks. Railway Co.	Stores Department, Osborne Street, Manchester.
„ 9	Christiania—Rails	Norwegian Main Railway Administration	Commercial Department, Foreign Office, Christiania.
„ 10	Christiania—Points	Norwegian State Railway Administration	Railway Director's Office, Christiania.
„ 10	Christiania—Points	His Majesty's Consul-General	Styrelsens Expeditionskrontor, Statsbanerne, Christiania.
„ 12	Valletta, Malta—Pipes, &c.	—	Public Works Department, Malta.
„ 15	Birmingham—Pipes, &c.	Corporation	J. Mansergh, 5 Victoria Street, Westminster, London, S.W.
„ 17	Christiania—Fishplate Screws, &c.	Norwegian State Railways	Railway Director's Office, Christiania.
„ 18	East Ham—Fencing, &c.	Urban District Council	A. H. Campbell, Public Offices, Wakefield Street, East Ham.
„ 19	Valletta, Malta—Pipes	—	Public Works Department, Malta.
	PAINTING AND PLUMBING.		
April 8	Manchester—Lead and Oil, &c.	Lancs. and Yorks. Railway Company	Stores Department, Osborne Street, Manchester.
„ 9	Royston, Herts—Painting, Decorating, &c., Town Hall	Urban District Council	J. Smith, Hallkeeper, Melbourn Street, Royston.
„ 10	Ventnor—Painting Pier	Pier Committee	E. J. Harvey, Urban District Council's Surveyor, Town Hall, Ventnor.
„ 12	Conway—Painting	Joint Water Supply Board	T. B. Farrington, Trinity Square, Llandudno.
	ROADS AND CARTAGE.		
April 6	Loughton, Essex—Granite	Urban District Council	J. H. Hayward, Council Offices, Loughton.
„ 8	Warwick—Street	Town Council	E. M. Richards, 20 The Butts, Warwick.
„ 8	Abergavenny—Limestone, &c.	Rural District Council	J. H. Farquhar, Clerk, Abergavenny.
„ 8	Cheadle, near Manchester—Materials	Urban District Council	E. Sykes, 9 High Street, Cheadle.
„ 8	Chester le Street, Durham—Materials	Rural District Council	G. W. Ayton Highway Surveyor, Chester-le-Street.
„ 9	Bromley, Kent—Materials	Urban District Council	Council's Offices, Bromley, Kent.
„ 9	Withdean, near Brighton—Roadway, &c.	Trustees of the Withdean Estate	Jenkinson and White,1 Princes Street, Westminster, S.W.
„ 9	Aboyne, Aberdeen—Quarrying, &c.	—	J. Milne, District Surveyor, Aboyne Road.
„ 9	Portsmouth Compressed Asphalte Pavement	Town Council	A. Hellard, Clerk, Town Hall, Portsmouth.
„ 10	Tenterden—Quartzite	Town Council	W. L. C. Turner, Borough Surveyor, Town Hall, Tenterden.
„ 10	Canterbury—Materials, &c.	Roads and Survey Committee	A. C. Turley, 45 High Street, Canterbury.
„ 10	Hemel Hempstead - Materials	Corporation	W. R. Locke, Borough Engineer, Town Hall, Hemel Hempstead.
„ 11	London, N.W.—Road-making and Paving Works	Willesden District Council	O. C. Robson, Engineer, Council Offices, Dyne Road, Kilburn, N.W.
„ 13	Walsall—Kerbs, &c.	Rural District Council	F. W. Magor, Engineer and Surveyor, Aldridge, Walsall.
„ 13	Whitby—Quarrying, &c.	Rural District Council	J. Syth, District Surveyor, Whitby.
„ 15	Sutton Bridge, Lincs Road Materials	Urban District Council	Surveyor to the Council, Sutton Bridge.
„ 15	Hoylake, Cheshire—Materials	Urban District Council	L. G. Dashper, District Council Offices, Hoylake.
„ 15	London, S.E.—Water Vans	Bermondsey Borough Council	R. J. Angel, Borough Surveyor, London, S.E.
„ 15	Selby—Whinstone, &c.	Urban District Council	B. M. Gray, Town Surveyor, Town Hall, Selby.
„ 15	Wickham Market Suffolk—Materials	Rural District Council	T. W. Read, Clerk, Wickham Market.
„ 18	Woolwich—Water Vans	Borough Council	F. Sumner, Borough Engineer and Surveyor, Maxey Rd., Plumpstead.
	SANITARY.		
April 6	Lossiemouth—Drainage Works	—	J. Wittet, 81 High Street, Elgin.
„ 8	Burnley—Sewage Works	Corporation	Borough Surveyor, Burnley.
„ 8	Barrow-on Humber—Nightsoil Collection	—	— Stoker, Clerk to the Parish Council, Thornton Street, Barrow.
„ 9	Woodford-cum-Membris, Northants—Sewage Works	Rural District Council	J. B. Williams, Moot Hall, Daventry.
„ 9	Leeds—Lime	Gas Committee	R. T. Townsley, General Manager, Gas Offices, Leeds.
„ 10	Banbury—Drain, &c.	Rural District Council	H. Gander, Surveyor, Paignton Villa, Bath Road, Banbury.
„ 10	Brightingsea, Essex—Removal of Refuse	Urban District Council	W. I. Osborne, Clerk, Foresters' Hall, Brightlingsea.
„ 11	Caistor, Lincs—Drainage, &c.	Guardians	J. Hewins, Eleanor Street, Grimsby.
„ 15	Sevenoaks—Storm Water Pipe Drain	Urban District Council	T. Hennell, 6 Delahay Street, Westminster.
„ 15	Ellesmere Port, near Chester—Sewers, &c.	Wirrall Rural District Council	Beloe and Priest, 13 Harrington Street Liverpool.
„ 16	Oradley Heath—Sewers	Quarry Bank Urban District Council	W. Fiddian, Old Bank Offices, Stourbridge.
„ 17	Cranleigh, Surrey—Outfall Sewer	Hambledon Rural District Council	E. L. Lunn, 36 High Street, Guildford.
„ 18	Blackburn—Sewage Conduit	Sewage Committee	W. Stubbs, Municipal Offices, Blackburn.
„ 20	Acome, Yorks—Sewers, &c.	Great Ouseburn Rural District Council	F. S. Capes, Clerk, Borough Bridge, Yorks.
„ 23	Tanfield, Durham—Sewers, &c.	Urban District Council	R. Heslop, Surveyor, Burnopfield, R.S.O.
	TIMBER.		
April 8	Manchester—Timber	Lancashire and Yorkshire Railway Co.	Stores Department, Osborne Street, Manchester.
„ 10	Army Contracts, York—Wood	—	Assistant Adjutant-General, North-Eastern District, York.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
April 30	Keighley—Public Library	£50, £30, £20	W. H. Hopkinson, Borough Engineer, Town Hall, Keighley.
June 10	Ennis, co. Clare—Additions, &c., to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
„ 24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100 respectively	W. H. Talbot, Town Clerk, Town Hall, Manchester.
„ 24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
No date	Gillingham—School	£10, £5	E. T. Atchison, 28 Waterloo Road, New Brompton.
No date	Darlington—Row of Shops and Dwelling Houses	—	Borough Surveyor, Town Hall, Darlington.

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THE BVILDERS' JOVRNAL & ARCHITECTVRAL RECORD

April 10, 1901.
No. CCCXXII.

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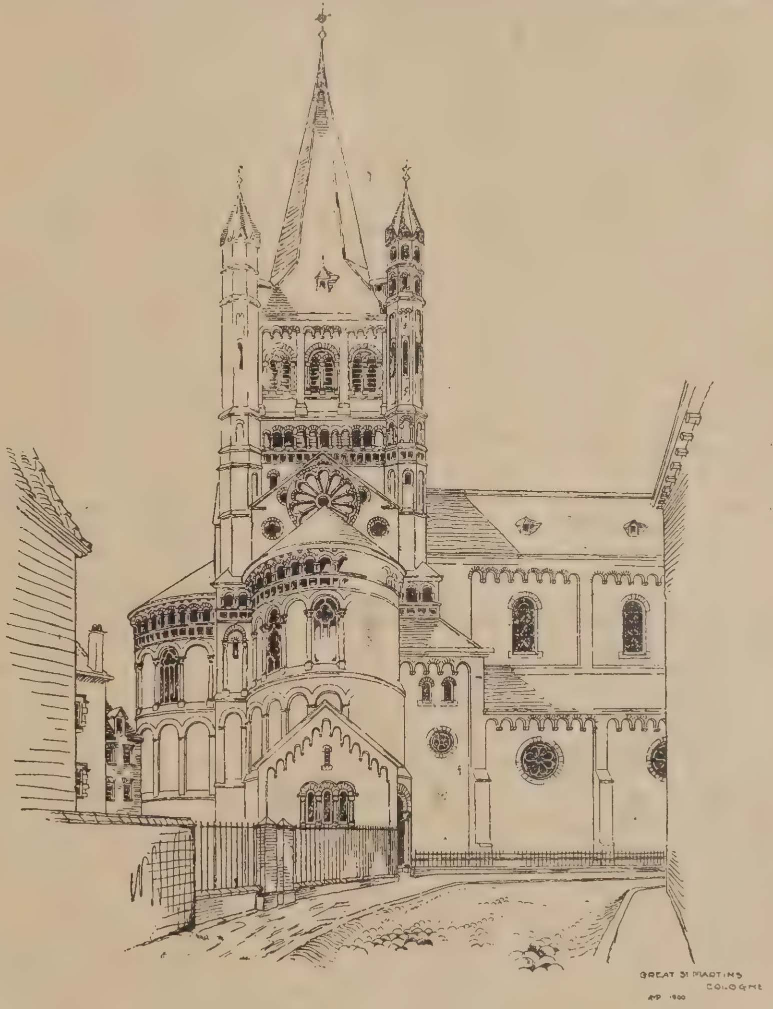
Effingham House, Arundel St., Strand, W.C.

An Architectural Causerie.

Done. When the schemes for tampering with St. Dunstan's Church, Fleet Street, and St. Martin's Church, Trafalgar Square, were first proposed we protested strongly against them and pointed out how they would disfigure those two buildings. Since then the "improvers" have carried out their work. Of the two, St. Dunstan's Church has fared much the worse, for the adjoining insurance offices have now been extended over its western forecourt, the new light-coloured stonework abutting against the weathered tower and entirely spoiling its lines. There, in Fleet Street, is a glaring example of vandalism, one of which the insurance company should be ashamed; but we doubt not that they will consider "business requirements" a justification for anything. At St. Martin's Church the contractors are busy completing the alteration of the steps. It would be extreme to say that they have spoiled the western setting, but they certainly have marred it, and done so when there was really no need. A small strip has been added to the pavement at the expense of the landing which was such a pleasing characteristic of the steps of Gibbs' church. It is needless to dilate on this matter now. The steps have been altered. We simply record the fact. The pity of it is that an influential council in the world's greatest city should be so indifferent about those few buildings under its care which can justly lay claim to architectural merit.

St. Martin's, Cologne. The sketch of St. Martin's Church, Cologne, illustrated on this page, was made by Mr. A. M. Peart whilst on one of Mr. Middleton's Easter tours in Belgium. The date of the building is 1150-70. Another drawing by Mr. Peart, made on the same tour, of the church of St. Pierre, Louvain, was reproduced in our issue for October 17th last.



DRAWN BY A. M. PEART.

Sash Fasteners. Good Sir Francis Bacon affirmed that those who are prone to invent are also prone to believe, and the saying will be held sadly true by those who know something of the vagaries of inventors. There are many kinds of articles and devices which form every year the subjects of useless patents, and of these, sash fasteners may be taken as an example. Month after month prolific minds devise these articles and waste their money on patenting them. We would wish it were otherwise and that those microcosms of ingenuity were first put to the comparative test of a search at the Patent Office, for this (provided it is thoroughly done) is one of the best methods of showing the force of Solomon's remark "that there is nothing new under the sun" and also of showing what fallacies are pursued by inventors and what wild-goose chases they are led into. There have already been so many sash fasteners invented that not only is it exceedingly difficult to think of any genuine improvement, but manufacturers and retail salesmen look askance at all newcomers, and smilingly point to the numerous packets of the old snap fasteners that still find the readiest market; in fact, the representative of a well-known firm told us recently that the illustrations of American and similar "fancy" fasteners in their catalogue were simply put there with the object of making a good "show," but that they very rarely sold any of them! A few years ago several prominent newspapers in various parts of the country—we forbear to mention names—implicated themselves in a competition for a good sash fastener which, though it doubtless brought money into the coffers of the particular patent-agents concerned, did considerable harm by adding hundreds to the already ridiculously large number of patents for these window fittings. We have already pointed out in these columns that the proper way to approach invention is not to rush pell-mell into the patent-agent's arms with an utterly useless device, but to first ascertain a need, then determine what has already been done to fulfil it, and then develop your own idea. Though it sells so readily, there is little doubt that the old form of sash fastener is deficient in many respects, and makers are continually being flooded with offers of new devices. A few they adopt, sometimes successfully, often without profit to themselves. And thereby hangs a tale. We would therefore urge all those who are persuaded they have a good invention to look well into the matter, in the manner suggested, before spending money on provisional or final protection. About a week ago, in the House of Commons, Mr. Herbert Lewis asked the Chancellor of the Exchequer whether it was a fact that British patents "are taken out at the risk of the applicants, it being left to every person to protect his own rights," and whether "Great Britain is the only country which issues patents without satisfactory proof that the inventions described have not been previously patented." Mr. G. Balfour replied for Sir M. Hicks-Beach. After remarking that there "certainly are countries other than Great Britain which make no search for novelty," he added: "The subject of search among prior specifications has, however, engaged the attention of the Board of Trade, and I would refer the hon. member to the report of a Departmental Committee presented to Parliament this Session." This committee recommended that an investigation should be made to ensure that the granting of a patent is a guarantee of novelty, as in America. But till that happy state is arrived at, inventors need to exercise particular care.

THE ARCHITECTURAL SURVEY.*

A SCOTTISH SCHOLARSHIP.

By ANDREW MUIR.

THE word "survey" brings to the mind of most people a vision of lines of red and white poles and sundry Government officers with theodolites and measuring chains. But with these the Architectural Survey has no connection. It is a scholarship given annually to two students of the School of Applied Art in Edinburgh for the study of Scottish art throughout Scotland. It is nearly six years since this scholarship was begun, and nine students have now been employed in making this most interesting record of national art. These are primarily students of architecture; they should also be photographers, cyclists, good steeplejacks, able to erect a scaffold, make a cast, or turn their hand to anything that may be required to be done in the way of their work. A large part of Scotland has now been gone over, chiefly the Border districts; last year Ayrshire, Lauder, Jedburgh, Stirling and Iona were visited.

I will endeavour to give a summary of the most interesting points in connection with these places, as it is impossible in the time at my disposal to give anything like a complete description of them.

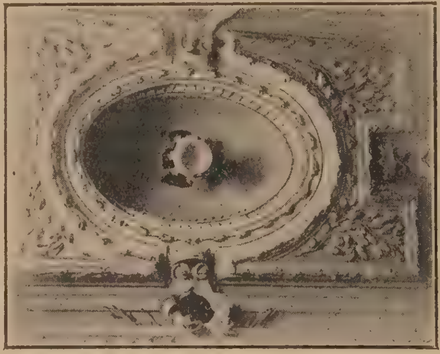
We began our wanderings in April after a preliminary visit to the sweet-scented district of Auld Reekie known as the Cowgate.

This was, in the days of the first six Stewarts, one of the most fashionable and aristocratic quarters in Edinburgh, but it has now fallen from its high estate. Nevertheless, many interesting relics and memories of bygone prosperity remain, though they are being gradually removed.

Here is the chapel of St. Mary Magdalene, whither we went to copy the four stained-glass panels, which are the only fragments of pre-Reformation ecclesiastical coloured glass remaining in Scotland. The chapel was founded in 1503 by a burgess of the city, Michael Macquhen, and his wife Janet Rynd.

A Maison-Dieu was previously built on the site, which, having become ruinous, was superseded by this chapel and hospital, dedicated to Mary Magdalene. The chapel was left in trust to the Corporation of the Hammermen.

The initials of the founder and foundress are seen in the lower panels of the window, and above are the arms of Mary of Guise, and the Scottish lion.



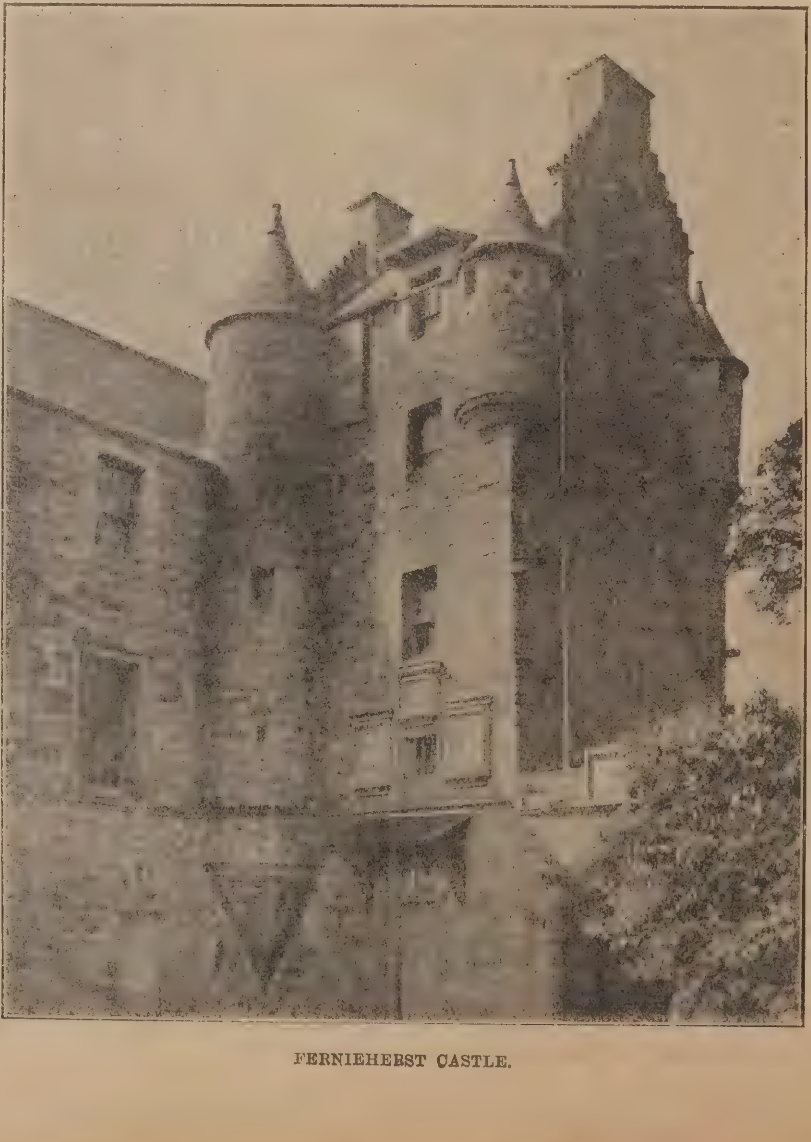
STAIRCASE CEILING, THIRLESTANE CASTLE.

Several objects of interest are in the chapel. The bell, which is still rung weekly, is said to be nearly pure silver, and was cast in Flanders and hung in 1632. There is an inscription on it:

SOLI . DEO . GLORIA . MICHAEL . BURGERHUYS . ME . FECIT . 1632;

and below,

God Bliss the Hammermen of Magdalene Chapel.



FERNIEHERST CASTLE.

Two chairs, marked Clerk and Treasurer, are still in the room under the tower. These would be used at the meetings of the Hammermen's Guild. There is also a tomb inscribed with Gothic lettering which is at present covered in with a wooden platform, and it has been suggested that this may be the top of an altar which would be uncovered were the platform removed. The walls are covered with curious wood panels on which are painted the names of those who left money to the Guild.

Having spent a few days in these historic but somewhat sooty surroundings, within sound of a gasping gas-engine, we journeyed to Ayrshire and the land of Burns. Here we found delightful quarters at Old Cumnock, and rode daily from there to Dumfries House, a seat of the Marquis of Bute. This is an eighteenth-century mansion, built by the Brothers Adam, and contains several plaster ceilings of that period, somewhat French in style. We measured these, and made this the centre for a number of interesting rides, architectural and otherwise.

We visited the sweet Vale of Afton, made famous by Burns, and found it altogether worthy of his praise. One of our tours brought us to Cessnock Castle, near Galston, originally called Galston Tower. The present house is Renaissance of the seventeenth century, and possesses a considerable amount of detail. There are two staircases in the angles of the quadrangle. That in the south-east angle is octagonal, finished with a balustrade on the top, and contains the entrance doorway with a pediment and panel over it. The hall is on the first floor, and has a fine oak ceiling with open beams and boarding painted with figures and Renaissance designs.

The colours of these are low-toned—red, black, and green—the faces and busts being a flesh colour. There are also parts of a plaster ceiling which have been taken down and placed in another apartment. These are very Scotch in character, and belong to the naturalistic style so much employed in the seventeenth century. One of them is dated 1680.

On another occasion we visited the town of Mauchline, famous for its three belles. We did not see the belles, but we saw the old tower, part of a fifteenth-century priory of the monks of Melrose.

Our next centre was the old-fashioned town of Lauder. Hidden away among the hills it seems to have got behind the rest of the world, and many of its customs and ways belong to a bygone age. Thirlestane Castle, the seat of the Earls of Lauderdale, is close to the town. It was probably built in the seventeenth century and is of a most unusual plan, consisting of a long narrow building with four large round towers, one at each corner. Accompanying each of these round towers is the stair turret in the angle, such as is in many L plans. Between these large towers are three turrets on each side, the two centre ones enclosing staircases. This plan is quite unique. Elcho and Kelly are somewhat similar, but there the turrets are placed irregularly. The first floor contains an ante-room or hall, dining-room, drawing-room and bed rooms; and it is with these rooms that we are particularly interested, for they contain some of the finest plaster ceilings in Scotland. Pennant refers to Thirlestane Castle as having been heavily stuccoed by the Duke of Lauderdale in the time of Charles II. The work, like that at Holyrood Palace, is hand-wrought and infinitely varied in design. Each leaf is separately moulded and stuck on; in many cases the finger mark can be seen where it has been pressed into position. Some of the ceilings are rather overcrowded with ornament, though the detail is very good in itself, but the smaller ones are fine examples of this style of work. Many of the ornaments and parts of the design are almost identical with those used at Holyrood, and it is very probable that the same workmen were employed at both places.

The village church, in its quaint old kirkyard, is worth looking at. Its plan is a small Greek cross.

There are not many other architectural features in the immediate vicinity, excepting peel towers.

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* A paper read before the Edinburgh Architectural Society on December 19th, 1900.

IONA ABBEY.

We visited Melrose Abbey one evening—not by moonlight, however. Removing our camp southwards, we next pitched at Jedburgh. This is an excellent centre for visiting the Border abbeys, being within easy distance of Melrose, Dryburgh and Kelso, and other interesting early remains, such as Edrom and Chirnside. Jedburgh itself is a delightful town, lying in its narrow valley, "the strength of Teviotdale," and almost like an English hamlet in its surroundings. Here we devoted our attention almost entirely to the Abbey, and measured the west front, including the fine Norman doorway, one of the best specimens of the period in Scotland. David I., while yet Prince of Cumbria, founded here a Priory of Canons from St. Quentin Beauvais, in 1118. In 1147 the priory was made an abbey, and it was then that the Norman portion of the present building was erected. The priories of Canonby, Dumfriesshire, and Restennet, Forfarshire, were dependencies of Jedburgh, and before the end of the twelfth century the churches of Ancrum, Longnewton, Oxnam, Eckford, Crailing, Nisbet, Hobkirk and Liddell were under it. The abbey was dedicated to the Virgin, and was richly endowed by David I. and the nobles of the district. The oldest parts of the building are the choir and west front. These are the only portions remaining of the twelfth-century building. The abbey was either set out in Norman times and not completed till later, or it was destroyed and had to be restored in the Transition style. The south doorway to the cloisters is also Norman, and there are remains of Norman transepts. The west end is Norman work to the top of the clerestory walls, above which the gable and wheel window have been added at a later period. The west doorway is a very rich specimen of late Norman work, and is very interesting as showing in its mouldings the early beginnings of the Transition style. The expedient has been here resorted to of thickening the wall at the doorway to a kind of porch, to give a feeling of depth and solidity to the front, which it needs, as the buttresses and window jambs are very shallow. The doorway jamb has contained five free shafts, between which are the usual late Norman chefron, chain-mould, and figure panels. The beginning of the dog-tooth ornament can be seen in a star-like ornament running round one of the members of the arch-mould. The porch is finished with three gablets containing niches, with trefoiled arches. The wall on each side of the west window has been divided into three panels by long detached shafts tied to the wall at intervals, but these have almost all fallen away. The stone is in a very soft condition, and in a few years the mouldings will be washed almost completely away.

We also measured the house opposite Smith's Wynd, where Queen Mary stayed while in Jedburgh, and where she suffered the fever which so nearly ended her life. The plan has been considerably altered, but the elevations are still well preserved. It is probable that the house was built after Jedburgh had been destroyed by Surrey in 1523.

Fernieherst Castle lies about two miles up the Jed, picturesquely situated above a narrow gorge and surrounded by woods. The present building was built by Andrew Ker in 1598, on the site of an older fortress, which had seen many a hard fight when the blue bonnets encountered our friends "the enemy over the border." This sixteenth-century house possesses many quaint and useful details.

Next we visited Stirling. The rock is crowded with buildings more or less interesting—the mint, the parliament hall, the chapel royal, about all of which tales more or less authentic are poured into the usually listless ear of the man in the large check tweed.

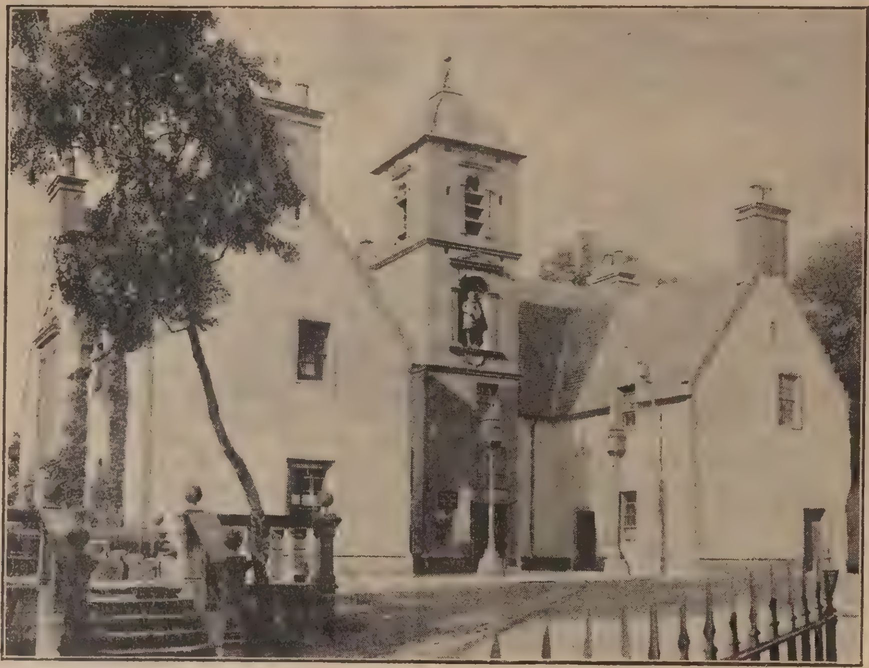
The palace itself is more curious than beautiful, though taking it as a whole it has certainly a rich and striking effect. It lies at the south-west corner of the castle rock, and surrounds a square courtyard called the Lion's Den. Lions were kept by James IV. for the amusement of his court.

The entrance to the palace is from the upper courtyard, and is on the first floor. The principal rooms are ranged round the quadrangle, each occupying the whole width of the building. Beyond the reception room is the audience chamber, and through this again are the private apartments of the king, now used as a mobilization store. On the west of the quadrangle there is a corridor leading to apartments on the south and east sides, and probably intended to communicate with future buildings on the west. The rooms on the south and east have been the salon, the dining hall, and the private apartments of the Royal Family. (I may say here that I am indebted for much of this information to Messrs. MacGibbon and Ross, in their exhaustive work on "Scottish Domestic and Castellated Architecture.") These rooms seem to have been richly decorated, probably with tapestry and wood panelling. A few panels from the ceiling of the presence chamber are preserved in the Smith Institute, Stirling, and the Antiquarian Museum, Edinburgh. They represent Scots worthies, both men and women, not beautiful, but no doubt good. Some of the designs in the spandrels of these panels are exceedingly fine. The rooms in the basement have been mostly used as cellars, and form a sort of Chinese puzzle to the bewildered but conscientious student who wishes to set off the correct angles, &c., but cannot find two parallel walls to start with. The upper floor was originally lighted with dormers behind the parapet, but these have been removed, and the present large windows cutting into the cornice substituted.

CAP, IONA ABBEY.

The exterior of the palace is interesting as being the earliest example of the introduction of the Renaissance style into Scotland. The flat, arched recesses, enriched with cusped work, have a Gothic feeling, while in the round and baluster-shaped columns, and in their caps and enrichments, we have clear evidence of the Renaissance style. The mode in which the statues are placed upon the building, set in shallow niches, is Gothic rather than Classic, but in the grotesque figures themselves there is evidently a rude attempt to copy some of the antique models. The four figures on the south side represent Scottish soldiers—one bending his cross-bow, another taking aim, a third bearing a sword, and a fourth with a fanciful shield. The other figures are coarse but bold and effective grotesques. These figures have a distinctly French feeling,

THE CLOISTERS, IONA ABBEY.



COWANE'S HOSPITAL, STIRLING.

and were probably the work of men whom James V. brought over after his marriage and stay in France. The cusped work round the arches, the Renaissance details mixed with Gothic forms, and the free use of sculpture are all features which were much in vogue in France at the time of the king's visit, and we may see in this palace an attempt to reproduce the same kind of work which he had admired at Loches and Blois. But the Renaissance work here introduced is far in advance of the style generally in use in Scotland. It was not till fifty years later that the Renaissance style became common, and then it was very inferior to that of Stirling. The square tower at the south-west corner is older than the palace, which has been built on to it so that the windows avoid it, and a staircase runs from top to bottom of the tower. The joint can still be distinctly traced where the tower meets the palace wall. It was probably a tower on the old castle wall. This outer wall is connected to it, and the style both of it and the wall is older than that of the palace. When the palace was erected the space between it and this outer wall was built over so as to form a kind of terrace at the level of the battlements which could be used either as a battery or a promenade. Indeed it seems to have been used for the former purpose when General Monk was storming the castle, as the wall behind is riddled with shot-holes.

Having completed the measuring of the palace we spent a few days taking photographs of buildings in the town. One of the best preserved of these is the Guild Hall or Cowane's Hospital, built by John Cowane in 1639 for the "Intertainment of decayed Gild Breither." It stands near Greyfriars. Close to the castle is Argyle's lodging, now used as a military hospital. It was begun in 1632 by Sir William Alexander, and completed about 1674 by the Argyle family. The town abounds in quaint old houses, crow-stepped gables, and dormers galore. Queen Mary had a house here, as usual. The Town Hall is a fine specimen of the seventeenth-century Renaissance in Scotland. But in spite of all its quaint delights, Stirling is not a pleasant place to work in—at least we found it so, and former students of the Survey seem to have had the same experience.

We were glad when we heard that our next move was to the "green lonely isle" of Iona. We travelled to Iona via the Crinan Canal and Oban, where we stayed overnight. This little island of Iona must always be full of special interest to Scotsmen. St. Columba came in 563 A.D., an exile from his native land of Ireland, to found his little colony here, and through the dark ages that followed, in spite of many interruptions, his zealous followers went through Scotland bearing the word of truth.

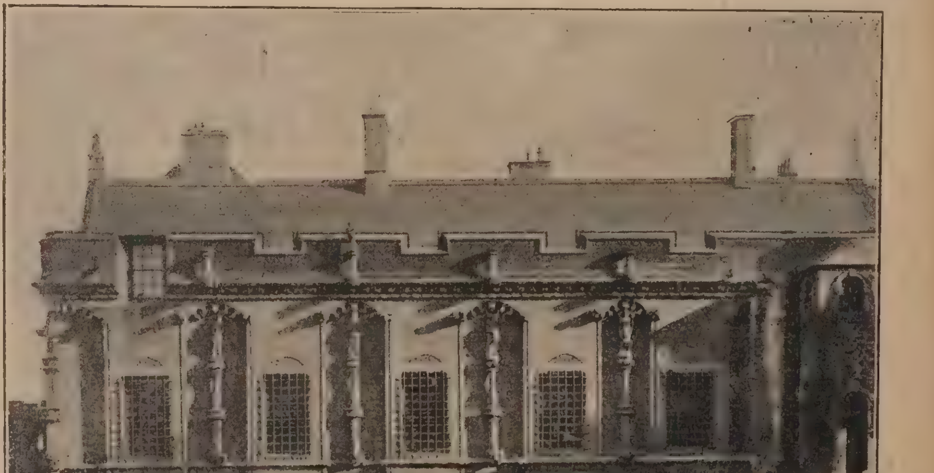
St. Columba's buildings were made of wattles and clay, and have long since disappeared, though the vallum or dyke which surrounded the monastery is still distinctly seen. But stone buildings of a later period, dating from about 1200 to 1400 A.D., still exist. The interest of the island centres round the Abbey, the Nunnery, and the Reilig Oran. The Nunnery, which was a Benedictine establishment, was founded in 1203 by Reginald, Lord of the Isles, whose sister was the first prioress. The Reilig Oran, or burial-ground of St. Oran, lies to the south-west of the Abbey, and contains more than forty tombs of Scottish, Irish and Norwegian kings and chiefs and church dignitaries. Both here and at the Nunnery are many slabs carved with beautiful Celtic patterns, showing a great amount of artistic feeling. These are an endless source of research and curiosity to the antiquarian, and might suggest some useful schemes of ornament to the designer.

St. Oran's chapel, called after one of St. Columba's followers, lies to the north-east of the burying-ground. It is supposed to have been erected in 1074 by Queen Margaret. It has a pleasing little doorway of Norman character at the west end.

The Abbey itself is full of interest, both to the antiquarian and the architectural student. There are at least four different periods of building, the earliest dating from about 1200, when Reginald, King of Argyll, rebuilt the monastery; but most of the church is late Decorated work, about 1400. The whole building is a patchwork of different periods, and as the same materials have been used throughout it is difficult to ascertain the exact dates.

The monastery has consisted of a church, with nave, transepts, choir, and south aisle, the cloisters lying to the north, while round them are grouped the chapter-house, library, parlour and dormitories, lavatory and refectory. We will go round these buildings and examine their various points of interest.

The first object that attracts our attention on approaching the Abbey is the famous St. Martin's Cross. It is covered with raised circles, and serpents twining amongst them. The origin of the circle enclosing the arms of the cross is supposed to be the remnant of the **P** loop in the well-known symbol, but this is doubtful. There are the remains of two other crosses, and a well near the west doorway, and also the supposed site of the shrine of St. Columba and his servant Diarmid. A curious hollowed stone lies near the west doorway, looking like a drinking-trough. This is called the Cradle of the North Wind, some persons on the island having the power to raise a storm by muttering an incantation over it—rather a dangerous faculty on that rocky coast. A curious little room, evidently used as a porter's lodge, overlooks the west doorway. This has been the principal entrance to the church, and is of late design, with three orders of shallow mouldings carried round jamb and arch. The base stops in a curious manner without any return, and is again completely stopped on the south side of the nave, where it joins the earlier west wall of the south transept. The nave walls are broken down, and only the lower portions of two windows in the south wall remain. The view from the south side is one of the best; all the work seen on this side is Decorated. The south aisle is spanned by two curious arches or flying buttresses, which have been built afterwards as an additional security to the piers. They come in very awkwardly with the clerestory windows, which are very small. The caps of the south aisle piers are the most interesting details in the building. They are covered with figure subjects, some of which have a strong Romanesque feeling; others are crude, but full of life and vigour. The subjects are the usual ones, Adam and Eve, an angel weighing souls, the Crucifixion, &c. There is a strong Renaissance feeling in this part of the church, which shows its late date. It is impossible, however, to fix any definite period, as we have no record of the building. Iona Abbey, being shut off more or less from the rest of Scotland, and being under native Celtic influence on the one hand and foreign Renaissance influence on the other, naturally differs



NORTH ELEVATION, STIRLING PALACE.

considerably from other buildings. There has been a side altar in the south aisle lighted by an eastern window, with a piscina opposite. This window has fully more stone than daylight in its tracery, but when worked out shows a peculiar and rather pleasing design, the wheel of the tracery being carried down into the body of the window. The south window of the presbytery is identical with the south transept window. The tracery is heavy and the mouldings shallow and late. The east window is of two periods, the jambs belonging to an earlier window, while the tracery has been filled in afterwards. The north window of the presbytery is the best design of the three. There are two consecration crosses on the east gable, two of five in the building. These are sinkings in the stone in the shape of a Greek cross with rounded ends, and were cut at the dedication of the church. The sacristy opens off the choir on the north, and contains two side windows, the upper one having the triangular pre-Norman head, but ornamented with the dog-tooth inside. This part is Transitional. Continuing our way round the building, we pass the outside of the chapter-house, and come to a small chapel, lying at a different orientation from the church. There is nothing remaining now but four walls and a fragment of the doorway. Passing the dormitories, of which very little remains, we come to the lavatory, through which the monks ingeniously turned the mill stream which flows hard by, and so had a well-flushed drain. All these buildings are much broken down so that it is only by comparison with other conventual establishments that the use of these various offices can be ascertained. The foundations of another building lie to the east: it may have been another dormitory or a hospital. Coming to the north side of the cloisters we have the exterior of the refectory with its straight buttresses and early pointed windows, the only one of the outbuildings with any pretence to design. The lower part has been used as a cellar, and the upper windows have lighted the dining-hall, which has been entered by a stair to the east.

We enter the cloister garth by what has been a fine Early English doorway belonging to the refectory, and used before the present cloister garth and the rooms to the east were built. This corner of the cloister has also had a small lodge over the entrance, as at the south corner. The cloister itself has been rather elaborate, covered with a lean-to roof resting on the main walls and supported by an arcade round the garth. This arcade is quite gone, but one or two bases and caps remain which show that it has rested on twin shafts and has been considerably ornamented with Celtic carving. The south-west corner arch still remains, and shows the valley gutter above.

Taking a general view of the cloisters, it will be seen that the chapter-house lies to the east, separated from the north transept by the slype or passage. Over the chapter-house was the library, which contained a large and valuable collection of books.

The chapter-house arcade is a curious example of Transition work, the arches retaining the Romanesque form, but being filled with dog-tooth ornament.

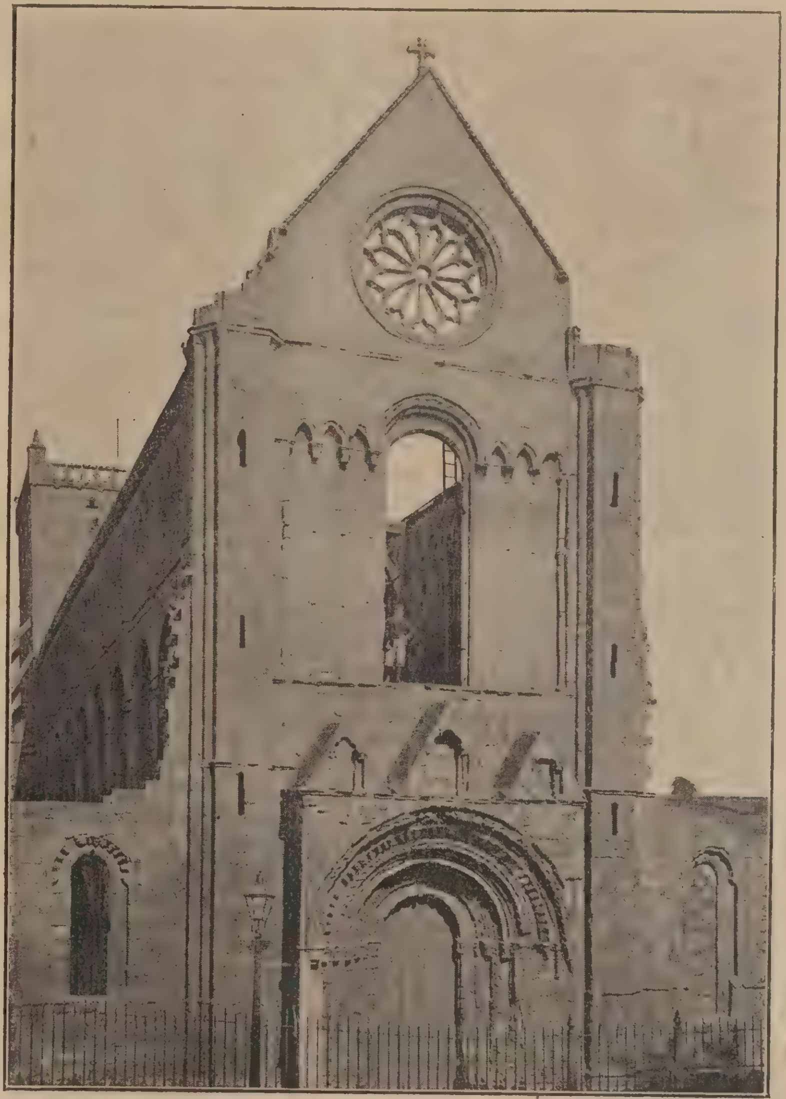
We enter the north transept by a door in the corner of the cloister. This is the oldest part of the building. The recesses and niche in the east wall, and the arch under the tower adjoining, all have caps and mouldings of late Norman style. There has been an altar between the two recesses, and a small window in the opposite wall has lit up a figure of the Virgin. The tower is supported by four arches over the crossing, and has been divided into four storeys. The belfry floor is pierced with large square traceried windows on three sides and on the north with a simple two-light window set in a square panel. It has been covered, according to old prints, with an ordinary saddle-back roof rising inside the parapet. The caps in the crossing are interesting, being carved with foliage and figures better executed than those in the south aisle. On the abacus of the cap of the south-east pier is an inscription:

DONALDVS O'BROLCHAN FECIT HOC
OPVS.

There was a Donaldus O'Bralchan who came from Ireland about 1203, but as the pier and cap moulds belong to the fourteenth century this affords little clue to the date.

The arcade opening to the south aisle has a sturdy and solid feeling which is helped by the somewhat short and thick cylindrical columns. On the south side of the presbytery is the sedilia, seated for the three officiating ministers, and close by, the piscina, much mutilated by tourists, but still bearing traces of a beautiful design. The Celtic carving in the spandrels of the sedilia is, or has been, good, but otherwise the design is inferior. In front of this lies the effigy of Abbot McKenzie, much worn away, and on the opposite side that of Abbot McKinnon, in better preservation, with a good inscription round his slab. On the north side of the choir is the doorway to the sacristy, one of the best pieces of design in the building. It is a late addition, however, as seen from the earlier character of the arcade above, which has formerly opened into a raised side-chapel. This has probably had a communication, by a passage in the thickness of the east wall of the north transept, with the library and so to the parlour and other buildings on the north, so that the monks could watch the ceremony without entering the choir. This arcade is of exactly the same character as that in the chapter-house, except that this is pointed, while the latter is round.

We have now in a general way gone over the building. Our travels were now near an end, and having purchased the inevitable green stones and white heather we sailed in the beginning of September for Oban, and escaping with difficulty from the attentions of fifty hotel porters, got to our train and arrived safely in Edinburgh once more.



JEDBURGH ABBEY: WEST FRONT.

Views and Reviews.

Planning.*

"Memorabilia" rather than "Principia" suggests itself to the reviewer as the true term to characterise the scope of this readable little volume dealing with a subject of vital importance to the architect. Mr. Marks shows himself to have been a diligent note-taker, a faithful keeper of the architect's commonplace book, while he has sufficient power in arrangement and lucidity in writing to be able to throw his multifarious facts into a coherent whole.

It has been naturally impossible for the writer of this work to be equally expert in every class of the buildings he classifies, and while he is evidently at home in some of his subjects, there are others in which the treatment is somewhat cursory, and others again where matters of importance have been passed over or even altogether omitted. This, however, is only a first edition, and considerable revision and extension may be expected when the author's labours have found a fitting recognition.

The eighty plans are far too few to adequately illustrate such a subject, and they have been selected in a somewhat uncertain manner; in some cases they are not sufficiently up-to-date, and in others very much better examples might have been given. In addition to any defects in the illustration from actual work, however, there is also a lack of illustrative

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* "The Principles of Planning." By Percy L. Marks, B. T. Batsford, 94 High Holborn, W.C. Price 6s. nett.

STIRLING TOWN HALL.

diagrams which would save much of the letterpress of the book. For an architect, the author is curiously given to work out his calculations in written rather than in geometrical figures. For instance, in dealing with a suggested minimum size for a bedroom, he arrives, by a curious process of calculation, at 9ft. × 8ft., but had he drawn the proposed room, with the furniture in place, he would surely have discovered that 10ft. × 7ft. would give him a better result. It might have been noted in this connection that 12ft. × 8ft. is a standard hotel bedroom dimension.

We gave the scope of the book as "memorabilia" rather than "principia" because of the general laws of planning the author has little to tell us. His treatment of design in relation to plan best exemplifies this. "The word 'design,'" he informs us in a footnote, "throughout this book is used to signify the treatment of the elevations." Of beauty in planning, of the interest and suggestiveness of a good plan, apart from the convenience of its arrangement and the fulfilment of all the utilitarian requirements of the case, he would appear to have little or no conception; while stranger still is the omission of any hint of the importance of the element of evolution in plan, of the gradual growth of type, and of the importance to the student of the recognition and study of these factors in historic planning, as affording to them a clue to the tendencies of the work of their own time.

It is the failure to grasp this side of the question that probably accounts for the author supposing that for church planning one example, and that a mere revival church like St. Mary Abbots, Kensington, would be sufficient illustration. The requirements of modern church planning have been very inefficiently understood, as may be gathered when it is pointed out that there is no mention of the supreme importance, in town churches, of communicants being able to pass through, and to return from, the chancel to their seats with the decency and order requisite to the service.

In a similar way club planning hardly began and ended with the Constitutional Club in Northumberland Avenue, while the essential difference between a modern club of that type, with its hotel-like characteristics, and the domestic-palatial order of the older clubs (such as, for instance, the Reform Club) is nowhere alluded to.

The value, therefore, of Mr. Marks' work appears to us to be that it brings together in a handy work a collection of those facts and figures which are the indispensable basis of a plan. It is strange how difficult it would be to say off-hand where to find, for example, the number of cubic feet required to house a ton of coal, or where to lay your hand on the exact data of the spacing of a school dining-room, or where to hit upon a complete list of the requirements of, say, an abattoir. Such facts have doubtless been given many times before, but in their scattered state they are comparatively useless. It takes too long to hunt them up, when the need arises, in many books. Further, if the possession of this work brings home to the student and to the young architect the value of such memoranda and leads them to use their eyes, rule, and notebook to greater advantage, it is clear that the author's aim will have been accomplished.

The work is divided into ten chapters, with two appendices. These latter are extracts from the L.C.C. by-laws as to theatres and from the Education Code for school buildings, both of which would be better given in full, as extracts in such matters are of doubtful assistance, if not actually dangerous.

Chapters I. and II. of "Introductory Remarks" and the "Enunciation of Broad Principles" may be passed over to arrive at Chapter III., "Essential Features, Accommodation, &c.," which is the core of the book. It is an alphabetically-grouped list of buildings from abattoir to workhouse, giving under each head (*a*) essential features, and (*b*) requisite accommodation in each case, followed by a few explanatory notes.

Some of the classes are well treated, evidently those with which the author has had some personal acquaintance. Synagogues, for instance, are well explained, though a plan of one might well have been given. Take, however, as an instance of the author's method, *Art Galleries*: "(*a*) ample accommodation for works of art and for the public, top light in galleries, symmetrical treatment (under the best conditions), good staircases; (*b*) galleries for various classified works of art, packing and delivery rooms, and clerical offices, cloak and umbrella stores, lavatory, &c., refreshment room, picture hoist, stores, caretaker's rooms, &c."

The above, with a plan of the Royal Academy galleries, can hardly be described as adequate. For instance, under (*a*) nothing is said as to the circulation of the public, *i.e.*, the arrangement of the galleries so that no room can be traversed twice, or made into a cul-de-sac. Nor in regard to lighting is there any reference to the value of side-lit rooms for cabinet works, nor any note as to the importance of avoiding features such as domes and towers that would cast shadows over the skylights. Again, the proper width for a gallery is a point of the greatest importance on which the author is silent, while there is no diagram of a scientific gallery section that will avoid reflections on the pictures.

Under (*b*), again, a student might miss the curator's room (used also for committees), which is apparently comprised in the term "clerical offices."

A curious omission in the book is that of restaurants, the data for which might most usefully be given. In all cases there ought to be a reference to sources of detailed information, and a short list of good typical buildings.

Expanded on these lines in a second edition the book would be of great value to students and a handy *aide-mémoire* to architects.

The remaining chapters of the book may be briefly indicated. Chapter IV. deals with "Aspect." The buildings are here also alphabetically listed, but in too brief a form. Schools, for instance, are left out, whereas the fact that the London School Board prefer east and west for their normal type of plan might well have been stated.

Chapter V. deals with "Privacy and Seclusion," door-hanging and the position of the W.C. in house-planning being dealt with in detail.

In Chapter VI., under "Roominess, Furniture Requirement, and Prospect," circularity in preference to angularity of furniture is advocated for small rooms.

Chapter VII. is concerned with "Grouping," the service from kitchen to dining-room, and the passage from the drawing-room, and that between bedrooms and bath-rooms, are all referred to.

"Staircases and Miscellaneous Features" fill up Chapter VIII., with remarks on cupboards, inglenooks, porches (but with the omission of porte-cochères) and fittings. In Chapter IX., "Economy," there is a good diagram of the old Board School staircase, two in one cage, the use of two colours making the construction quite plain. The last chapter, No. 10, "Design in Relation to Plan," contains little more than some comments on symmetrical disposition and on the abuses that arise from a false use of the same.

The odd humour of the author relieves the monotony of the subject with an occasional riddle; how, for instance, he extricated his lady client from an extra special bijou staircase that she had rashly ascended, the use of the hatchet being expressly barred, is left as the judicious mystery of page 83. X. Y. Z.

Improvements at Yarmouth.—A Local Government Board enquiry was held recently into an application for a loan of £7,500 for improvements at Gorleston. It is intended to continue the existing cliff improvement by the addition of a strip of cliff 2,394ft. long, the top of which would be laid out with grass, for use as a public promenade, while at the foot a concrete retaining wall would be built, which would contribute to shore protection.

SURREY ARCHÆOLOGICAL SOCIETY.

The Plan of a Cistercian Abbey.

THE annual report of the council of the above society states that though the increase in membership during the past two or three years has been considerable the council is persuaded that the number does not yet adequately represent those who are interested in the archæology of the county. Much interest naturally attaches to the excavations at the ancient Cistercian abbey at Waverley, near Farnham. The council states that these were continued last summer under the superintendence of the Rev. T. S. Cooper and Mr. Henry Horncastle, with even more important and satisfactory results than hitherto. The work has been at times very perplexing, owing to the many and unexpected walls and footings found of the Norman abbey, mixed up with, and sometimes made use of in, the later buildings. In the previous year Mr. Brakspear discovered the little presbytery of the Norman church in, and forming part of, the south transept of the later magnificent church planned by William de Bradewater. The long narrow Norman nave has now been traced below the cloister. The original cloister was at some time considerably enlarged and carried across the cellarium as well as the nave of the first church. The arrangement of the frater and its pulpit is interesting, as it shows the former to be of two dates at least. The plan of the infirmary hall and kitchen is now clear, and it has become evident that there was no building between this portion of the Abbey and the river. Some interesting features, too, have come to light in the direction of the monks' dormitory. Much of the Norman work here remains, with the south wall on a line with that of the frater; later the dormitory was extended southwards at a higher level almost to the river bank. At the north end the doorway leading from the cloister and the fine broad steps ascending to the dormitory have been exposed, and, close by, a winding staircase which probably formed the approach to the treasury. The plan of Bradewater's church also is now nearly complete. There is still a good deal to be done west of the cellarium, where the guest houses, the infirmary of the conversi, and possibly a gateway may be looked for. This is of almost greater importance than the work already done, since these buildings of the outer court have never been worked out properly anywhere; both at Fountains and Furness the remains of them are anything but complete, and at the former it is known there were a number of buildings of which no trace can be found. The Society has therefore the opportunity of adding materially to what is already known of the plan of a Cistercian abbey, an opportunity which may not present itself again.

THE ACOUSTICS OF CHURCHES AND PUBLIC BUILDINGS.

By Charles E. Savery.

THE word "acoustics" raises the most disquieting thoughts in the minds of architects, who have before them a long array of admitted failures in this important matter. Many buildings erected from the plans of some of our ablest men are defective, such as St. Paul's Cathedral and several of the churches built by the leading architects connected with the Gothic Revival.

It seems that the acoustic properties of a building can only be judged after its completion, and that no rule therefore exists by which any certainty of result can be depended on. Our attention may be best directed to an attempt to remedy, or at least improve, the acoustic properties of building where the defect complained of exists. We are very apt to attach blame to construction when the fault really lies in the arrangement of the rostrum or pulpit, in the case of a preacher or speaker, or in the position of the organ or choir stalls in regard to musical sounds.

At the outset the very arrangement which tradition has almost made sacred presents an obstacle to good acoustic results. Take the case of a church. We have first the aisle, then probably two side aisles with various openings extending to a chancel, with possibly a chapel attached. Add to this two or more transepts and you at once have a building with half-a-dozen different outlets for a preacher to adequately fill.

He is expected also to make his voice reach each part of the building from a spot neither in the middle nor at the end of the building, the favourite position being at an angle of one of the transepts, where the voice waves are broken up into minute particles, growing naturally feebler the more that they are diversified. Of course when great height is sought, as in St. Paul's Cathedral, a considerable echo is the result; and this in a modified degree is not altogether objectionable, especially in the case of musical sounds, the rolling notes of the organ alternately rising and falling with imposing effect. But the same cause operates *against* the preacher's voice being perfectly heard. So far, therefore, as preaching is concerned, the position of the speaker is of great importance. Our forefathers showed that they recognised this when they placed the pulpit in the middle of the aisle and they further exhibited their common-sense by placing a sounding-board at the back of the pulpit. The strain to which the voice is subjected whilst preaching for, say, only half-an-hour can be appreciated only by those who have experienced it, and they alone know the aid which these old-fashioned boards afford. The principle of such help is at once apparent in the construction of many of our musical instruments.

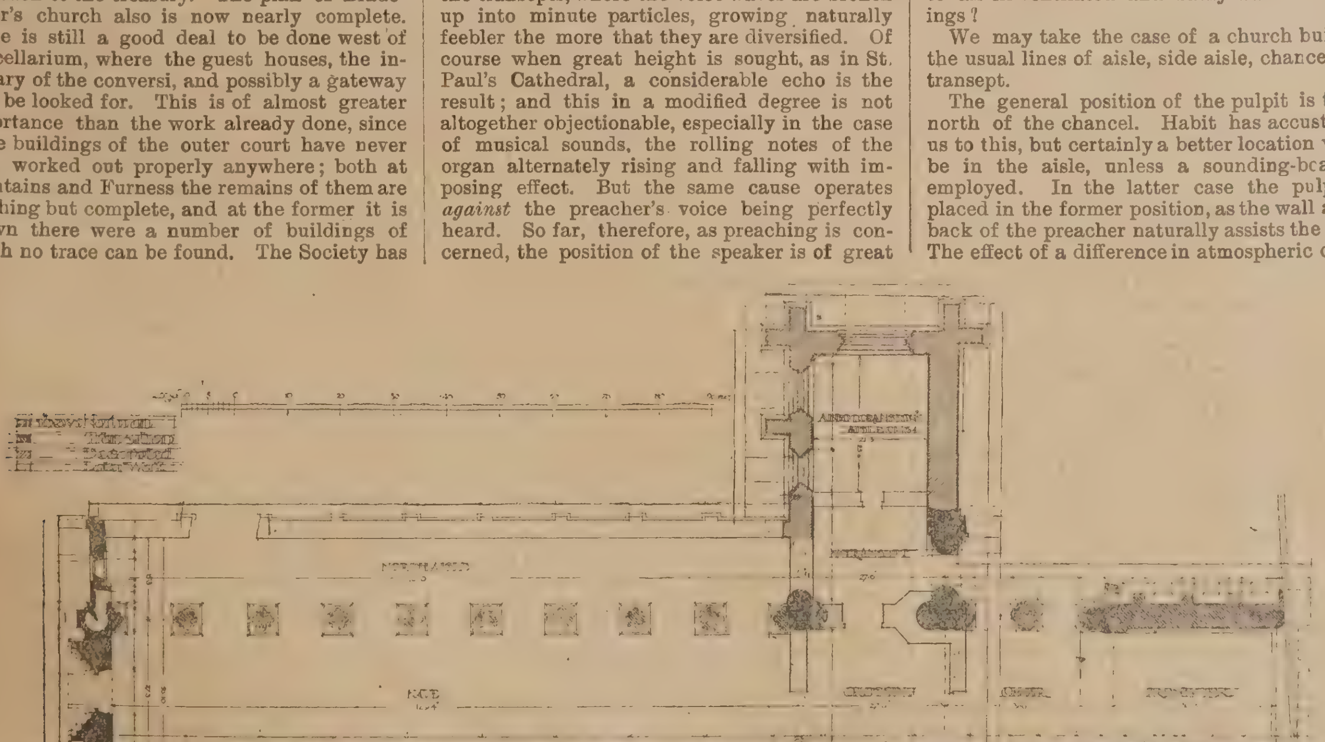
Where the traditional planning of ecclesiastical buildings is not followed, it certainly allows the architect a greater scope for studying the natural laws of acoustics, instead of having to adapt them to a particular type of building. I say "adapt" them, yet in the majority of instances there is so much uncertainty in the result that it is quite a matter of speculation as to whether after the fabric is finished it will possess entirely satisfactory properties.

Some buildings with which great care in planning has been taken with a view to good acoustics have an unpleasant vibration, rendering a preacher inaudable at a short distance away. In such a case wires stretched across the building have proved very helpful. These assist the natural vibrations of the voice, as opposed to those caused by mere echo. Persons accustomed to either sing or speak in public, more especially the former, know by experience when their voice fills the auditorium. There is nothing more trying than to find a difficulty in doing this. The voice seems as if it had no resonance, and great exhaustion is very frequently the result of prolonged efforts under such conditions. It therefore becomes necessary to break up the opposing echoes before satisfactory results can be obtained, and at the same time to arrange that there shall be no confusion of sounds which it is desired should be actually heard.

The atmosphere in a large building also considerably affects the waves of sound. On a damp foggy day noises close at hand often sound indistinct; and may not the same apply to all ill-ventilated and badly-warmed buildings?

We may take the case of a church built on the usual lines of aisle, side aisle, chancel and transept.

The general position of the pulpit is to the north of the chancel. Habit has accustomed us to this, but certainly a better location would be in the aisle, unless a sounding-board is employed. In the latter case the pulpit is placed in the former position, as the wall at the back of the preacher naturally assists the voe.ic The effect of a difference in atmospheric condi-



PLAN OF JEDBURGH ABBEY

tions would probably be felt more in a very large building capable of seating, say, a couple of thousand persons than in a smaller edifice, for the simple reason that where a quantity of heavy atmosphere accumulates it increases the difficulty of sound penetrating it. For example, in a small building on a foggy day the inside warmth will generally tend to disperse the fog, but in a very large building the atmosphere will frequently remain in a clouded state, despite all efforts to remove it.

Wires will frequently obviate echo: they need not be unsightly or placed too low. With regard to vocal and instrumental sounds in churches, the choir is generally placed, in accordance with custom, in that part of the building bearing this name, and, as a rule, the choir stalls face each other. Now it is obvious that in a very small chancel the voices cannot be heard to the best advantage from the body of the church. Here, again, tradition has made this arrangement almost a part of the economy of seating. Where, then, should the choir be placed? Some authorities have advocated a position in a raised gallery, and in many of our old churches prior to the Gothic Revival the favourite position for choir and organ was in the western gallery. Singing galleries were undoubtedly in common use in the middle centuries, both in England and on the Continent.

It must be borne in mind that where all is subservient to the exigencies of the particular form of church worship for which a building is designed the question of sound must be a secondary consideration. It is rather, therefore, to the solution of such obstacles as present themselves in connection with these arrangements that we should direct our attention. We have already spoken of the different aids to speaking which may be usefully employed, and in a modified degree the same applies to vocal music: identical difficulties have to be encountered and similar remedies applied to counteract them. The position of the singers themselves is a question not, perhaps, sufficiently appreciated. It stands, however, to reason that anyone with his head inclined towards a low desk or stall cannot properly direct his voice so that it shall be heard distinctly: the sound is thrown down and depressed instead of being transmitted towards the congregation.

Opinions differ widely as to the best position for the organ. The customary place assigned is near the choir. In the end of the eighteenth and till the middle of the last century the organ was located in the west gallery, and on purely acoustic grounds this is frequently the best position: the objection is that the choir is then too far from the organ. But a means of removing any such difficulty may be found in employing a console connected by electricity with the instrument. This, however, with an old instrument would mean possibly a remodelling of the original organ, and probably at considerable cost. We have therefore to consider how best to deal with the existing arrangement and at as little expense as possible.

Let us say that an organ chamber, so called, is *not* the best place for an organ. Who would think of putting a piano in a cupboard and expect to get satisfactory results from it? It is just as unreasonable to place the more powerful instrument in an organ chamber, *i.e.*, in its general form. The very elementary principle of sound affecting the construction of organ pipes is apparently entirely lost sight of here, for, independently of the impossibility of such being clearly heard, the pipes themselves require a certain amount of space to allow them to speak freely. Take, for the sake of example, the large 32ft. organ pipes. These are frequently built up *close to the roof*; and as a result we have a heavy booming noise like rolling thunder, instead of distinctness of voicing; we have chaos of sound, alike trying to choir and congregation. There is also a considerable waste of force in placing an instrument in such a situation. A far less powerful organ properly placed would sound better if given the chance of being adequately heard. Organ pipes should be at an adequate distance from the surrounding walls or roofs so as to be properly heard.

Another important point concerns the proper elevation of the instrument from the ground. This would depend of course upon the construction of the building. But provided that sufficient space is given above the instrument, this elevated position would undoubtedly improve its sound. In some of our cathedrals the organ has been placed above the screen dividing the choir from the body of the church. Such a position, I venture to think, is entirely wrong. It quite destroys the perspective of the interior, apart from other considerations. In many cathedrals two organs are frequently now used, both worked from one console. The effect is of course very beautiful, but we are now concerned with acoustics. Another position the organ should *not* occupy, though frequently assigned to it, is that immediately over the heating chamber. Here the wooden pipes become dry and brittle, giving imperfect tone, besides adding to the risks incurred through any outbreak of fire.

The foregoing suggestions on such an important subject are merely superficial. The details will be easily supplied by those readers conversant with the difficulties which the matter presents. But though these cannot be wholly removed, existing arrangements could frequently be improved so as to add alike to the comfort of preacher, singer musician, and, most important of all, the congregation itself.

PLYMOUTH WATER-SUPPLY.

THE BURRATOR WORKS.

AT the meeting held on April 2nd of the Institution of Civil Engineers a paper on "The Burrator Works for the Water-Supply of Plymouth" was read by Edward Sandeman, M.Inst.C.E.

The waterworks of Plymouth dated from 1590, in which year Sir Francis Drake, under powers conferred by an Act of Parliament of 1585, had commenced to build a weir on the River Mewe or Meavy, and to excavate an open watercourse or leat from the weir to Plymouth, a distance of 10½ miles in a direct line, but 18¾ miles along the route taken. The drainage area above the weir was 4,885 acres.

The work had been completed, and water had been brought into the town in April, 1591. Water taken from the river by this means had supplied the town for 300 years. The open watercourse, however, was liable to be blocked in times of snow and frost, and for this reason, and also because the increased population demanded a larger and more certain supply, various schemes had been promulgated for the storage of flood waters and the protection of the leat. In 1891 Mr. Sandeman had been appointed water engineer, and a few months later he presented a report, which had been adopted, advocating the building of a storage reservoir and the substitution of a line of pipes for the open leat. An Act of Parliament had been obtained in 1893 for the construction of the necessary works, which had been commenced in August of that year, Mr. James Mansergh, President Inst.C E., acting as consulting engineer.

By the new scheme the drainage area had been increased from 4,885 acres to 5,360 acres. Nearly the whole watershed lay on the granite formation, a small portion on the west side being on the Upper Devonian. The rainfall was about 58in. or 60in. annually, and an interesting feature of this gathering-ground was the unusually high dry-weather flow from it.

The Burrator reservoir was formed by two dams, one of masonry across the narrow gorge through which the river Meavy flowed, the other of earthwork lying between two hills, Sheepstor and Burrator. The greatest depth of water was 77ft., and the area covered by water was 117 acres, the quantity of water impounded being 657,000,000 gallons.

The masonry dam (called the Burrator dam) was built of large rough blocks of granite in cement in the interior, and faced with irregularly coursed granite on both sides. From bottom of foundation to coping of parapet wall, the height was 145ft. 6in. A roadway, 18ft. wide, was carried over this dam on five segmental arches of 25ft. span.

The earthen dam was remarkable for the fact that its construction had involved the cutting of a very deep trench for the foundations, although the dam had to withstand but a small head of water. The trench had been cut through decomposed granite to a depth of 105ft. in the centre, although the depth of water against the dam was only 17ft. This trench was interesting on account of the peculiar geological features met with. The water-tight core of the dam was of concrete (5ft. thick) up to within a few feet of ground-level, and of clay from that point upwards.

Water was drawn from the reservoir through two pipes of 36in. and 25in. diameter respectively, laid in a 10ft. culvert built in the masonry dam. There was no valve-tower. There was a specially designed valve to close the mouth of each outlet pipe, worked by gun-metal rods and chains from a chamber at the top of the dam, in addition to sluice valves in duplicate in a valve chamber on the lower side of the dam. The water drawn for consumption was passed through screen-chambers before entering the pipe leading to the service reservoirs. The flood water running to waste was measured over a weir 50ft. wide, the height of the water over the weir being recorded on a drum turned by clockwork. The compensation water was measured by an orifice gauge placed immediately below the weir. The water supplied to the town was measured over a gauge-weir 12ft. wide, after which it passed through a 25in. Venturi meter, which automatically recorded the flow on a diagram.

The pipe-line, which had been laid in lieu of the old leat, was 4½ miles long. The pipes were of 25in. diameter, and were capable of delivering between 8,000,000 and 11,000,000 gallons per day. The pipe-line had been completed in May, 1894, and the reservoir and other works in June, 1899, at a total cost of £178,000.

STONEHENGE.

RECOMMENDATIONS FOR ITS PRESERVATION.

THE recent fall of stones at Stonehenge having led to much public discussion, Sir Edmund Antrobus, of Amesbury Abbey, Wilts, invited the Society of Antiquaries, the Wilts Archæological Society, and the Society for the Protection of Ancient Buildings to advise him with regard to the better preservation of the famous monument.

A committee representing these three bodies met on March 26th, under the presidency of Viscount Dillon, the president of the Society of Antiquaries, at which meeting the following resolutions were passed:—

1. That this committee approves of the suggested protection of Stonehenge by a wire fence not less than 4ft. high following by two sides the existing roads and crossing on the west from the 331ft. level on the north road to the 332ft. level on the south road shown on the O.S. map (1-2,500), Wilts, sheet liv., 14.

2. That the committee recommends, without prejudice to any legal question, that the local authorities be requested to agree to divert the existing trackway or ridgeway from Netheravon now passing through the earth circle so as to pass from the 302-ft. level to the 331-ft. and 332-ft. levels in the O.S. map immediately west of Stonehenge.

3. That stones 6 and 7, with their lintel, and stone 56 (according to the numbering of Mr. Petrie's plan), be first examined with a view to maintaining them in a position of safety.

4. That, in the opinion of this committee, stone 22 should be replaced, stone 21 be made safe, and the lintel of 21 and 22 be replaced in the most safe and conservative manner. The committee also recommends the re-erection of stones 57 and 58, and their lintel 158.

5. That the instructions to custodians already in force be approved with a few suggested alterations.

6. That this committee feels that it is impossible to overstate the value of the assistance which the County Council, the District Council, and the Parish Council of Amesbury can give to the efforts made to preserve this unique monument.

7. That these resolutions be sent to Sir Edmund Antrobus with the earnest thanks of the committee for the part he is proposing to take in the preservation of Stonehenge.

DUNOON GRAMMAR SCHOOL.

IN November 1898 instructions were issued for competitive plans for additions to the Grammar School, and at a meeting of the board in January 1899, Mr. Fraser's plan was adopted. Operations were commenced in the month of July 1899. The central portion was commenced first, and when completed the north wing was started, the whole being ready for occupation by the end of 1900. The school, before alterations, consisted of a one-storey building, with the Secondary Department in two storeys, and contained 10 class-rooms. As now completed it contains class-rooms, with art-room, lecture-room, chemical laboratory, physical laboratory, cookery-room, music-room, with separate private rooms for the rector and lady teachers, separate cloak-rooms for the boys and girls and infant boys and girls, with separate staircases and entrances for each. Accommodation is now provided for 820 scholars, exclusive of the science and art rooms. The main entrance is in the centre of the building, with separate entrances for the boys, girls, and infants. The central entrance leads into the entrance hall, in which are the boys' and girls' staircases. The floor of the hall is laid with granolithic and mosaic, and the walls have a tiled dado 4ft. high. From the hall, corridors lead off on either hand on both floors, giving access to all rooms in the building. These corridors have also a tiled dado and granolithic floors. Immediately adjoining the entrances are the cloak-rooms, which have two doors, the students entering the school through them. The class-rooms are fitted up with a staging and dual desks of the latest pattern. The cookery-room is fitted up with a cooking-stove, sink, and cooking tables. The chemical laboratory is fitted up with chemical tables for 18 students, and the physical laboratory is fitted with tables for 18 students and a dark room, &c. The art room is arranged with staging on the semi-circular plan, and supplied with a complete set of models and casts, the windows having dark blinds, so that the light can be regulated as required. The whole building is heated by hot-water pipes from a central heating-chamber, and ventilated with automatic ventilators and fresh-air inlets. The colouring of the walls has been arranged so as to give a variety of colour schemes. The exterior architecture of the building has been limited by the style of the past, and by the fact that the old material has been used to a considerable extent. The contractors were:—Mr. Jas. Tannock, builder Mr. James Drummond, joiner; Mr. Hugh Stewart, plumber; Mr. George Macpherson, slater; Mr. Andrew M'Farlane, plasterer and tile-worker; Mr. Thomas Sweet, painter; Messrs. James Boyd and Son, Paisley, heating engineers; Mr. Young, joiner for the laboratory fittings; the Bennett Furnishing Co., for the seats and furniture; and Mr. William Shepherd for the tar macadam. Mr. Thomas Young, jun., acted as clerk of works, Mr. John Baxter as measurer. Mr. William Fraser is the architect. The illustration on this page was kindly lent to us by the "Dunoon Herald."

INVERURIE ABATTOIR.

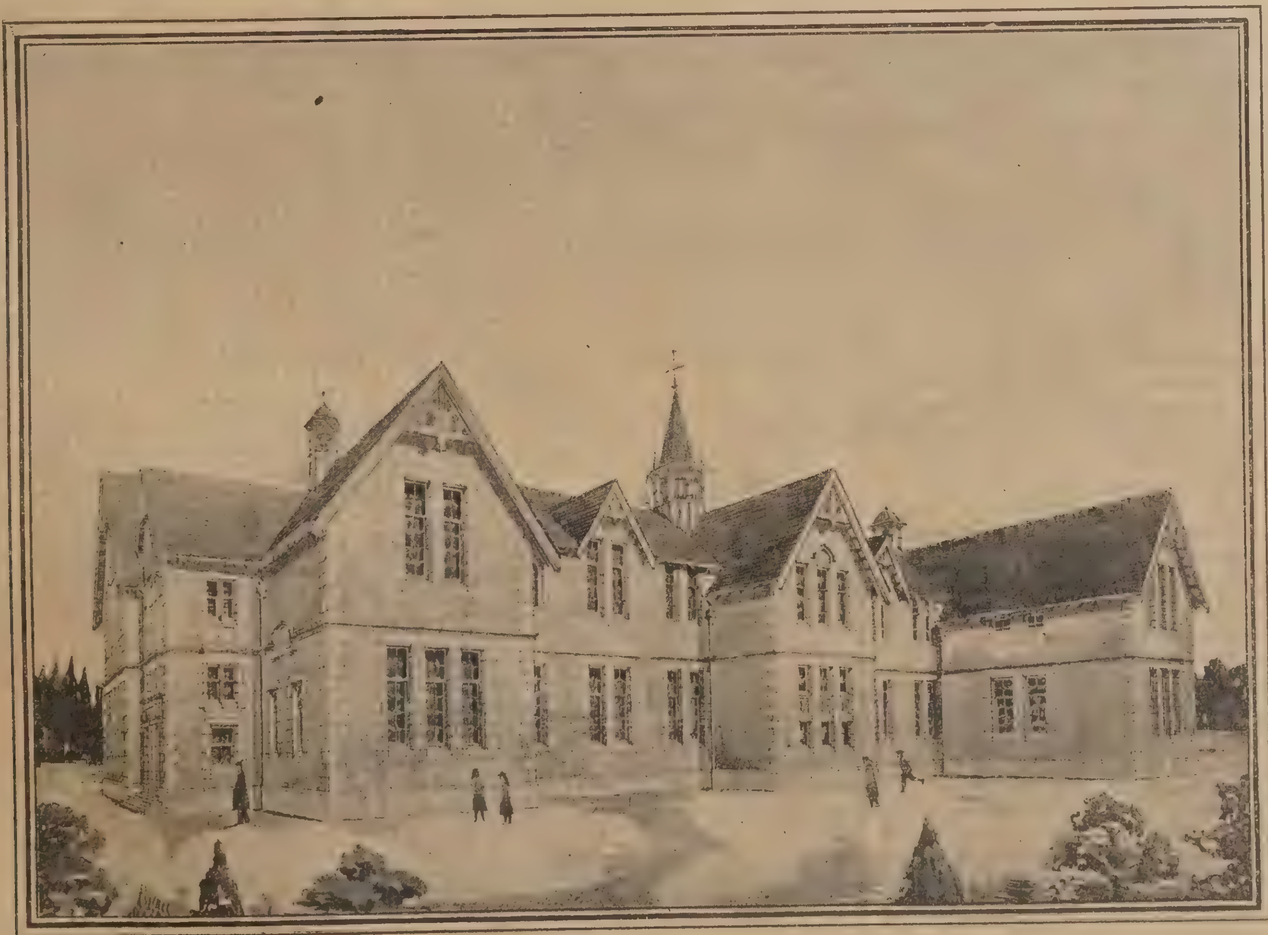
A MUNICIPAL slaughterhouse is being erected in North Street, near the market stance, and about 100 yards back from the line of the road. It consists of two buildings running parallel to each other. One of these is divided crosswise into six compartments, for killing and dressing purposes, by heavy iron railings. Large sliding doors provide for loading the meat on to lorries, and as each of the booths is entirely separated from the others a complete set of appliances has been erected in every compartment. Overhead rails have been fitted up for hanging the carcases, and there is a plentiful supply of fresh water. In order that everything can easily be kept clean and fresh, the floors are of cement and the walls have a covering of this material up to a height of about 6ft. The other building is divided off into byres, and communication is secured between these and the shambles by doorways in a mutual wall. Special provision is made for the killing of pigs, and in connection with this there is an installation of hot water. The slaughterhouse contains accommodation for six tenants, each of whom has a byre and a booth to himself. A roadway leading from the street divides into two and encircles the building, giving facility for handling the cattle and meat. The total estimated cost of the undertaking is between £2,200 and £2,300. The architect is Mr. George Gray, of Inverurie.

LEAD PIPES.

IN the course of a recent lecture before the Society of Engineers on "The Production of Metallic Bars and Tubes under Pressure," Mr. Percy F. Nursey, past-president, described the various processes and apparatus employed in the manufacture of bars and tubes by forcing metal through dies.

The primary application of this principle, he observed, was to the manufacture of lead pipes; but before describing the methods of their production he referred to some water-pipes made by the Romans which he inspected at Bath some years ago during some excavations in the Roman baths there. They measured about 18in. wide by 4in. deep, and were made from a dished strip of lead which constituted the top, whilst a flat strip, having its edges turned up over the edges of the upper strip, formed the bottom. The lead of which these pipes were made was stated to have been obtained from mines in the Mendip Hills, where lead pigs have been discovered bearing the stamps of the Roman Emperors Claudius, Vespasian and Hadrian respectively.

The author then referred to the early manufacture of lead pipes, which were made by either drawing or rolling cylinders of lead down to the required diameter on a mandrel which formed the bore. Lead pipes were also made by bending sheet-lead over a mandrel and soldering the edges. These unsatisfactory methods were in time superseded by the lead-pipe press, in which molten lead is placed in a heated container, and when cooled down to plasticity is forced through a die by hydraulic pressure. By this means, instead of only short lengths of pipe being made, as with the old methods, pipes of any required length are pro



DUNOON GRAMMAR SCHOOL. WILLIAM FRASER, ARCHITECT.

duced. The author described the process of manufacture as he had witnessed it at the Farringdon Works of Messrs. Pontifex, in Shoe Lane, London. He then described the improved lead-pipe press of Mr. Alexander Wylie, as made by Messrs. Wilson and Sons, of Johnstone, Glasgow, which is a considerable advance upon the ordinary lead-pipe press. In the later examples, instead of the container being kept hot by a fire or a ring of gas jets it is jacketed and steam-heated.

COMPUTING LAND AREAS.

By G. A. T. MIDDLETON, A.R.I.B.A.

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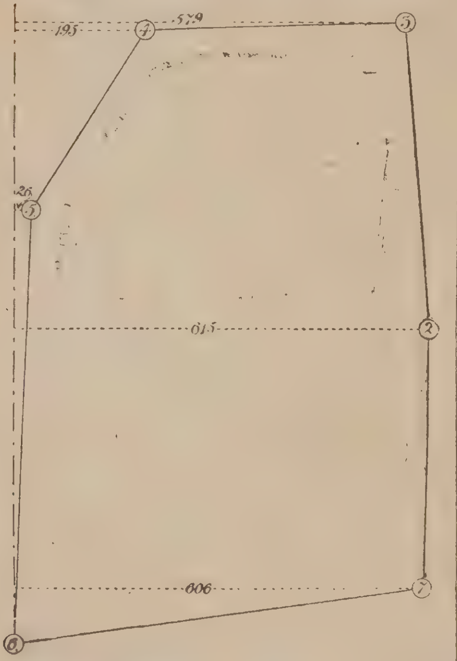
AFTER a piece of land has been surveyed and the survey accurately plotted, it is a matter of no great difficulty to ascertain its area. The uninitiated, however, may do well to note that a plan is a horizontal projection, and that consequently the area as calculated should be the *flat* area, and not the *slope* area, in the case of hilly ground; and is in fact the true area.



COMPUTING AREAS BY EASTERLY OFFSETS.

The most usual system of computation is to divide the land into a series of triangles, neglecting irregular boundaries for the moment; and it is neither necessary nor usually convenient that these triangles should be the same as those used in the field work, even when the land has been surveyed on a system of triangles. The area of each triangle is ascertained by multiplying its base by half its altitude, these areas are summed, and the thing is done, except for the correction necessary for irregular boundaries. Often, however, where accuracy is not required, the boundary lines of the various triangles are so laid down as to form rough "give and take" lines, so compensating for irregularities; and if the dimensions be in links the whole process is then one of extreme simplicity. But it lacks accuracy. The bases of the triangles and their altitudes have to be measured by scale, and a very small error in either may make a really serious error in area possible.

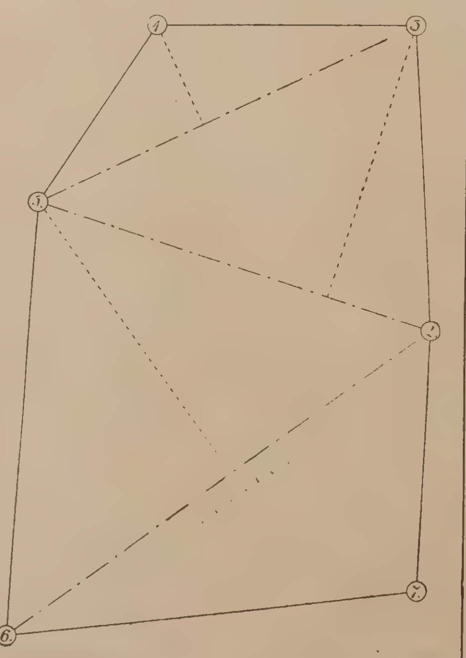
Another and much more accurate system of computation is that by means of easterly offsets from a meridian line drawn through the most westerly station of the survey; and where the survey has been by theodolite traverse round the boundary lines it may be considered to be absolutely accurate, as the easterly offsets can be accurately obtained from the Traverse Field Book, as can also the northerly and southerly distance travellings of the separate boundary lines. According to this system, the offsets of each pair of stations in succession from the datum meridian are summed, and multiplied by half the Northing or Southing. Areas made up by Northings are summed—so are those made up by Southings. The Southing areas are deducted from the Northing areas, and the result is the area of the land.

Thus in the plot chosen for illustration, the meridian passes through Station 6, which consequently has an offset of 0, while the offsets from the meridian of Stations 7, 2, 3, 4 and 5 are 606, 615, 579, 195, and 26 links respectively. Further than this, from 6 to 7, there is a Northing of 84 links, from 7 to 2 a Northing of 386 links, from 2 to 3 a Northing of 450 links, from 3 to 4 a Southing of 11 links, from 4 to 5 a Southing of 267 links, and from 5 to 6 a Southing of 642 links. Put into tabular from the whole works as follows:—

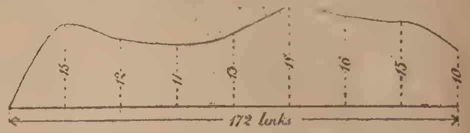
Station	Easterly offset	Sum of Easterly offsets	Half Latitude	Northing areas	Southing areas
6 7	0 606	606	42 N.	25,452	—
7 2	606 615	1,221	193 N.	235,653	—
2 3	615 579	1,194	225 N.	268,650	—
3 4	579 195	774	5·5 S.	—	4,257
4 5	195 26	221	133·5 S.	—	29,503
5 6	26 0	26	321 S.	—	8,346
			Totals Subtract	529,755 42,106	42,106
			Area	487,649	

This area is in square links, and as there are 100,000 square links in an acre, and it is a decimal measure, it is at once seen that the area is 4·87649 acres. Multiplication of the decimal 0·87649 by 4 reveals that this is 3 50596 roods, and multiplication of 0·50596 by 40 brings it to 20·2384 poles, the result, according to the usual notation, being 4 acres, 3 roods, 20¼ poles nearly.

This would probably have to be rectified by some small corrections for irregularities of outline as measured by offsets from the boundary lines. No method of computing curved outlines can be considered as absolutely correct, but that most usually adopted may be stated as follows:—The length of the base line (or boundary line) is divided into equal parts, any convenient number being taken (it being remembered that the greater the number the closer the approximation to accuracy) and offsets being measured at each of these points The offsets at the two extreme ends of the base are summed, and added to twice the sum of all the other offsets, the total thus obtained being multiplied by half the base line and divided by the number of divisions (not offsets) taken.



COMPUTING AREAS BY TRIANGULATION.



COMPUTING AREAS OF IRREGULAR OUTLINE.

Thus in the example taken for illustration, the offsets at the extremes are 0 and 10, and the intermediates are 15, 12, 11, 13, 18, 16, and 15, while the length of the base line is 172 links, and the number of divisions is 8. The area, then, is

$$\left\{0+10+2(15+12+11+13+18+16)\right\}\times\frac{172}{2}\div 8$$
$$=(10+170)\times 86\div 8$$
$$=180\times 86+8$$
$$=\frac{15480}{8}$$
$$=1935 \text{ square links.}$$

NORMAN CHURCHES IN THE EAST RIDING WOLDS.

AT a recent meeting of the East Riding Antiquarian Society the chairman (the Rev. E. Maule Cole, F.G.S.) read a paper on "Norman Work in Old Churches." He said that in the chalk wolds of the East Riding was a greater wealth of old Norman churches than was perhaps to be found anywhere else in a limited area. The fonts, as a rule, were remarkably well preserved, and some of them dated back even to Saxon times. That at Cottam represented the martyrdom of St. Lawrence. The old font at Cowlam was a beautiful specimen, and was said to be Saxon. Great Driffield church was commonly said to have a Norman arcade, but that was, strictly speaking, not correct. It was Transitional. At Little Driffield the only Norman remains consisted of an early plain tower arch with a square abacus. At Fridaythorpe the church had almost fallen into decay and was about to be restored. There was a fine Norman chancel arch, and the south doorway showed somewhat late Norman chevron work in the arch.

Proceeding with the thirteen churches in his list, the lecturer said that the present Norman church at Garton was probably preceded by a Saxon one. The tower was extremely massive, and as wide as the nave. There was a Norman doorway in the church at Grimston in which one descended by several steps, as is often the case on the Wolds. The churches seemed to have been intentionally built below the level of the surface. The chancel was plain early Norman work. The chief glory of the church was its font, which was very massive, being of 38in. diameter, and the largest on the Wolds with the exception of that at Kirkburn, which was of exactly the same size.

The tower at Grindalythe was of the eleventh century. Kilham had a fine, rather late Norman south doorway. He was now of opinion that the church at Kirkburn was not built before 1150. At Reighton there was a beautiful square Norman font. There was very early work in the church at Weaverthorpe; it contained early Saxon work. Dealing with Wetwang, he said that there was doubtless a Saxon church there, but there were no remains, as that church was doubtless constructed of wood. The present church was now undergoing restoration and many interesting features were being disclosed. The tower at Wharram-le-Street was very ancient, and there were reasons for supposing it to be of pre-Conquest date, but he would leave that for others to decide. In his opinion, the churches he had mentioned, so far as their existing remains afford a criterion, were built in the following order:—Last quarter of the eleventh century—Wharram-le-Street and Kirby-Grindalythe. Twelfth century (first quarter)—Weaverthorpe, Wold Newton, Little Driffield, Grimston, and Fridaythorpe; second quarter, Wetwang, Kilham, Garton, and Kirkburn; last quarter, Great Driffield.

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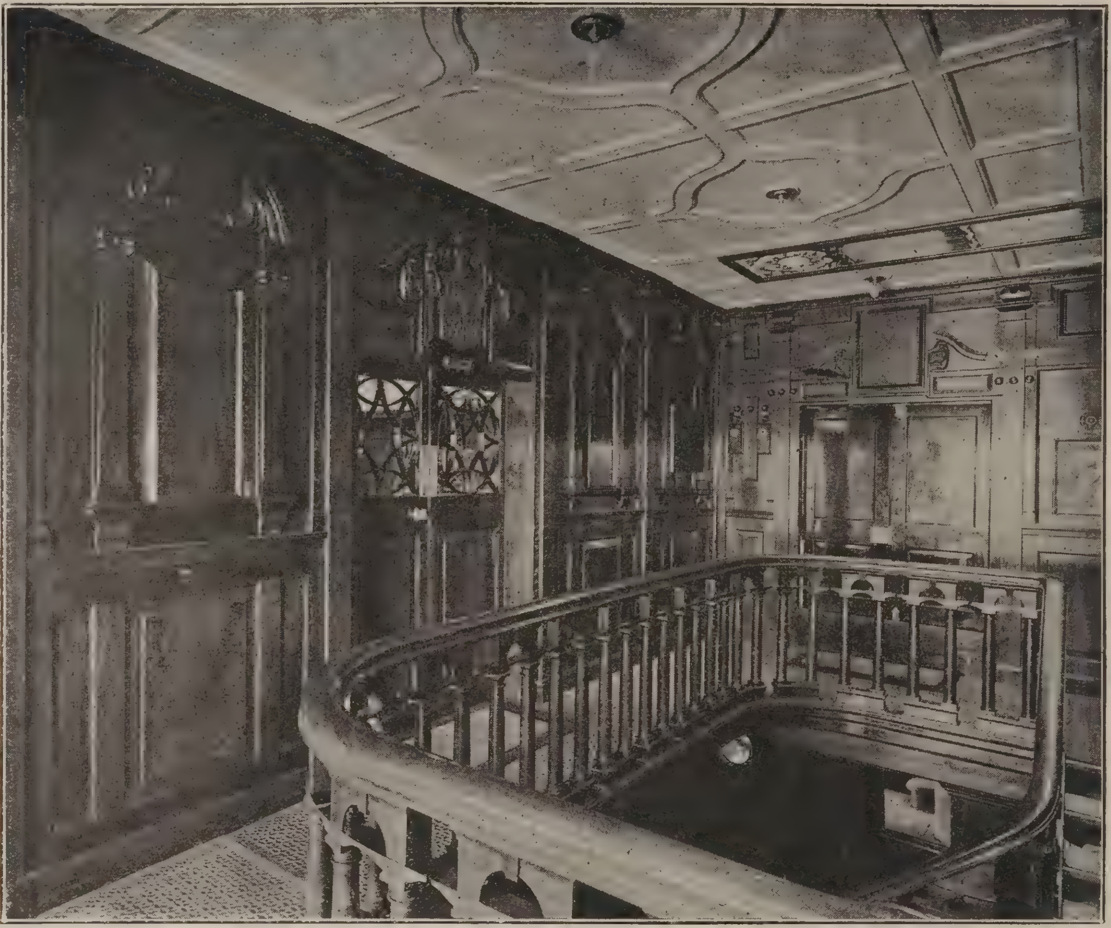
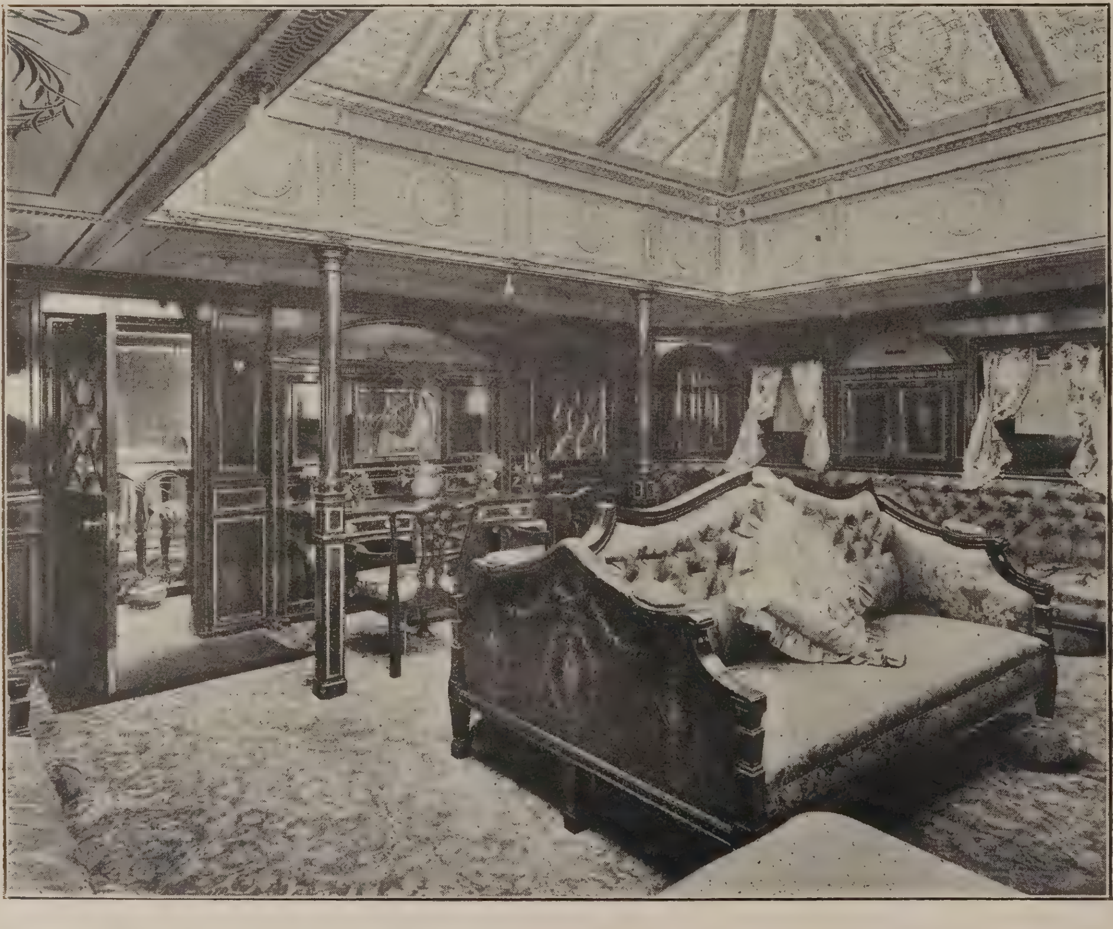


S.S. "CARISBROOK CASTLE": THE STAIRCASE. NIVEN AND WIGGLESWORTH, Architects.



S.S. "DUNVEGAN CASTLE": THE DRAWING-ROOM. NIVEN AND WIGGLESWORTH, Architects.

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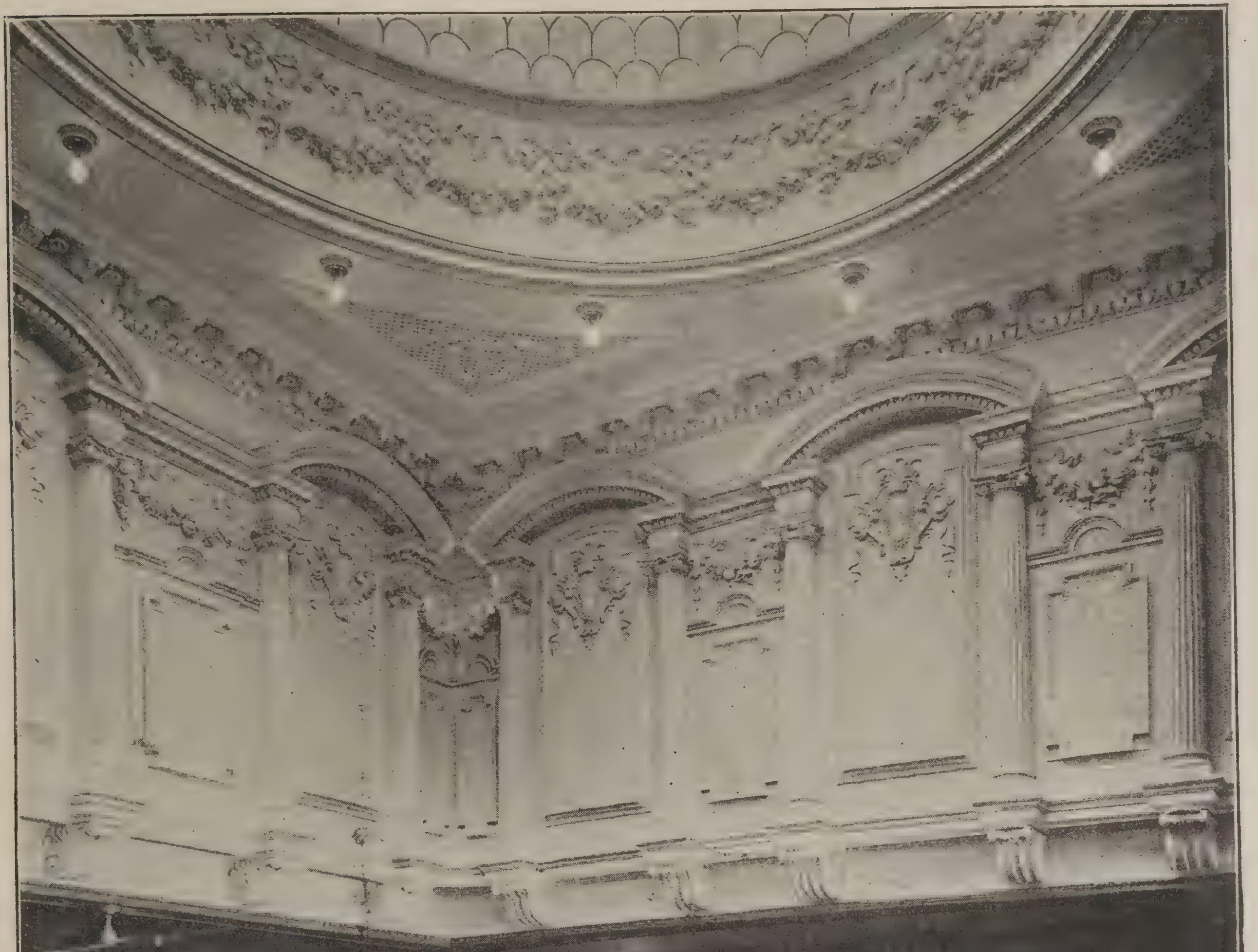

S.S. "CARISBROOK CASTLE": THE DINING SALOON. NIVEN AND WIGGLESWORTH, Architects.

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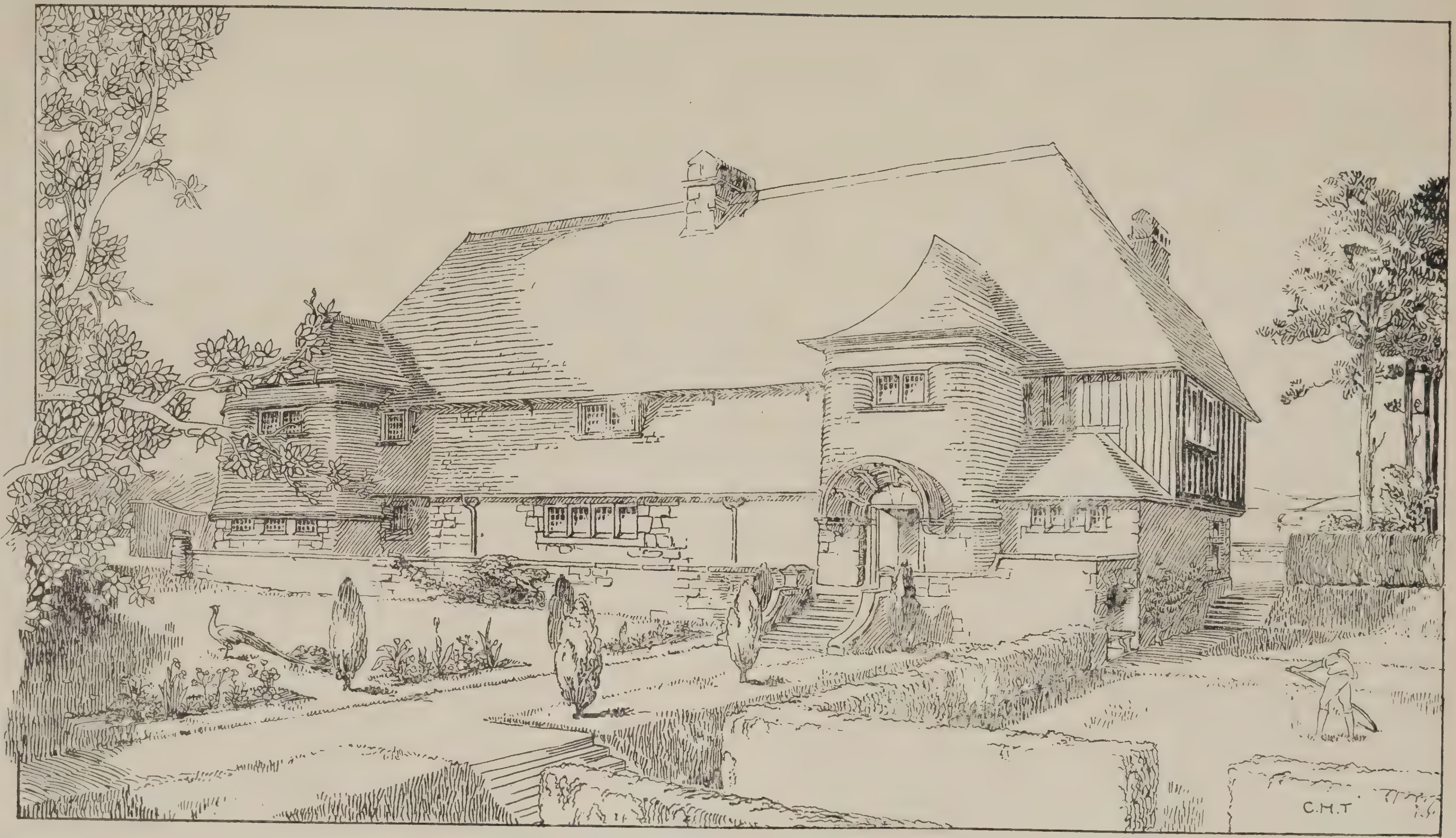

THE ENTRANCE FRONT, "CLIFF TOWERS." C. Harrison Townsend, F.R.I.B.A., Architect.

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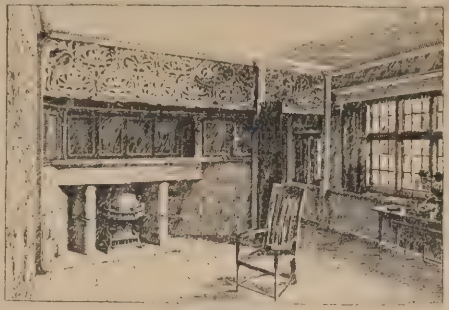
Bricks and Mortar.

APHORISM FOR THE WEEK.

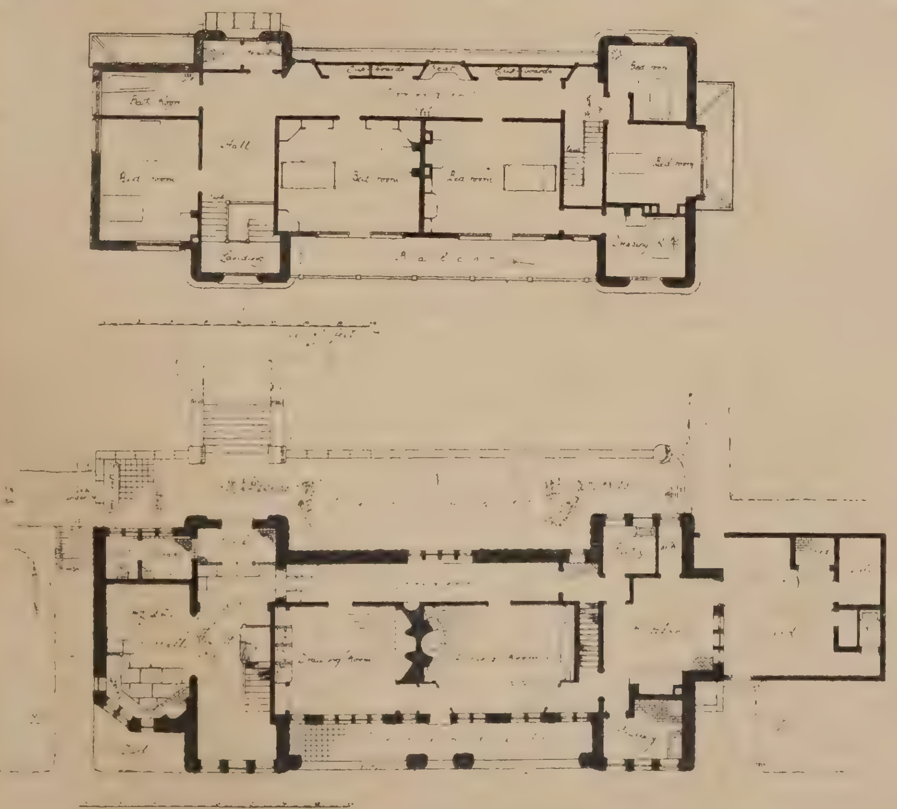
A house is never perfectly furnished for enjoyment unless there is a child in it rising three years old, and a kitten rising six weeks.—SOUTHEY.

Our Plates. "CLIFF TOWERS," by Mr. C. Harrison Townsend, F.R.I.B.A., was designed for a site on the Devonshire coast. The architect started with the principle that each of the rooms should face full south, all leading out of a wide corridor on the north side of the house. This corridor is of sufficient width to allow furniture—such as cabinets—to be disposed along its sides and to permit a fixed seat to be arranged in its window. Both the drawing-room and the dining-room open on to the verandah, not directly, however, but by means of a porch, the double doors of which prevent any possibility of the draught which is the bane of garden doors. The verandah and balcony are treated as integral parts of the house, and not as the flimsy wooden afterthoughts one is apt to see. The bird's-eye perspective and south elevation (see centre plates) show this. The lower part of the fireplace end of the drawing-room, which is illustrated on this page, is intended to be in delicate grey-green Cipolino marble, with the upper part carried out in oak, unstained and slightly waxed. The openwork frieze, in the same wood, is treated with a conventional design, and will have some of its features emphasised by light points of colour; the tips of the leaves, for instance, will be touched with green, smudged or wiped off, so as to leave the greater part of the leaf the natural colour of the wood. The floor will be of pine, stained a light green and beeswaxed. The dining-room will be treated throughout in plain deal panelling painted white, with a mantelpiece of dull copper showing a free use of the hammer on its surface. Oak, slightly beeswaxed, will be used for the floor. The chimney-piece in the hall will be entirely of red bricks with wide mortar joints. The floor here and in the corridor will be paved with the local dark-green paving-stone in large squares. Before leaving the ground floor it should be mentioned that the serving-room occupies the space under the servants' or back stairs, and the sideboard is placed in a recess which will be ceiled at a lower level than the rest of the room, in consequence of the upper flight of the servants' stairs passing over it. The kitchen will be lined inside with glazed bricks of very pale green. With the exception of parts of the drawing-room and dining-room, the use of wall-paper will be avoided throughout the house, plain unmoulded panelling being employed in its stead. The panelling painted white need not necessarily occupy the whole height of the wall, and where it does not, the plaster above may be distempered a quiet tone of clear yellow. Local material is to be used for the exterior of the house. This can be selected of a very soft and interesting green tint, and would harmonise effectively enough with the grey-green Tilberthwaite slates, used also for the battered wall-face on the north elevation, for the towers, and for the roof in general. The gnomon of the sundial, also illustrated on this page, consists of a figure of Time, whose scythe casts the shadow that tells the hour: the inscription would be Austin Dobson's lines:

> "Time goes, you say? Ah, no!
> 'Tis Time that stays; *we* go."

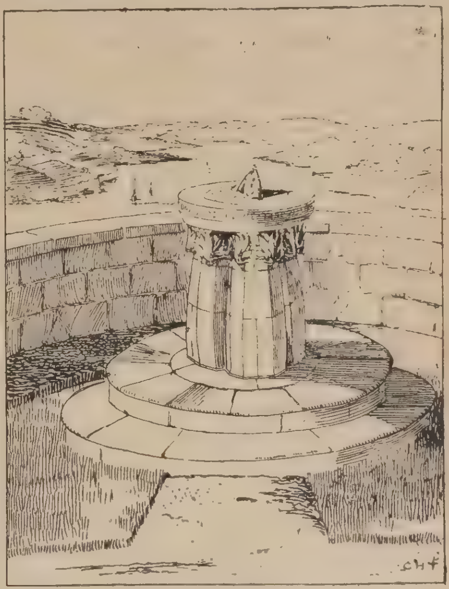


FIREPLACE END OF DRAWING-ROOM AT "CLIFF TOWERS." C HARRISON TOWNSEND, F.R.I.B.A., ARCHITECT.



"CLIFF TOWERS." GROUND AND FIRST FLOOR PLANS. C. HARRISON TOWNSEND, F.R.I.B.A., ARCHITECT.

Decoration of Ship Interiors. IT is only within the last few years that opportunities have been given to the artistic consideration of the principal apartments in a few of the larger "liners." Even now, however, the plan is usually determined before the architect is consulted, and he is merely permitted to treat decoratively certain given surfaces, without having any voice in many matters where his influence would be beneficial. A saloon over 50ft. square and about one-seventh this figure in height is not easily made shapely without supports or screens to emphasise any particular dimension. The personal note is also necessarily absent, and the design must therefore have fuller interest and be more than a background which is satisfactory in most domestic interiors, but beautiful woods and the best of workmanship are at the architect's disposal, and these bear investigation even if some of the artistic qualities are lacking. In the drawing-room of the s.s. *Dunvegan Castle*, by an expressed wish, a motive was adopted from Adams' work. The panelling is of mahogany inlaid with satinwood and pearl. The ceilings are ivory white and gold. The saloon of the *Carisbrook Castle* is in oak slightly fumigated and dull polished. In the staircase of the s.s. *Carisbrook Castle* dull-polished teak is used. Messrs. Niven and Wigglesworth were the architects for Messrs. Donald Currie and Company, and the work was done by the Fairfield Shipbuilding and Engineering Company, of Glasgow. The works are illustrated in our centre plates.



SUNDIAL AT "CLIFF TOWERS." C. HARRISON TOWNSEND, F.R.I.B.A., ARCHITECT.

The Five Architects. IT is interesting at this time to mention briefly the chief works of the five architects who, it is stated, have been chosen to submit designs for the Queen Victoria Memorial. Mr. Thomas Graham Jackson, R.A., was formerly a Fellow of Wadham College, Oxford, and was the architect of six of the existing college buildings of that University, in addition to which he restored the Bodleian Library and the churches of St. Mary and All Saints'. He also designed the new buildings of the Inner Temple and of Rugby and several other public schools. Mr. Aston Webb, A.R.A., was vice-president of the Royal Institute of British Architects from 1893 to 1897. He is the architect for the Victoria and Albert Museum now in course of erection at South Kensington, and he built the Royal College of Science in the same quarter. In conjunction with Mr. E. Ingress Bell he built the Victoria Courts at Birmingham and the Royal United Service Institution in Whitehall. Mr. Ernest George has erected well-known mansions in all parts of England, including Monk Fryston, Yorkshire; Ossington Hall, Nottinghamshire; and several churches. Sir Thomas Drew, of Dublin, is at the head of his profession in Ireland, being President of the Royal Hibernian Academy; and Dr. Rowland Anderson, of Edinburgh, occupies a somewhat similar position with regard to Scotland.

A Glasgow Bank. THE premises of the National Bank, so long a striking feature of Queen Street, Glasgow, are soon to disappear in order to make way for a huge warehouse, which will, we understand, cover the entire site and obliterate the court that at present surrounds the premises of the bank. The front part of the National Bank's premises was erected in 1845.

The building was in more recent times extended by the addition of the portion at the back. The architects were Messrs. Gibson & Macdougall, of Glasgow, and the design is understood to have been specially the work of Mr. Gibson, who later in life left Glasgow and took up his abode in London. The architects of Glasgow, recognising the loss which will be caused to the city by the disappearance of so fine an example of architectural work, are moving in favour of its being transferred to some other site. District libraries are wanted at present by the Corporation, and the bank premises might be adapted for one of them without much difficulty and at comparatively slight expense. The building and the adjoining blocks of warehouse property will soon be in the hands of the contractors, and are scheduled to come down at an early date. If anything is to be done for the preservation of the pile it must be done at once. It is to be hoped that the Corporation will give favourable consideration to the scheme, and save for the city a building which, if not acquired by them, must soon be reduced to mere "building material."

Caretakers of Old London. A MEETING of the committee for the Survey of the Memorials of Greater London was held last week. Mr. C. R. Ashbee, in presenting a brief report of their work, pointed out that they had concentrated most of their efforts on the parish of Chelsea. Their efforts in regard to the interesting little building in the King's Road known as Box Farm had not been successful, for the building had been demolished; but they had managed to keep some record of it. They had also had something to say in the matter of the proposal by the London County Council to run trams along the Chelsea Embankment, as it was felt by many that the lines should take another course. It had been mooted that a scheme was on foot for the destruction of Dr. Keen's house in Chelsea and for building on the site either a theatre or a music-hall, and he thought that the committee should take what steps they could to prevent any such action being taken. They now had a good collection of drawings and photographs, by means of which they hoped to get the people of London to recognise how beautiful were many things that surrounded them. Sir R. Hunter moved that the first volume of the register of the committee should be formally presented to the subscribers, and stated that it had been published by the London County Council. Referring to the proposed demolition of Christ's Hospital, he said it would be a most serious loss if the site of this charming and interesting building were to be covered by streets and buildings. Every effort should be made to oppose the Bill now before Parliament dealing with the matter in order to rescue from the hospital a certain proportion of the open space and some of the more beautiful of the old buildings. The chairman (Lord Monkswell) said that the matter had been before committees of the London County Council, who were now considering what form their opposition to the Bill should take. It was thought that, if the promoters obtained powers to override the Disused Burial Grounds Act and build over the burial ground, they should at least give up an equal amount of ground as an open space. He mentioned that the creation of the new Historic Building Committee of the London County Council was largely due to the efforts of Mr. Ashbee.

Discoveries in Chinese Turkestan. NEWS has been received in this country of some important archæological discoveries in Chinese Turkestan. The Takla Makan desert, now one vast expanse of sand-dunes, and, during a great portion of the year, the scene of raging sandstorms, was formerly the site of a flourishing civilisation. Dr. M. A. Stein, of the Indian Educational Department, is at the present time carrying out, under the orders and at the expense of the Indian Government, a systematic exploration of some of the ancient sites in this now deserted and desolate region. For a number of years past it has been recognised that this old civilisation was, to some extent at least, of Indian origin. To the north of the present Mahomedan shrine of Imam Jafar Sadik, where the river Niya disappears in the sand, the wooden houses and Buddhist monasteries, situated amid the orchards and the avenues of trees, the trunks of which still remain in the ground, have yielded up great numbers of inscribed documents, as well as works of art, household objects, and antiquities of every kind. The art of the clay seals discovered is said to bear traces of Græco-Roman influence, which has long ago been recognised in the sculptures of the extreme north-west of India that have been brought to England in such quantities since the recent military operations on the frontier. There can be little doubt that these discoveries will prove to be of the utmost interest for the early history of Central Asia.

Mr. Harry Furniss on Public Statuary. WHEN opening the seventh Free Picture Exhibition at West Ham, Mr. Harry Furniss criticised the statues and monuments which were placed in the streets and public places of our great towns. The question of their style was raised at a great and solemn public meeting at the Mansion House on the previous Tuesday, when Sir William Harcourt said:—"We have much to be proud of and to be thankful for, but I do not think we can boast of our monuments. This we believe to be an age of progress, and it is more necessary that we should progress in our capacity for monumental commemoration. I hardly know of one that, even in this great metropolis, the greatest city in the world, is deserving either of the greatness of the Empire or the greatness of the city." He himself agreed with those remarks, and would assert that the man in the street had a right to be protected from these ugly masses of masonry and dead black figures which offended the eye generation after generation. The two things which always struck him when he entered an English town where the crookedness of the lamp-posts and the ugliness of the statues. In the end the alteration of these things must be left to the man in the street. He could not see where the satisfaction came in for worthy members of society to have their ugly figures dressed in badly fitting clothes put up in public places and handed down from generation to generation. There was little doubt that favouritism was directly responsible for a great deal of the bad work in our public streets, and he might be permitted to give it as his opinion that that would be the rock on which this great proposed memorial to the Queen about which they heard so much would split. They were at present on their mettle, trying their best to show the world that they could at least produce one memorial worthy of this great country, but that would never be arrived at until it was open to everybody, no matter in what walk of art, to send in suggestions or models which might be submitted to public view and the public judgment taken upon them.

A Drastic Committee. HE wanted to revolutionise the whole of the monuments and statuary in England; he wanted a committee formed which he might call the "public art reform committee," and that committee should go through not only London, but the whole country, and report upon the statues which ought to be underground. They might keep some statues as pillories to public men, and not as monuments to their memory, as was at present the case. It might be well that some of the houses in which celebrated men had lived should be preserved. At the present time there was some hesitation about Hogarth's house, and it would be a great shame if it were not preserved and acquired by the nation. But in the matter of their public monuments more taste and regard for congruity should be observed. For instance, Cleopatra's Needle was as much out of place on the Thames Embankment as a London omnibus would be on the banks of the Nile. It was by such exhibitions as the one he declared open that they were educating the East-ender to teach the West-ender something in the matter of artistic taste'

A NEW HOSPITAL AT HALIFAX.

A NEW HOSPITAL has been erected at Salterhebble by the Halifax Board of Guardians. The hospital stands on a site of about twelve acres, about a mile from Halifax on the Huddersfield road. Plans have been prepared by the architect, Mr. W. Clement Williams, F.R.I.B.A., of Halifax, for accommodation for 642 patients, in addition to which there are beds for about 100 nurses and servants. The total estimated cost is about £130,000. To meet the immediate requirements only provision for 400 beds, together with the complete scheme of administration buildings, has been made at present. The Nurses' Home contains accommodation for nurses and probationers, including general and separate sitting-rooms, library, dining-room, and lecture-room. There are in this block over seventy bedrooms. Immediately behind the Nurses' Home, the first floors being connected by a three-arched bridge, is the administration block, the ground floor of which is devoted to porters' rooms and store-rooms. The first floor is set apart for committee-rooms, doctors', stewards', and matron's offices and sitting-rooms, dispensing and matron's stores, with electric lift from the basement. There are also a large kitchen and a scullery, with larder, &c. On the south side of this floor is an isolated receiving pavilion connected with the main building by a bridge. On the same storey of the eastern block are the assistant medical officer's apartments. The chief medical officer will be provided with a separate residence. The other administrative buildings are the electric light and power station, placed below the ground level, the boiler-house and disinfecting station, and the laundry.

The buildings already referred to occupy the centre line of the site, which runs from east to west, and the ten pavilions for patients (five for each sex) are placed in two lines, one on the north and one on the south side of this central block. Corridors connect the administrative buildings with the pavilions, all of which are connected by one-storey corridors with service subways underneath them. The subways allow of any pavilion being served from the kitchen or store without the hospital corridors being used. Eight of the pavilions are oblong and two storeys high, while the remaining two are circular, and three storeys in height. Outside the general hospital scheme and entirely isolated are two small pavilions for maternity cases, each containing four beds. The mortuary will also be an isolated building.

A NEW CHURCH AT WALTHAMSTOW.

A UNITED Methodist Free Church at Walthamstow has been opened. The buildings are erected on a prominent site at the corner of Shernhall Street and Oliver's Road, in Early Decorated Gothic style. The church is flanked on one side by a square tower, which rises to a considerable height. A large church parlour is placed alongside the church on the opposite side. The facings are of red brick, with Bath-stone dressings. The roofs are of green slates. Boldly moulded triple arches of Bath stone, supported by Norwegian granite shafts, with carved caps, divide the nave from the apse, where the choir and organ are accommodated. The choir has a traceried stone front, or dwarf screen. The pulpit occupies the space under the central arch, and is the centre from which all the seating radiates (the seats being circular on plan), so that all the congregation immediately face the preacher. The roof is of hammer-beam construction, with open timber spandrils of tracery work. The metalwork is all of wrought iron and copper. The church will accommodate about 750 persons in a mixed congregation, all on the ground floor. Provision is made for a future small end gallery to accommodate about 100 persons. The contract was let to Mr. J. A. Carter, of Grays, Essex, for £5,609. The architects, whose design was selected in competition, are Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5 Clement's Inn, Strand, W.C.

Builders' Notes.

Mr. Johnson, builder and clerk of the works at most of the Board Schools which have been built in Middlesbrough, died last week.

The Development of St. Anne's-on-Sea is still being kept up. The Land and Building Company, early promoters of the town and owners of most of the land, have decided to pay 9 per cent. dividend, and owing to the great yearly increase in visitors, to apply for a provisional order to widen the pier from 18ft. to 34ft., increasing the pier-head area from 1,400yds. to 4,600yds. A pavilion is to be built to accommodate 800 persons. During the year plans for 111 houses and shops were submitted. The opening out on the north-west is expected to produce one continuous town from Lytham to Blackpool.

The Building Trades Exhibition which opens on the 17th inst. at the Royal Agricultural Hall and remains open until the 27th inst., will be the largest and most representative in point of exhibitors of its kind. Every foot of the ground-floor space has been allotted. Special sections are this year being devoted to fire-prevention and smoke abatement. Visits to the Hall, as in previous years, will be paid by professional institutions interested, the date of which will be given in next week's issue. Lord Wolseley is prevented from opening the Exhibition owing to the fact of his being sent as Ambassador to foreign Courts, but Lord Roberts has kindly consented to pay the Exhibition a visit between the dates above named.

Proposed New By-laws for Liverpool.—Drafts of a new set of by-laws have been issued for presentation to the Liverpool City Council. One lot has reference to new buildings, ashpits and the removal of house refuse; and it is therein provided, with respect to the structure of foundations of new buildings for securing stability and for purposes of health, but every person erecting a new domestic building shall cause the whole ground surface or site to be properly asphalted with natural asphalt on a suitable foundation, or to be covered with a layer of good cement concrete, at least four inches thick. Provision is also made with regard to bringing the site up to the level of the surface of the ground immediately surrounding and adjoining it; and as to ventilation it is set forth that six inches of space must exist between the surface of the site and the floor, such space to be thoroughly ventilated by means of suitable and sufficient air bricks, or by some other effectual method.

Slump in the Red Brick Trade.—Building-brick makers in the Oldbury, West Bromwich, and Tipton districts are now passing through the severest crisis experienced for many years. Twelve or eighteen months ago prices of common red bricks were raised to an unusual height by the rapid development of house building, not only in the immediate neighbourhood of the works, but also in London, Birmingham, and other large towns. Prices realised about 34s. per thousand, compared with the normal rate of about 20s. On the strength of the "boom" old brick works were extended and new works opened, causing the production of builders' bricks to reach enormous proportions. The extra demand for slack for the brickworks was an important factor in raising the price of that article from about 6s. to 10s. per ton. The usual result of over-production has followed in the slump now experienced, as most of the chief brickworks in the districts named have been working short time with no immediate prospect of improvement, while prices have been slowly declining for the last three months. Instead of 34s. per thousand the present selling price is anything between 25s. and 18s., and even a lower price is mentioned where large contracts have to be tendered for. Building operations in all the district towns seem to have been for a time suspended by common consent until the price of slack and consequently that of bricks, is further reduced. More than half the present price of bricks is said to be absorbed in fuel, leaving little or nothing for labour and establishment charges.

The Builders' Accident Insurance (Limited) held its twentieth annual meeting at the offices, 31 and 32 Bedford Street, Strand, last week, the chairman, Mr. Stanley G. Bird, presiding. The report, which was adopted, stated that the company had received notice of 1,767 accidents during the year 1900. Although owing to various causes, there had been some falling off in the premium income during the year, the directors were satisfied, from the financial result, that the care which they had exercised in taking and discriminating risks had not been without advantage to the company, which was now in a very satisfactory position. The directors had decided to enlarge the scope of the policy relating to risk of accidents to the public, and also to undertake the driving risk. The Board reported with regret the retirement of Mr. J. C. White through ill-health. The retiring directors—Mr. T. Barnsley, Mr. Woodman Hill, Mr. A. Krauss, Mr. W. Nicholson, and Mr. G. H. Trollope—were re-elected.

THE CHESTER ROWS.

A New Theory of their Origin.

By GUY WILFRID HAYLER.

THEORIES on the origin of the far-famed, picturesque, and historic Rows of Chester have been both many and ingenious. Mr. H. D. Harrod, F.S.A., in a studious paper on the subject (see page 120 of the BUILDERS' JOURNAL for March 20th), says the origin of the Rows must be sought for in Ancient Chester, and that without any great revolution in design or architecture the Rows have developed by a natural growth on the lines of the ancient design of Roman Chester. This seems to be merely a reiteration of the views of Pennant, who has written that "these Rows appear to me to have been the same as the ancient vestibules, and to have been a form of building preserved from the time that the city was possessed by the Romans. They were the places where dependents waited for the coming out of their patrons, and under which they might while away the tedious minutes of expectation. Plautus, in the third act of his 'Mostellaria,' describes both their station and use. The shops beneath the Rows were the *cryptae* and *apothecae*, magazines for the various necessaries of the owners of the shops."

Another antiquary, Ormerod, differs from this opinion and says that he does not think they are so old, but believes that the Rows were erected as galleries, from which the citizens might defend themselves from the attacks of any bodies of cavalry who might have forced the gates, during the wars between the English and Welsh. This is very feasible, as architecture in the Middle Ages was constructed to a great extent on a military and defensive basis. In later times the Rows did certainly act as protective agencies, and the possession of them in the days of the Civil War decided the occupation of the city by either the Royalists or Parliamentarians.

But in my opinion—and I tried to look at the matter from an independent standpoint during a considerable stay in Chester recently—the origin of the Rows is to be looked for in another direction altogether.

It seems to me that the annual procession of the Chester Minstrels and the holding of the famous Chester Plays must have had a great deal to do with the construction of these galleries.

As is well known, these plays took the nature of open-air pageants, and were very similar to the *masques* which are held to this day in many parts of the Continent. They were performed every year at Whitsuntide. A scholarly edition of the plays was published nine years ago by the Early English Text Society.

It does not need great imagination to conceive that if these great spectacles—and undoubtedly they were in many senses *great* in their day—were held annually they must have affected the nature of the buildings of the various streets they passed down.

Year after year as the festival came round the pilgrims flocked to Chester—welcome customers for the inns, hostelries, and shopkeepers. What was more natural than that the citizens prepared for the gala and designed their houses so that they had a gallery for spectators? And this gallery harmonised with the general scheme of architecture, proving a convenient and useful adjunct. It seems one of the most feasible theories to account for the construction of these famous "Rows," the like of which is seen nowhere else in the world. The open-air pageantry and carnivalism of the Middle Ages had every opportunity for display in Chester, and one cannot help thinking that the Rows were constructed as the theatrical galleries of these processions.

A SOLDIERS' SWIMMING BATH AT ALDERSHOT.

A NEW soldiers' swimming bath is being erected just south of the Headquarter Gymnasium in Queen's Avenue. A flight of stone steps leads into the glass portico, from which two glass swing doors lead into the entrance vestibule. This is situated directly under the dome, which is carried on a circular steel ring girder, supported by artificial stone arches springing from the four piers that stand at the corners of the entrance hall. These piers are faced with blue grey and vandyke brown enamelled bricks up to half their height, the top portion being artificial stone. In one corner of the hall a staircase leads up to the balcony that overlooks the vestibule, which is fitted with ornamental iron railings painted peacock green. Beneath the staircase is a ticket office, and opening out of the hall and balcony are storerooms and lavatories. The floor is paved with polished Italian mosaic, and the hall is lighted by numerous windows around the base of the dome. To the right of the hall two sets of swing doors open into the bath. The bath itself is 100ft. long by 40ft. wide, varying in depth from 3ft. 9in. to 8ft. 9in , and is paved with white glazed bricks and lined with white Minton glazed tiles. The bottom is divided into eight longitudinal sections by lines of blue glazed bricks, for the purpose of forming tracks for swimming matches. Around the top of the bath and under the stone edging a scum trough is fitted, which carries off any objectionable matter, and at one end is fitted a perforated pipe for spraying the surface of the water to remove floating particles of dirt, &c. The bath has a capacity of 165,000 gallons, and is filled by a 6in. pipe direct from the main, and is emptied by an 18in. drain. Around the bath are dressing boxes, fitted with seats, foot gratings, and clothes pegs, and in the corners flights of stairs lead to the spacious gallery above, which runs round the four sides of the building, and is fronted with an ornamental iron railing. At the east end the central portion of the railing runs back on wheels, and here will be fitted the high diving board, 12ft. from the surface of the water, the space afforded by the alcove behind giving the necessary run. The bath is lighted by high lantern lights in the roof extending its whole length. A set of tinted fanlights are let into the north wall above the gallery, and, with the lantern lights, give light to the building. Ornamental steel girders support the roof, and are fitted with rings to attach gymnastic apparatus to. From the gallery two sets of swing doors open on to the gallery over the vestibule, giving entrance direct from the road for spectators. The walls in the interior are left of the natural red brick, and the roof is shining white, the ornamental girders light blue, and the gallery railings peacock green. The woodwork is stained dark oak, and the supporting columns are painted Pompean red and white, divided by a black band. Beneath the entrance hall is a boiler-room, fitted with an enormous boiler, nearly 30ft. long and over 20ft. in circumference. This will furnish the bath with hot water, and supply the steam radiators fitted to warm the building. A subway leads round the whole bath, in which the pipes are laid, thus affording the workmen easy means of attending them. The furnaces are connected with the shaft that rises 60ft. behind the building. The architect is Mr. F. J. Smith, F.R.I.B.A., of London, and the builders are Messrs. J. Bottrill & Sons, of Reading.

THE GROUPING OF PUBLIC BUILDINGS IN A GREAT CITY.*

BY C. HOWARD WALKER, F.A.I.A.

THE title of the paper that I have been asked to prepare implies the admission of the fact that buildings of any description gain in effect by being grouped, and that isolated buildings, of whatever individual merit, are insignificant in comparison with massed constructions, even if these latter be comparatively mediocre in quality. It requires but little argument to uphold this statement. Every famous architectural pile in the world testifies to it, and the buildings of modern expositions are additional witnesses. It is, then, a manifest waste of opportunity to erect monumental buildings so far apart from each other that they cannot be seen together excepting from a balloon.

The fact admitted that buildings should be massed, the conditions influencing such massing are next to be considered. Primarily they are

Conditions of Utility.

Buildings are placed where they will do the most good, where they can be the most conveniently approached, and will hold the most practical relations to each other. If these conditions are allowed to act, all public buildings are naturally gregarious. There is one other important factor: that of the avoidance, so far as may be, of the disturbance of existing conditions. From these conditions have resulted the Ring Strasse of Vienna, the boulevards of Brussels, Antwerp, and Frankfort, and the consequent placing of important buildings upon them. The demolition of ancient city walls and subsequent filling-in of moats gave room for municipal improvement without demolition, and preserved a tradition while embellishing the city.

The mediæval city market or meeting-place, whether within or without a citadel, no longer exists as the pulsing heart of a city, for the cities have become of such extent that squares or places must multiply in number. What in the old days was the heart has now become a series of ganglions or nerve centres, connected by avenues, parks, or boulevards. What was formerly a *coup d'œil* has become a series of points of interest which should not have mean approaches. The picturesque masses of castles and cathedrals were the more interesting from the contrasting hovels clustering around their feet, but the dignity of modern civic buildings does not accord with such a setting. The city of to-day has grown too large to be picturesque; its avenues are too broad, its spaces too vast, its distances too great. Accident must give place to intention, or the general effect of the city will be haphazard, incongruous and incomplete. The impression of incompleteness is characteristic of American cities for the reason that, with few exceptions, they have either no initial scheme in plan or a meagre one. There is, it is true, the numbered and lettered gridiron plan of Philadelphia and Chicago, which "grinds down their stones to a pale unanimity," in which all streets are alike and one view as good as another, but such planning can hardly be considered an achievement.

Washington

has a plan of a higher type and greater possibilities, and in spite of the numerous indignities to which it has been submitted, it still gives the city its individual character and much of its undoubted attractiveness.

This plan is based upon centres of interest, not too far apart to be seen from each other, and, therefore, vistas terminate with a monument, sculptural or architectural. This is a very great gain, and exists in only two other cities—Paris and Rome. Nothing is more ignominious than a broad avenue leading to nothing, and fading away at either end into the frayed skirts of a city.

The same mind that first conceived a plan where all streets were alike arose to a loftier height of inspiration and introduced final perfection into his plan by assuming that a very broad, perfectly straight avenue of infinite length was the finest possible street for a great city. There can be no greater blunder in planning. What is more wearisome than endless streets of which the destination cannot be foretold? All scale is lost by too long perspective; and unless avenues are viewed from an eminence or are terminated by an important mass of buildings raised high in the air, it is safe to assume that half a mile is quite long enough for any uninterrupted vista. One of the fundamental principles of architectural planning is that of axes, upon which are strung both the voids and solids of the masses of building. A great avenue is a great axis, a great void, but it should not be that alone; it should lead to the greater solid masses at either end. It is important, then, that the chief buildings should be, not upon the sides, but upon the axes of great avenues, and, in fact, in most cases where the buildings have been first established, the axial avenues have later been constructed by demolition. Unfortunately, the reverse process does not as often occur. The avenue once established becomes a public right-of-way, and there is nothing so repugnant to the Anglo-Saxon mind as to interrupt or interfere with anything which has once become public property. Even bridging a right-of-way is considered an injustice; it must remain open to the stars themselves. Fortunately, in Washington, the necessity for constructing centres of interest on the axes of avenues is not felt. They already exist. The danger seems to be this: that the sides of the existing, or to be created, avenues are held to be adequate sites for new Government buildings, while in point of fact those buildings should be built upon their axes. Unter den Linden, in Berlin, is, in this respect, an excellent object lesson. Despite some admirable buildings upon its sides, such as the Russian Embassy and the Arsenal, this famous avenue is ineffective until one end is reached, when the Brandenburg Gate, a puerile imitation of the Propylæa, is thrown frankly across its axis, and at once dignifies it. At the other end of the Unter den Linden is a marvellous example of purposeless planning. There is prevalent another impression in regard to great avenues, which is this: that a bridge is of greater value and merit than the avenue leading to it, and can be considered as a terminal unit, and that it is of greater importance than the avenue leading to it. As a matter of fact, a bridge is an integral part of the avenue, and counts but little in effect when seen from the avenue.

The Question of Bridges.

The architectural merit of a bridge, which may be great, is seen from up or down the stream. Its artistic value as a monument is entirely due to the uniformity and symmetry of its sides and the contrast of open spaces to high façades, and to the treatment of its approaches. When the bridge is a very long one, any treatment of its centre, far from either bank, is necessarily isolated, and when such treatment is suggested by constructive conditions, as in the case of a draw, it need not be unduly exaggerated. In most cases the merit of a bridge is in its long horizontal reaches, its repetition of spans, and the introduction of perpendicular motives is unnecessary. On the other hand, the ends, or approaches, of bridges admit of admirable monumental treatment, and absolute symmetrical treatment of these approaches is not essential. One of the most effective bridges in existence is the old bridge at Prague, which is most unsymmetrical in treatment. Another is the bridge at Heidelberg. The great towers of the new bridge in London are most picturesque, but the length of the bridge is comparatively short, and the towers are but little isolated from the approaches at the ends. On the other hand, the long bridge at Worms, of a similar conception, is ineffective. The ends of bridges should open into spaces or squares, affording ample opportunity for approach and circulation. It is at these points that excellent sites for the erection of monumental buildings occur. An avenue leading to a bridge need not be considered of sufficient importance to warrant the erection of the chief buildings along its sides. There exists also the river frontage. Buildings upon such a frontage are effective under the following conditions:—

(1) When the stream is narrow and they can be seen from the opposite bank; (2) when they are near the ends of bridges and can be seen from the bridges; (3) when the stream curves, and the planes of the façades are changing to conform with the curve.

In all cases the embankment should be carefully treated on the stream side. A terrace set back from the river, leaving the bank unkempt and rough, abandoned to the accidents of river traffic, is not successful. The Elbe at Dresden is a case in point. It is well, if possible, to have ample space between the façades of the buildings on the river and the embankment, and to keep all wharves and commerce from the frontage, or confine it to defined and isolated points. The treatment of a river-front must be undertaken thoroughly. Half-measures are sure to prove troublesome in the end.

In one essential American architecture has been peculiarly deficient—that is, in

The Monumental Treatment of Grades.

Abrupt changes of grades are not obstacles, but opportunities. We have been abundantly satisfied if our buildings were planted, not set—that is, if the surface were levelled for them and they had no apparent connection with the ground on which they were placed. The Capitol is one of the most admirable exceptions to this fault. There is nothing more attractive than walls, steps, terraces, balustrades, and buttresses, which are integral parts of most buildings abroad, and which, when the natural grades have not given excuse for their existence, have been deliberately created as necessary setting to the buildings.

In our case in Washington there is every opportunity for this class of work, and it is of infinite variety and advantage. It can be made to soften too great austerity of design, and to dignify too great license. In many cases the approaches to a simple inexpensive structure exalt it above a pretentious, but undeveloped, neighbour, and in any scheme for the embellishment of a city too much stress cannot be laid on these important accessories to the higher architectural achievements. Much of the beauty of cities of to-day also is due to judicious laws preventing unsightly structures, especially when these structures are erected by the municipalities themselves. For instance, it is a wise precaution that backgrounds to monuments, sculptural or architectural, should be, so far as possible, agreeable to the eye. There should be, therefore, civic laws which would make it impossible for any large, unsightly building, manufacturing or otherwise, to be erected in proximity to public buildings—that is, the city should have the power of approval or disapproval of the design for such proposed buildings. At present there is in Dresden a large power-house with a huge yellow chimney, being built directly behind the great opera-house, of which Dresden is so justly proud, and which was Gottfried Semper's best work. The Dresdeners have erected a statue to Semper in the square, but they have permitted this intolerable structure to dwarf everything about it.

In Berlin the great war-monument to the Emperor William has for a background a cheap furniture establishment, covered with signs, and a red and yellow brick industrial school. It is proposed to paint out the one and tear down the other, both of which would have been unnecessary if the monument had been well placed. If a monumental avenue is established, it would be well to follow the example of Buda-Pesth in relation to its great Andrassy Strasse — that is, there should be specific laws passed in relation to the façades upon the avenue as to height and character, and the existence of unsightly party walls should be made an impossibility. If possible the city should have similar control of the corners at the crossing of all great avenues, and of buildings upon the axes of great avenues. A final, apparently minor, detail is of the utmost importance.

Every city should control the designs and location of all flag, gas, electric, and trolley poles, of all kerbs and drinking-fountains, of all signs beyond a specified size, and of all kiosks. Many beautiful streets and buildings in foreign and our cities are made hideous by signs and kiosks.

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* A paper read before the thirty-fourth annual Convention of the American Institute of Architects.

These restrictive laws would be specific laws for specific and worthy purposes; they would be unjust to none, and calculated to appreciate rather than to depreciate real estate. Accident and disorder went far to make the picturesqueness of the ancient city. Its time has passed. Order and restraint are essential to the beauty of the modern city.

Thus far are general considerations applicable to all cities. It is now a question as to their direct application to Washington, in order to make it compare favourably with the great capitals of the world. Let us see what those capitals have done with their opportunities. In most cases they are upon rivers, and have taken advantage of the river-banks. In many cases they were walled cities, and when, under modern conditions, these walls were removed, their places have been taken by boulevards encircling the centre of the city. In either and in both cases public buildings have been placed upon the river embankments and upon the boulevards; in all cases bridges have been made monumental. In addition to this, eminences have always been considered as fitting sites for the most noble buildings. In most modern cities in Europe the condition enforced by the already existing remains of the past has made a comprehensive scheme of treatment difficult, and the most that could be done was to make the best of possibilities. Paris and Buda-Pesth are perhaps exceptions; in both cases nothing has been allowed to interfere with a broad, well-studied scheme. Overcoming obstacles and adapting conditions are very apt to add an additional charm to results, and to produce a more attractive, though less formal, city.

What some Cities have Done.

The different capitals of Europe have treated their problems as follows:—

London has chosen to make its river embankment and bridges its chief monumental feature, its great secondary feature being its parks. In no case are there fine vistas or impressive avenues in London, if we except perhaps Waterloo Place and the Duke of York's Column. The river-front is its great architectural effort.

Berlin has ignored its river, the Spree, which, while insignificant, could have been made attractive. There has been an effort made at the bridges. The great avenue, the Unter den Linden, is effective when it broadens before the Brandenburg Gate, which is thrown across it. At the other end it spreads into a waste of squares upon which the Opera House, the Palace, the Cathedral, and the old Museum are placed with little regard to grouping. As they are, however, all-important buildings, they make a very effective showing despite their careless arrangement. Outside the Brandenburg Gate is a long, wooded avenue leading through a park to Charlottenburg. At a little distance from the gate, crossing it at right angles, is the new Seiges Allée, or Avenue of Victory, with 16 exedras on either side, with a marble figure of a Prussian ruler in each, and on either side of the statue busts of his principal subjects. The avenue leads up to the Column of Victory, which is in the midst of a great circular place, on one side of which is the new theatre, and on the other the new Reichstag. The scheme of this avenue is fine, but it is somewhat disconnected from the city plan.

Dresden.—Here there is an effort to make the river effective. On one side is the new Finance Building, on the other the beginning of the Bruhl Terrace, with the façades of the Arcadneun and the Art Building The bridges are fine. The commerce of the river has been allowed to remain between the terrace and the stream, and the effect is the effect of incompleteness. The group of great buildings in the Schloss Platz, the Cathedral, Museum, Opera and Palace, while having little relation to each other, and no consistent scheme of plan, are like those in Berlin, from their importance and the fact that no mean environment appears, most effective.

Madrid.—The river is unconsidered; the Palace alone is well placed and effective.

Rome.—The river is now being edged with embankments and boulevards which some day will be attractive. The bridges are strong, vigorous, and effective. The magnificent scheme of approach to St. Peter's, one of the greatest architectural *tours de force* in existence, is too well known to need long description. The equally fine Plaza del Popolo, with the Pincio at one end and the new bridge leading to a long avenue and to St. Peter's, is the second great piece of architectural planning in Rome. All avenues in Rome have a terminal group of buildings, and its vistas are extremely fine.

Buda-Pesth is exceptional, inasmuch as it is essentially a modern city, and has been laid out upon a well-devised scheme, especial attention having been paid to the river-front and to the bridges, and a great boulevard, the Andrassy Strasse, being carried out to the pleasure parks. Upon the embankment only large and important buildings have been erected, with long façades in fact, in the entire length of the river-front, over a mile in length, there are but 23 façades, so that the importance and length of each can be imagined. In addition to this, the embankment is planted with trees, and is devoted to foot passengers only, carriages being stopped at the points where the streets and avenues debouch on the embankment. On the opposite side of the river, in the old town of Buda, rises the Palace, terrace after terrace, finely placed and set.

The Andrassy Strasse has harmonious buildings its entire length, there having been control of the design of the façades by the municipality.

Brussels.—The old mediæval square is one of the finest in Europe, but it has no connection with the plan of the modern city. There are two sets of boulevards—one around the city, occupying the site of the old walls, the other across the city, where the old canal formerly served for commerce. The other set is too far from the centre to be important. The cross boulevards are about thirty-five years old, and prizes of from 1,000 francs to 4,000 francs were offered for the best designs for façades. Many buildings were built from these designs, and the result is pleasing but not especially monumental. There are few effective terminations and vistas. The far-famed Palais de Justice, one of the largest buildings in the world, and certainly one of the worst architecturally, is well placed on an eminence, but with very poor approaches—bare and crude. The great Rue Royale leading to it has some good façades upon it, but they are juxtaposed to badly-designed mercantile buildings, and there is therefore no effect of *ensemble*, as in Berlin, Dresden, Vienna, Paris, or Buda-Pesth. The Palace is on a parked square, and is mediocre.

Frankfort.—Another city with interesting ancient central square, now left at one side, new boulevards taking the places of old walls, and in other respects a city of broad avenues with occasional monuments and fountains; not especially interesting.

Florence.—With its fine mediæval square apart, new boulevards instead of its walls, but without interesting buildings upon them, but with excellent bridges and good embankments on the river Arno.

Prague.—Apart from occasional old buildings, its entire interest centres upon its embankment, its fine bridge, and the magnificent situation of the Cathedral and Hradchin, or palace, on the heights across the river. The cathedral is not a great one architecturally, and the Hradchin is commonplace to the last degree, but their size and situation make them most impressive. The bridge is very elaborate, with end towers and arches, and heavy buttresses and high groups of statuary on its sides. It is extremely monumental.

Vienna has not made much of the embankments of the Danube, though work to that end is now in progress. On the other hand, its Ring Strasse, a very broad boulevard around the city in place of its former walls, is a very fine performance. All the principal buildings are on this Ring Strasse, and as its direction changes every few thousand feet, they are seen at the ends of vistas and at all points of view. They are vast in dimensions, and in most cases fine in design. The famous Prater is a great avenue through a wooded park, and, like all others of its class—such as the Avenue du Bois de Boulogne, the Thiergarten Avenue, the avenue at the Hague, the Cascine in Florence, &c.

Paris has taken advantage of every inch of its river-bank, and by the fine scheme of the Champs Elysées and the gardens of the Tuileries terminating at one end in the Arc de Triomphe and at the other end in the Louvre, and by the series of radial avenues from the Arc de Triomphe and the Avenue de l'Opéra, has created a series of architectural vistas unequalled in other cities. The restrictive laws in regard to buildings and the careful control of designs of monumental work in Paris is greater than elsewhere, and the effect is manifest in the streets of the city.

It is apparent that the most attractive cities are those where some broad and comprehensive plan of treatment has been conceived and adhered to, and where, if poor surroundings or inferior architecture forced itself into prominence, its effect was minimised either by planting-out with trees or by interrupting continuous vistas by a monument or building. Also, that in many cities the most attractive feature is merely a collection of the most important buildings, even if these are not planned in relation to one another. It is not necessary to be enamoured with the idea of magnificent distances. It is not within the capability of human effort to make all things in the range of vision agreeable to the eye. Let us minimise the difficulties and shorten the range of vision. A great city resembles an articulate animal: it is made up of a number of parts jointed to each other. It grows in that way. Each part must, however, be complete in itself, though subordinate to the general scheme. Let us apply this reasoning to

Washington.

By looking at the old plan of the city it is seen that there was a marked and definite initial scheme. Two great centres were created, one the Capitol, the other the White House; from these radiated the avenues, like spokes of a wheel. The main axes, however, of these buildings, which were at right angles to each other, were broadened into great parks extending west from the Capitol and south from the White House to the river—the park from the Capitol being naturally much larger than the other. It was manifestly first intended to erect important public buildings upon either side of this long park; in fact, they are indicated on the plan. This would have created a great National Court of Honour. In some ways it may be regretted that this scheme was not carried out; in others it may be the better in the future that it was not, as the plan was unnecessarily formal and uninteresting. There was, apparently, never any well-considered treatment at the crossing of the axes of the parks. At present the great monument is, then, not exactly on either axis, but sufficiently near for all purposes. The scheme went entirely to pieces when it approached the water-front, undoubtedly for good reasons, as the water-front was not established. This great scheme is still the base for the architectural treatment of Washington. It cannot be ignored. It is perfectly apparent from both the Capitol and Executive grounds and from the river. What up to this time has been done with it? It is perfectly evident that the original intention was that the White House should terminate the vistas of New York and Pennsylvania Avenues, which vistas are now closed by oblique views of the Army and Navy Building and the Treasury Building.

The Chief Architectural Problem

is, without doubt, at the crossing of the axes of the Capitol and of the White House. Here should be the nucleus for future architectural effort, and the Monument is sufficiently great and simple to be in nowise injured by the proximity of buildings. The White House vista will extend to the river; the Capitol vista may or may not, as conditions will decide. At at events, the axis will be cut across in some way at the continuation of Seventeenth Street. Between Seventeenth Street and the river, westerly, may be left as park-land, securing an uninterrupted and extremely effective view of the new monumental bridge. If buildings should be erected on this land, they should be so placed that they will not intercept the view of this bridge from the Monument grounds.

In every American city, without exception, the effect of the public buildings has been lost by their separation and isolation. This is as true of colleges and institutions as of Government and municipal buildings. The power of correlation of co-operation is as great in artistic effect as it is in practical action. There is a close relation between æsthetics and mechanics, and they have been too long divorced

The concentration of the chief buildings of a city in its acropolis or market-place is what has made the architectural grandeur of Athens, Florence, Venice, Buda, Moscow, and Paris. Imagine the grouped buildings of these cities separated and isolated in obscure places, and you go far to destroy the wonders of the world. On the other hand, imagine, if you can, the isolated best buildings of New York or Chicago, or of Washington, brought together into one group, and incongruous as they might be, they would be worth long travel to see. This, however, it is impossible to compass, but it is possible to consider the fact in future building, and it is also possible to unite existing buildings by arcades, colonnades, or even formal avenues of trees with balustrades and sculpture. It is a mistake to consider these of secondary importance. And we should not too much eliminate foliage. Only the great arteries of a city require unobstructed street surface. Elsewhere boulevards and squares are all the better for having grass and trees, and such planting and setting in connection with public buildings is most attractive. There is, as we know, an unusual opportunity to make our capital compare with the other great cities of the world the will is not wanting, neither do I believe i the ability to secure the wished-for result.

WORKING-CLASS DWELLINGS FOR SUNDERLAND.

THE Sunderland Corporation propose to erect dwellings for the accommodation of people displaced by the demolition of slum property in what is known as the "hat-case" area, and have advertised for tenders. Tenders have been invited before, but it was found that the lowest offer was £7,000 in excess of the estimated cost of the buildings. It was not considered advisable to incur this additional expenditure, which would mean the charging of higher rents for the houses; and therefore, in order to reduce the cost, the plans were modified. The abandonment of concrete floors has effected a saving on the estimate of about £2 000, and the substituting of cement for white-glazed facings on the staircases means a reduction of about £1,200. The buildings will consist of three blocks, each three storeys in height. The first block, 165 ft. long by 80 ft. broad, will contain six double-fronted houses, with rooms on each side of a common staircase, there being six rooms on each floor, divided off into tenements. The second block, 126 ft. long by 72 ft. broad, will be similarly arranged for six three-storey double houses. The third block, the smallest, will measure 70 ft by 40 ft., and will consist of three three-storeyed houses. The living-rooms will measure about 16 ft. 6 in. by 12 ft. 6 in., and the bedrooms 12 ft. by 12 ft. There will be one large common yard for each block, these being intended for playgrounds, drying spaces, &c. There are to be sculleries and conveniences—with water carriage—on each floor of all the buildings. Each block will be in charge of a caretaker, who will be held responsible for the order and cleanliness of the tenants. As to the rents, it is intended to charge 4s. 6d. per week for three-roomed tenements, and 3s. 6d. for those of two rooms. It is not decided yet whether or not any portion of the buildings shall be let off in one-roomed tenements.

A new Jewish Synagogue at Glasgow is being erected in South Portland Street. The architect is Mr. J. Chalmers.

A new Foresters' Hall at Dundee.—A large hall in Rattray Street is to be erected for the Dundee Courts of the Foresters' Friendly Society at a cost of £8,000. When the whole scheme is completed it is estimated to cost about £14,000.

TALLEYRAND'S CASTLE.

THE Castle of Valençay, the ancestral home of Prince Talleyrand and the place of exile for six years of Ferdinand VII. of Spain, situated on the Tours-Vierzon line of the Orleans Railway, is to be put up for sale, by auction, next month in Paris, at the upset price of £104,000. The estate is the joint property of the heirs of the late Duke of Talleyrand, Valençay, and Sagan, and its time distance from Paris is now about five hours, but by a new line which is being built it is anticipated that the journey will be shortened by about an hour. Among the lots comprised in the sale are the castle and its dependencies, the park, and the forest of Gatines. The castle is a magnificent Renaissance château, and after the forced abdication of Charles IV. of Spain in favour of his son Ferdinand, the Crown Prince, and the occupation of the Spanish capital by the French troops under Murat, Ferdinand having renounced the Crown of Spain unconditionally, it was assigned to him as a residence along with his brother Don Carlos, his uncle Don Antonio, his preceptor Canon Escoiquiz, and the Duke of San Carlos, an annual income being provided him from the Crown revenues of France. At Valençay he remained until in 1814 he was placed on the Throne of Spain after the splendid victories of the British in the Peninsula had compelled Napoleon to evacuate the country.

QUEEN VICTORIA MEMORIAL.

WHAT MR. LEONARD STOKES, MR. BENTLEY, AND MR. SETH-SMITH THINK OF THE SCHEME.

A FEW prominent architects have given to the Press their opinion on the decision of the committee in regard to the Queen Victoria Memorial. The president of the Architectural Association, Mr. Seth-Smith, while anxious to say nothing against the chosen few, was unhesitatingly of opinion that the list did not even approximate to the best men, and that the limitation to five was disastrous.

"It is necessary to have a very much wider field," he declared, "before a really worthy memorial can be secured. In the first place, sketch designs should have been invited from a large number of architects, and these should have been adjudicated upon by a strong committee of assessors. Once they had agreed upon a sketch design, the successful competitor should be paid a substantial fee, and then he and half-a-dozen other selected architects should be invited to elaborate the design, and work it out in detail. Then we should in all probability have seen a memorial worthy of the occasion."

A similar idea for preliminary sketch designs was expressed by Mr. Leonard Stokes.

"Have an open competition in the first instance," he explained, "confined to sketch schemes, so that the committee can decide whether the memorial shall take the form of a Marble Arch, or a Nelson Column, or an Albert Memorial, or whatever they think the most suitable; and when that is settled then would be the time to select a few men to develop the idea. I confess that, along with others, I was very disappointed when I saw what the committee had done, and I may say, further, I was disappointed in the names they have chosen. It is not necessarily the busiest men who are likely to produce the best design. Personally, I think we want something very dignified and very classical in line, and without saying a word against the five gentlemen selected, I do not think they belong to the strictly classical school."

According to Mr. J. E. Bentley, the architect of the new Westminster Cathedral, the proposed monument requires more of the art of the sculptor than the art of the architect. He inclined to the belief that the work would be better done had one man been selected by the President either of the Royal Academy or of the Royal Institute of British Architects. The Law Courts and the Foreign Office had been selected in competition, and these, he declared, were architectural failures, whereas the new Government buildings about to be erected in Parliament Street and Whitehall were much more successful in design, because one person had been selected to give his best to the work.

At a meeting in Birmingham on Wednesday last a letter was read from the Lord Mayor of London intimating that half-a-million of money would probably be needed for the memorial.

WARD WINDOWS.

By ROBERT W. CARDEN, A.R.I.B.A.

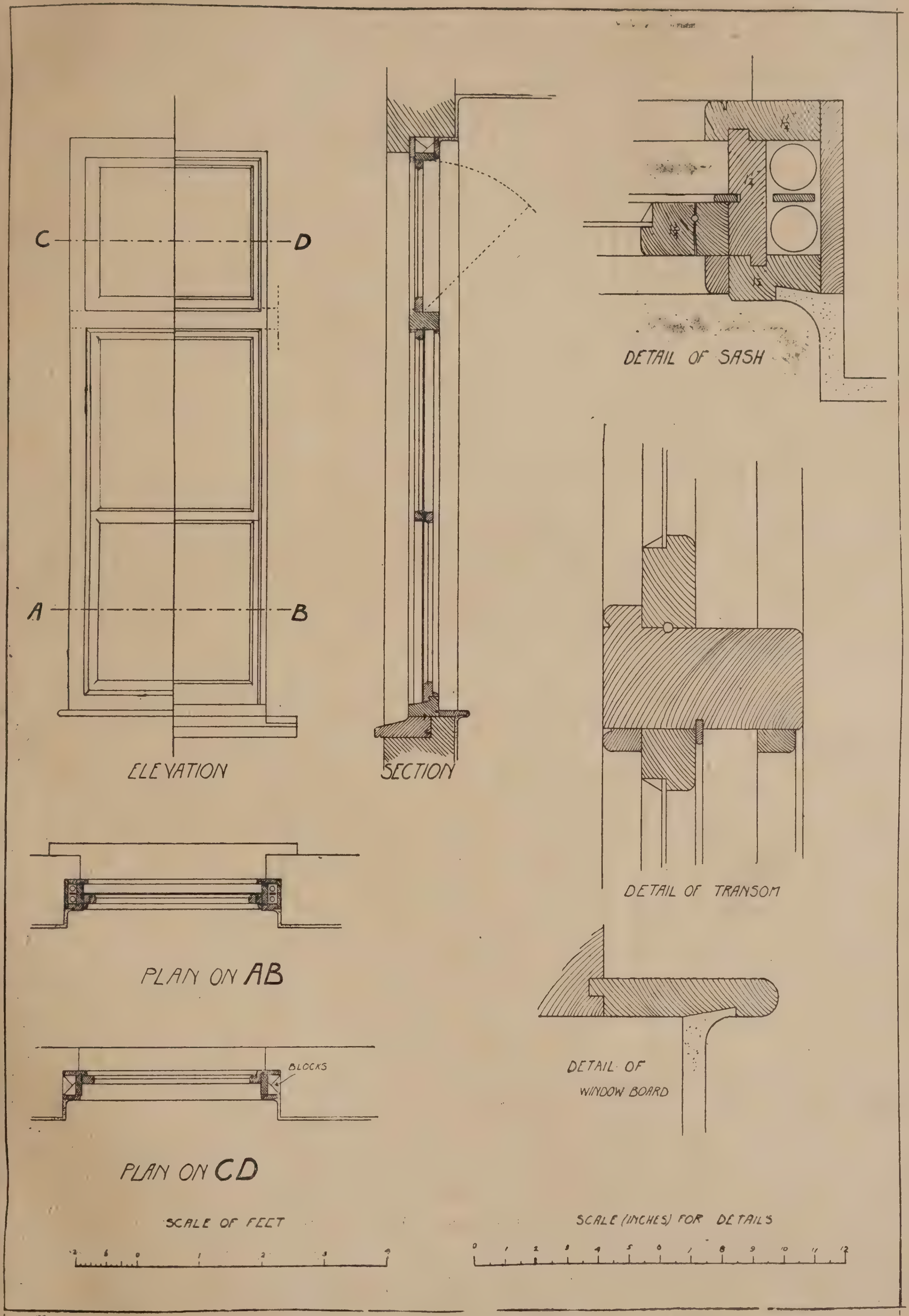
IN the whole range of architectural detail there is scarcely anything so beset on all sides by restrictions as the window of a hospital ward. Greater care in fitting is required than in any other branch of the joiner's work, for while it is necessary, as well as natural, to endeavour to give as refined an appearance as possible, yet there are requirements in the matter of mouldings and enrichments which condemn such details to have a more or less poverty-stricken appearance; while draught and damp have to be more vigorously excluded than anywhere else. It is usual in wards and in their lavatory blocks to round off an angle wherever it may occur: the angles between the floor and the wall and between the ceiling and the wall are carefully curved so that there may be no possible lodgment for dirt and its concomitants, and the angle formed by two adjacent walls is also usually rounded off, though there is not the slightest need to round an external mitre, as there can be no question of its forming a collecting ground for disseminating disease germs.

This principle of "rounding" everything of course applies to windows and all other joinery. But more than that, the window is practically restricted as to its dimensions. If a ward be 13ft. high and the sill be placed 3ft. above the floor-line, the window must be 9ft. high, for it should run as near the ceiling as possible and the remaining foot is required for constructional work. The space between the beds of a medical or surgical ward is usually about 4ft., and this again limits the width to about 3ft. Finally, expert opinion has fixed the type of window that shall be employed, for a double sash hung with a "reversible" patent and a fanlight over is the form usually adopted; and wisely so, for the sashes are easily and quickly cleaned, and the fanlights are of use as an aid to ventilation.

In the window shown by the accompanying illustrations, care has been taken to avoid any mouldings that might be capable of retaining dirt. There is no architrave, and the plaster is worked round to a curve and stopped in a rebate in the lining. The sashes themselves are fitted with the N A.P. patent reversible fittings, and can thus be easily reached for cleaning. The glazing should always be in large sheets, and preferably of plate glass, for with small panes the many sash bars decrease the light, break up what view there may be—and it should be remembered that the outlook is a valued possession to a patient who is condemned to sit or lie back all day and do nothing—and afford a number of extra crannies where disease-bearing particles may collect; they also defy with impunity the dusters and dusting brushes of an army of ward-maids. There must, of course, be four corners in every sash (unless an angle-piece were let in), but there need be no more.

Doors and other fittings for wards and lavatory blocks are to a large extent governed by the same requirements.

A Sinking Library.—The Brunner Free Library and Museum, which were presented to Northwich by Sir John Brunner, M.P., is subsiding owing to brine pumping. The architect, in a report on the matter, states that there is a general subsidence throughout the entire building, and in some places the floors were 12in. lower than at others. He is of opinion that the west wall is dangerous and should be rebuilt on the composite principle. To merely make the building safe will entail a cost of £250, while to place the structure in a fair state of repair will necessitate an expenditure of £450.



WARD WINDOWS. BY ROBERT W. CARDEN, A.R.I.B.A.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Arrangement of Hot-plate.

RIPLEY, DERBY. — AIR SPACE writes: "Please describe an arrangement for a hot iron plate for cooking. I do not quite understand the arrangement of flues and stoke-hole."

An ordinary hot-plate in a large establishment is an iron oven kept hot by steam pipes passing through it, but one for cooking would be a "kitchener" such as every new house in London is fitted with, the size depending upon the circumstances. The Eagle range is one of the best, but of course somewhat expensive; cheaper makes can be obtained by enquiry at the ironmonger's. They are made for either brick flues or iron; the latter are best.

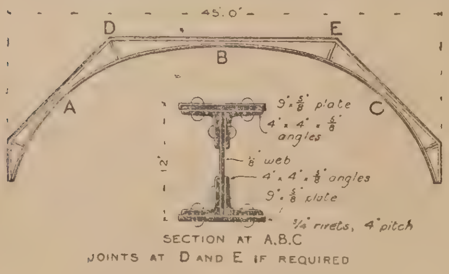
HENRY ADAMS.

Strength of Iron Roof Principal.

CROYDON. — STUDENT writes: "Kindly explain the method of ascertaining the dimensions of the iron principals on enclosed sketch (not reproduced)."

The distance apart of the trusses is not given, but assuming it to be 10ft. or 12ft., the minimum section of wrought iron or steel rib should be as shown in accompanying section, the same section being provided at the top and at the haunches. If the rib is required to be made in pieces for facility of erection the joints should be in the wide part, where the stress is least.

HENRY ADAMS.



IRON ROOF PRINCIPAL.

Books on Plastering, Ironwork and Masonry.

SOUTHPORT.—JOINER writes: "Please recommend a book dealing with plasterer's work, ironwork and masonry, this last giving the names of the various building stones in general use, and their respective qualities."

Millar's "Plastering, Plain and Decorative" (18s. nett.); Adams' "Structural Ironwork" (7s.). We know of no work adequately dealing with both practical masonry and building stones: it would be best to obtain Purchase's "Practical Masonry" (6s.) and Hull's "Building Stones" (7s. 6d. nett). These books can be obtained from Mr. B. T. Batsford, of 94 High Holborn, W.C.

Stone slated Roofs.

BOLTON.—X. Y. Z. writes: "What is the strength of spars necessary to carry stone slates where the purlins are spaced 7ft. apart, centre to centre, and are 15ft. long over part of the building and 12ft. 6in. long over the remainder. The ends of the roof are hipped. Kindly also state sizes of purlins and hips. The outside dimensions of building are 66ft. × 28ft. Is it best to fix stone slates with oak pegs on sawn battens and shoulder up in hair mortar? Is it advisable to board the roof underneath the stone slates?"

A king-post truss may be employed for a roof of 28ft. span, in which case the scantlings of timbers should be somewhat as follows:—Tie beam, 10in. × 4in.; principal rafters, 6in. × 4in.; king-post, 5in. × 4in.; struts, 4in. × 4in.; purlins, 8in. × 4in.; common rafters (or spars), 5in. × 2in. (or 4in. × 3in. if preferred); wall-plate, 5in. × 3in.; pole-plate, 4in. × 4in. Or if a queen-post truss be preferred, the tie-beam should be 9in. × 4in.; principals, 6in. × 4in.; queen-posts, 5in. × 4in.; struts, 4in. × 3in.; straining-piece, 7in. × 4in.; sill-piece, 4in. × 4in; purlins, 7in. × 4in.; spars, 5in. × 2in.; wall-plates, 5in. × 3in.; pole-plates, 4in. × 4in. The purlins at the hips would be the same as in the rest of the building. The best method of fixing stone "slates" is by oak pegs to $1\frac{1}{2}$in. × $\frac{1}{2}$in. sawn oak laths spiked to the spars—if deal laths be employed they should be slightly stouter. For this kind of covering the roof should have a pitch of not less than 45deg., and the "slates" should be laid to a lap of 3in. and "shouldered up" in lime and hair mortar, the tops only of the slates—say 2in. to 3in. from the head—being bedded. Boarding under the slates with $\frac{3}{4}$in. or $\frac{7}{8}$in. rough boards is not much more costly than merely battening, and tends to equalise the temperature of the building and to keep out driving snow.

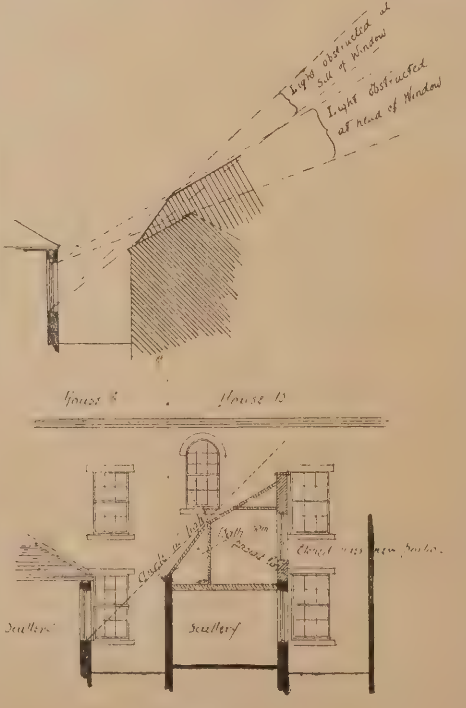
G. S. M.

Ancient Lights.

BRADFORD.—J. J. writes: "I am desirous of erecting a bath-room over the present scullery of the house marked B on the accompanying sketch. At the same time I am anxious not to interfere with the lights of house A. Do you think I would be within my rights if the work were carried out as shown, giving an angle of 45degs. from scullery window?"

Unfortunately the angle of 45degs. has nothing to do with the matter, in spite of the very generally received impression to the contrary. If the dominant-owner's light has been in existence for nineteen years and a day without interference or obstruction, then it is an infringement of right to block up any part of it. In the present instance the loss of light to the scullery which would be occasioned by the new bath-room would be slight and the material assessable damage inconsiderable, having regard to the purposes for which a scullery is used. The top of the scullery would lose much more light than would the floor, and if the upper part required a good light, or if it were a work-room of considerable depth needing to be well lit at the back, a good claim for damages might be maintained. As it is, the window in the back of A's house seems to suffer more than the scullery window, and it would be well to come to terms with A before commencing the additional works rather than to risk the loss of even a farthing damages with the expense and trouble which a lawsuit or arbitration would entail. The accompanying diagram (the top one of the two) shows more clearly what amount of light the new work would deprive A's scullery of, both at top and bottom.

G.A. T. M.


Light obstructed at Sill of Window
Light obstructed at head of Window
House B
House A
Bath Rm
Scullery
Scullery

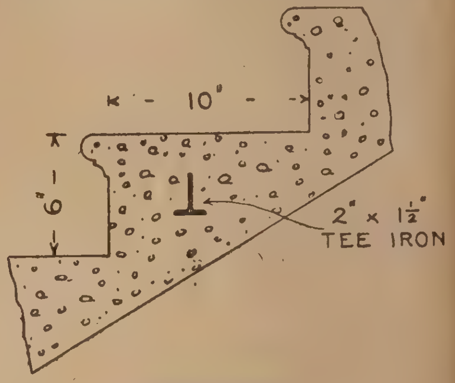
ANCIENT LIGHTS.

Strength of Steps, Joists, &c.

LONDON, W.—DE WET writes: "In constructing a staircase of concrete steps on the cantilever principle, what size iron joist must I put in each concrete step? The steps are 12in. by 6in. by 3ft. 6in. wide, with a 9in. bearing on wall, and are used in a school. Please give a rule for finding size of joists for an ordinary dwelling-house, no ceiling joists being used. What is meant by a fixed girder: does it mean one bolted to template? What is the difference in strength between a riveted girder and a bolted girder (if any)?"

A 2in. × $1\frac{1}{2}$in. T-iron is sufficient to insert in concrete steps, as shown by the accompanying illustration. Although it would be possible to calculate the strength, it is not usual to do so. The common rule for joists is depth in inches = $\frac{1}{2}$ span feet + 2. Example: say 14ft. span, $14 \div 2 = 7$, $7 + 2 = 9$, and thickness = $\frac{1}{3}$ depth; therefore 9 × 3 joists. A fixed girder strictly means one with the ends so built in that the bending down in the centre by the action of a load produces tension in the top flange at each end of span, instead of the usual compression. A riveted girder would always be used where it was necessary to build up from one or more pieces, but occasionally rivets have to be left out for connections, and bolts are used instead to save riveting on the works. These bolts should be a driving fit in the holes and are then practically as good as rivets.

HENRY ADAMS.



CONCRETE STEPS.

How to Become a M.Inst.C.E.

DUNSTON-UPON-TYNE. — PUNGENT ODOUR writes: "Can you state what course of study I must pursue, or to whom I must apply for particulars, in order to become a member of the Institution of Civil Engineers? I hold a certificate for building construction and one of the Sanitary Institute. Will it be necessary to go into the office of a civil engineer, or can I manage it by reading alone?"

All particulars can be obtained from the Secretary, Institution of Civil Engineers, Great George Street, Westminster, S.W.

Chimney Stacks.

LEEDS.—N. W. writes: "In the illustrations to the article on 'Chimney Stacks' in your issue for March 6th, and also in the correspondence referring to it in your issue for March 20th, the majority of the flues are shown 9in. square The building regulations in this city require all smoke flues to be 14in. × 9in. and I shall therefore be glad to know whether in London or any provincial city these flues are allowed 9in. square, as it seems to me that this size is amply sufficient, especially for cottage bedrooms in which fires are seldom made, and being much larger than flue pipes from closed stoves, which have to pass an equal quantity of smoke."

Neither the London Building Act nor the Model By-laws place any restrictions upon the size of flues, with the result that 9in. × 9in. flues are in almost universal use throughout the country, this being the size which is most easily cleansed by the sweep's brush. To build flues 14in. × 9in. is to invite chimney fires, as a considerable amount of soot is generally left behind after sweeping. R. W. C.

Timber Bridge.

London, S.W.—Constant Reader writes: "Kindly give particulars of a wooden bridge for a span of about 50ft., supported on piles driven into the bed of river, to carry a moving load of 10 tons and to have a clear way of 10ft."

It would be necessary to make a survey of the site, and to know the nature of the soil and more about the loading before a design could be submitted. It is a case for a specialist, and the design would be worth $2\frac{1}{2}$ per cent. on the cost of the work. It might have to be timber only, or timber and iron according to circumstances. Also the construction would vary if in this country or abroad, where only native labour could be obtained. The span is mentioned as 50ft., with piles in centre, leaving it uncertain whether there are two spans of 50ft. or two of 25ft. HENRY ADAMS.

Makers of Fireproof Theatre Curtains.

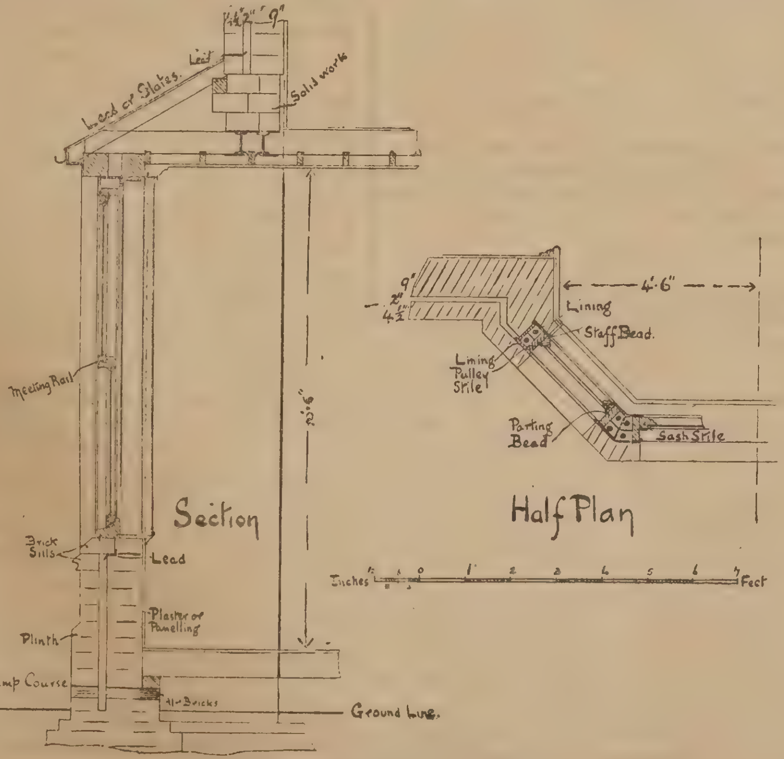
Taunton.—X. Y. Z. writes: "Kindly mention the names of makers of asbestos fire-resisting curtains and doors for theatres and public halls. Please also name a good book showing details of the construction of the stage."

The fire-curtains at Drury Lane, Covent Garden, and many other theatres are by Messrs. Merryweather, Bow Street, W.C. "Stage Construction," by Edwin O. Sachs, is the book on this subject to obtain. It is published by B. T. Batsford, 94 High Holborn, W.C.

Bay Window with Hollow Walls.

Birmingham.—J. T. C. writes: "Kindly give a plan and section of a bay window in 14in. cavity walls, with sash windows, and also the proper thickness of sash to take $\frac{1}{4}$in. plate glass, and other particulars."

It is difficult without large scale drawings to give all the details, but the general arrangement of a bay window 9ft. wide by 3ft. deep may be gathered from the accompanying sketches. The usual dimensions of the various members are somewhat as follows:—3in. (oak) sills, sun-weathered, throated and grooved. $1\frac{1}{4}$in. or $1\frac{1}{2}$in. grooved pulley stiles and heads, all tongued to 1in. grooved linings (inside and outside); $\frac{1}{2}$in. back linings; $\frac{3}{8}$in. (oak) parting beads; $\frac{5}{8}$in. × 1in. staff beads; $\frac{1}{4}$in. parting slips; 2in. brass axle pulleys; 2in. rebated and moulded sashes, with $1\frac{3}{4}$in. meeting rails, bevelled and rebated. As in this case it is proposed to use $\frac{1}{4}$in. plate glass, the thickness of the sashes may be increased to $2\frac{1}{4}$in. In order that the upper floor joists may rest on the top of the composite iron beam, and not on its lower flanges (as shown), it is very usual to fix that beam (often of 9in. × 3in. deals, bolted together) lower down, and to cover it with a wooden casing. The top of the bay in such case is usually wood panelled. G. S. M.



BAY WINDOW WITH HOLLOW WALLS.

Surveyors' Fees for Adjusting Extras and Omissions.

Leicester.—C. L. W. writes: "How are surveyors paid for adjusting extras and omissions at the completion of a building contract? Is it usual for the builder to pay—upon receiving a certificate from the architect—at the expense of the proprietor? Is his fee included in the final 'bill of adjustments'?"

Surveyors' fees for adjusting omissions and extras are charged for according to time occupied, as a rule, rather than by commission, and the account should preferably be delivered direct to the building owner, or to him through the architect. Many surveyors, however, adopt the practice of including their fee in the final "bill," when it is again included by the architect in his final certificate, and the surveyor is paid by the builder, this being perhaps the best thing to do if the builder has paid for the original quantities. The question is really one of advisability, to be determined in each case on its own merits.

G. A. T. M.

Ball-room Floor.

Hexham.—Morpeth writes: "Referring to the reply on page 104 of your issue for March 13th, is it necessary to provide for spring on a ball-room floor? I am busy with a similar job, and have specified 5in. by 2in. joists to be laid 3in. deep in 6in. of concrete, with $1\frac{1}{2}$in. pitch-pine deals in 4in. widths. Would it be better to put the joists on dwarf walls? The hall is 50ft. by 30ft. In dealing with the two floors, would it be good construction to put five rolled joists between and build a $4\frac{1}{2}$in. wall on them to divide rooms and carry floor above, using bond timber every 3ft.?"

It is generally considered desirable that a ball-room floor should have a certain amount of spring in it; a solid floor not only gives a sensation of deadness but is apt to be very cold, if not damp. The floor would probably give more satisfaction if carried on dwarf walls. The upper floors may be carried as suggested, but, instead of bond timbers in brickwork, ordinary brick-nogged partitions should be used. HENRY ADAMS.

Measuring Buildings.

London, W.C.—A. B. C. writes: "I intend to sketch and measure some old buildings, and should be glad to have some information on the subject. Are there any books dealing with it?"

Measured drawings should be done on the spot only. A large-sized sketch-book may be useful for making notes, but as the drawings will require to be made to a fairly large scale and the profiles of mouldings taken full-size separate sheets of paper are best. A useful scale for the drawings is $\frac{1}{8}$th. In order to give you a clear notion of how to proceed we will suppose you are going to measure a church consisting of nave, aisles, and chancel. First accurately plot the nave piers, then take a centre axial line right down the centre, and from certain points, marked on the floor in chalk, take cross diagonal measurements to the principal features of the side walls, such as piers, windows, &c. If possible, continue the centre axial line through the wall into the churchyard, and thus form a connecting link with the second operation of setting out the exterior. To do this, stake out a rectilinear figure outside the church, and measure the offsets to buttresses, porch, &c. The thickness of walls can, of course, only be accurately determined where a window or doorway occurs; to make an absolutely accurate plan the thickness will have to be obtained at a great many points, and it is better to do so wherever possible. If there is any stone vaulting or roof work to be planned, procure a lead pointer, and, having chalked the point, suspend it from the centre of the boss, rib, or whatever part of the roof you desire to plot, until it touches the floor of the church, when you will be able to accurately plot the chalk mark on the plan. In measuring stone vaulting it is best to thus draw out in chalk a plan of the vault above on the pavement below. The plan of the building having been prepared, the line of heights should then be drawn to the scale of the plan. As the level generally varies considerably in old buildings, a good plan is to mark a chalk line round the building with a straight-edge and spirit-level. Take measurements up and down from this line. To obtain the shape of mouldings a strip of lead about $\frac{3}{8}$in. wide should be pressed carefully into the curves and hollows; then lay the strip on a sheet of paper, and follow the shape of it with a pencil. The mouldings can be filled in to scale on the drawings afterwards. Sketches plotted to scale should not be touched again, as re-drawing destroys all their life. On measured drawings nothing should be shown that has not been measured, not even the joints of stonework; if you want to show rubble, measure a small area carefully and draw that. There is often a beauty of plan in buildings which is hidden unless surveyed and plotted; a simple and rapid method of obtaining a small-scale plan of a large building is to use scale-divided paper and pace carefully the building, adopting, supposing the squares are $\frac{1}{8}$in. square, a scale of one, two or three paces to an eighth of an inch, giving approximately 24ft., 48ft. and 72ft. to an inch respectively. In studying an old building make a point of endeavouring to find the reason for everything—study its anatomy, as it were. This will be found invaluable in designing; for if you have a reason for everything you do, your work will always be interesting. It should be remembered that old buildings belong to the racial art of architecture, having been produced by co-operative workmanship, by men who had their art handed down from their forefathers, so that the buildings are instinctively and naturally a reflex of the social condition of the people. The following books contain measured drawings: "The Abbey Square Sketch Book" (3 vols., £3 nett each), "Churches of the Nene Valley, Northamptonshire" (£2 4s.), and "The Architectural Association Sketch Book" (several volumes). These can be obtained from Mr. B. T. Batsford, of 94 High Holborn, W.C.

Instructions in Manual Training.

LITTLEHAMPTON. — HERCULES writes: "What qualifications are necessary for the position of 'Instructor in Manual Labour' in a Board school?"

Under the London School Board, instructors and assistant instructors in manual training (woodwork) are required to have passed in the first class in science subject No. 1, of the Science and Art Department (practical plane and solid geometry), and to have obtained the full "D" certificate or an equivalent thereof, namely, science subject No. 2 (machine construction and drawing), or science subject No. 3 (building construction), or a certificate in some kindred subject from the City and Guilds of London Institute. If any persons are appointed who have not these qualifications, they are required to obtain them, and are not allowed any increase of salary till they have obtained them. They must also have an adequate certificate of competency to teach woodwork; the certificate of the City and Guilds of London Institute or a certificate in Sloyd being accepted. Assistant instructors receive a salary of £80 per annum, rising by £5 annually to a maximum of £100 per annum; while instructors commence at £100 per annum and rise by £5 annually to a maximum of £155 per annum. This is for 27½ hours per week, some of which may be in the evening, though instructors may be required to teach woodwork for two additional evenings per week, being paid 4s. per evening for two hours' instruction for this extra work. No other evening work than that which is provided by the Board may be undertaken without the knowledge and consent of the School Management Committee. Assistants may be called upon to take sole charge of a manual training centre and vacancies in the number of instructors may be (but not necessarily are) filled by the promotion of assistants, if qualified and reported to be good in class management. Persons appointed may be required to attend classes for further instructing themselves at the discretion of the School Management Committee. These regulations, it should be noted, apply to London only, other School Boards having regulations differing more or less according to local circumstances and requirements. G. A. T. M.

Dividing Land into Plots.

BARNSLEY.—CHAIN writes: "The plot of land shown in the enclosed sketch (not reproduced) is to be divided up into plots of 400 sq. yds. each for allotment gardens; two 10ft. roadways also to be provided. Which is the best way to set about this? Is there any rule applicable to such a case?"

There is no rule applicable to such a case as this. The only method is to set it out by trial.

HENRY ADAMS.

Leaning's Specifications.

ILKLEY.—F. C. R. F. writes: "Can you tell me where I can get a new or secondhand copy of Leaning's 'Specifications,' published originally at 4s., but now out of print?"

We cannot tell querist where he can obtain Mr. Leaning's book on "Building Specifications" issued at 4s. and now out of print. Mr. B. T. Batsford, of 94 High Holborn, W.C., is, however, just issuing "Building Specifications," by John Leaning, price 18s. nett, a review of which is in hand and will shortly be published in our columns.

Liability to Repair House.

BEWDLEY.—C. J. W. writes: "I became the tenant of a house in 1862. Can I be called upon to repair certain cracks which have appeared? They have been caused by a sinking."

Your liability to repair depends upon the terms of your lease. But if you are a tenant from year to year you are not liable to repair the cracks if this should involve rebuilding.

A. O. H.

FIXING ELECTRIC BELLS IN HOUSES.*

BY H. E. NEALE.

AT the present time electric bells are fitted in almost every house or place of business, and the telephone is superseding the old system of speaking tubes, so that a few words about their construction and application may be of interest.

The Léclanché Cell.

The first thing that we must direct our attention to is the battery, the Léclanché form, or a modification of it, being that most used for bell and indicator work. This cell consists of a glass outer jar in which is placed an amalgamated zinc forming the positive element, the negative element consisting of a carbon plate placed inside a porous pot closely packed with a mixture of carbon and peroxide of manganese, the top of the porous pot being run in with melted pitch. The Léclanché is a single-fluid cell, the porous pot not serving to keep the fluids separate but merely to contain the broken carbon and manganese and keep it in immediate contact with the carbon plate. The exciting fluid is a solution of sal-ammoniac (chloride of ammonia). On closing a circuit the sal-ammoniac is decomposed and the chloride attacking the zinc forms chloride of zinc, which is soluble in the surrounding liquid, while the ammonia developing at the surface of the carbon forms a soluble compound with the oxygen, which it extracts from the manganese. While the cell is at work the zinc is consumed, and the chloride of zinc accumulates in the solution, the carbon remaining unaltered. The peroxide of manganese loses some of its oxygen; but after a time the supply of oxygen becomes reduced, and the hydrogen accumulates on the surface of the carbon plate, producing polarisation. Now if the circuit is broken and the cell left to rest for a time it will depolarise, the peroxide of manganese absorbing oxygen from the air.

Dry Cells.

The next cell most common in use is the dry cell. I will give a short description of an E.C.C. cell, made by the Electrical Construction Company. It consists of a carbon plate, which forms the positive pole, surrounded by manganese dioxide; outside this is a coat of lime and sal-ammoniac, and the whole is contained within a zinc case which forms the negative pole of the battery. At the bottom of the zinc case is another case of insulating material. A small piece of cotton is placed on the top of the manganese dioxide, and a piece of glass tube fixed in the top as a waste tube; the whole is run in with pitch. The advantage of the dry cell over the ordinary wet cell is that it is much cleaner, does not freeze, takes up less room, can be placed in any position, and has no solution to evaporate; it, however, has not such a long life, and the E.M.F. is not so great as in the various types of the Léclanché.

Bells.

Next we have the bell, which may be either single stroke, trembling, or continuous action. The construction is much the same in all three, with the exception of the connections.

The trembling bell is that most used. It consists of an electro-magnet firmly fixed to an iron frame and provided with a soft-iron vibrating armature, one end of which is fitted with a hammer, while the other is fixed to the iron frame by a spring having a platinum contact-piece; insulated from the frame is a contact post fitted with an adjustable platinum-pointed screw and a tightening screw.

The action of the bell is as follows:—The current entering at the terminal flows through the coils of the electro-magnets into the frame, through the spring and armature to the platinum-pointed screw, to the contact post, and thence through to the other terminal, but in flowing through the electro-magnets the current has magnetised the core, which now attracts the armature, causing it to move up against the poles and bringing the hammer against the gong; at the same time contact is broken with the contact post, and as the cores of the electro-magnets are made of soft iron they at once lose practically all their magnetism, so that the armature in obedience to the spring moves back to its former position. This action is repeated as long as the button of the push is kept in.

Of pushes there are many forms, but the principle is the same in all, the object being to join the circuit, which is kept apart by some form of spring.

Wiring.

Last, but not least, comes the wire. That used for bells should never be less than No. 20 gauge (No. 18 is preferable), and it should be tinned to prevent corrosion, insulated by at least one coat of pure rubber, and double cotton-covered and served with paraffin wax.

In wiring a building for bells it is first necessary to ascertain where they are to be fixed, the position of the pushes, and the situation of the battery.

In an ordinary house the most usual place for the bell is in the kitchen. An indicator is placed in the circuit, and shows at a glance which push has been used. There are several forms of indicators—the swinging pendulum, the mechanical replacement, and the electrical replacement. In good work all bell wires are drawn through zinc tubing to protect them from the effects of the acids in mortar and cement. While we are at this stage, mention may be made of one or two important things that a clerk of works should insist on—namely, the whole of the wire to have a coating of pure rubber underneath the cotton covering, the wires to be fixed in such places that they cannot become injured or damp, and every wire to be so fixed that it can be drawn out, and another drawn in to replace it if necessary, without disturbing the decorations or structure.

Electrical Units.

Returning to the batteries, the E.M.F. or pressure is termed voltage, the quantity of current is expressed in ampères, and the resistance through which the current passes is measured in ohms: therefore, $C=\frac{E}{R}$ which means that if we divide the resistance of the circuit in ohms into the E.M.F. in volts at which the current is supplied, the product will give the current's strength in ampères. Similarly, if we know the value of any two of the three quantities by the application of the formula, the third can at once be found, for it is obvious that the equation $C=\frac{E}{R}$ may be written $R=\frac{C}{E}$, or $E=C\times R$. Thus from Ohm's law we see that 1 ampère of current in a circuit having 1 ohm resistance requires an E.M.F of 1 volt. If we increase the E.M.F. to 2 volts without altering the resistance of the circuit we get 2 ampères. If we still further increase the E.M.F. to 4 volts we get 4 ampères of current. Similarly, if keeping the E.M.F. to 1 volt, as in the first instance, we reduce the resistance to ½ ohm, we get a current of 2 ampères, and if we still reduce the resistance to ¼ ohm we get 4 ampères.

If we wish to know what current we shall get in a circuit we proceed thus:—We first find the resistance of our circuit, which we will presume to be 4 ohms, and our batteries to produce 6 volts. Now, with the formula $C=\frac{E}{R}$ we get $C=\frac{6}{4}$; therefore, $\dfrac{4)\,6}{1\frac{1}{2}}$ ampères. Again, if we know that our current flowing is 1½ ampères, and the E.M.F. is 6 volts, what is the resistance of the circuit? Now, $R=\frac{E}{C}$, i.e., $R\ \frac{6}{1\frac{1}{2}} = \dfrac{1\frac{1}{2})\,6}{4} = 4$ ohms.

Again, we know the current and resistance, we want to find the E.M.F. or voltage: $E=C\times R$; C is $1\frac{1}{2}$; R is 4; therefore, $E=1\frac{1}{2}\times 4=6$ volts.

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* Part of a paper read before the College of Masons on January 29th, 1901.

LONDON COUNTY COUNCIL.

THE TOTTENHAM HOUSING SCHEME.

AT last week's meeting of the London County Council the adjourned report of the Housing of the Working Classes Committee as to the Lordship Lane estate, Tottenham, for working men's dwellings came up for discussion.

Mr. Waterlow, the chairman of the committee, moved that the estimate of £91,500 be approved, and that the Council should acquire about 225 acres of land at Tottenham, Wood Green, and Edmonton, known as the Lordship Lane estate, at £400 per acre. He said that this was the largest scheme which had ever been brought before the Council, but there was no need for him to dwell on the necessity of some great proposal of the sort. They had now to consider simply whether they would buy the land or not, because all the details as to building the cottages and rents would come before the Council at a later period. The situation of the land was about as favourable as any site of the size which could be obtained. Their architect reported that he could build 5,779 cottages on the site, to accommodate approximately 42,000 persons. The scheme had been for some time before the public, and so far as he knew only three objections had been raised against it. The first was that they were interfering with private enterprise, secondly that the rents would be too high, and thirdly objections were put forward on financial grounds. As to the first objection, he had only to point to the Noel Park estate, not far from the site they proposed to purchase. That estate had been very successfully developed by the company which owned it, but in spite of that success the company had taken no steps to extend it. As to rents, they, of course, depended on the cost of building, and if the cost of building could be reduced the rents could also be reduced. They proposed several sorts of cottages at different rents, from 6s. a week to 10s. 6d., each cottage to have its own garden—so as to be able to let the houses at a rent of a little over 2s. a room. As to finance, the architect had assured them that they could not build cheaper, and if the Council could not make the scheme pay while buying at £400 per acre it would only be through mismanagement.

The Amendment.

The Hon. W. R. W. Peel, M.P., moved to add as an amendment the following words to the recommendation:—"On the clear understanding that if the Council itself proceeded to build, the cottages should be so constructed that the rent demanded should be within the reach of classes earning less than 30s. a week." He said they were bringing forward schemes for housing people who did not require such accommodation, and they were neglecting those unfortunate persons who did require housing, and whom they were turning out of their present homes by their improvement schemes. It was quite impossible for persons receiving less than 30s. a week to pay the proposed rents, and the cottages they were going to build would be taken by artisans earning good wages.

Mr. A. J. Williams, in seconding the amendment, said that in the Boundary Street area 7,500 persons were dishoused, and of these only 11 were offered accommodation at rents which they could pay. The Council had thus shown itself backward in dealing with the housing of the poor. It was said that the Council was placed under disabilities as compared with private companies, but he thought that they had better show the same persistence in getting what they wanted from the Government as they did in respect to other matters, perhaps not quite so worthy of that persistence.

Mr. Steadman, while supporting the scheme, pointed out that it would take eight or ten years to complete, and by that time the population would be increased by four hundred thousands.

Alderman Beachcroft believed that what they had to consider was whether or not this scheme was likely to solve the housing problem. He had doubts about it. Within two years they had bought great estates to accommodate 5,000 to 8,000 people, and the work on them had not yet commenced.

Mr. J. Burns, M.P., said this scheme was five times larger than the Shaftesbury estate at Battersea for labourers, and that estate paid a handsome dividend, with the annual loss of less than 1*d.* per cent. on their capital. Park Lane and Bayswater could not say that. The houses were never empty. In this scheme, as the Council did not want any dividend, they ought to do better. He did not believe in charity rents, but their proposed rents would be 50 per cent. better than on slum property in Stepney and Mile End. Until they got fair rent courts in East London this was the most important contribution to the great housing problem. The Council were "grasping the nettle."

On a division the amendment was rejected by 82 votes to 21, and the recommendation of the committee was then adopted.

Strand Improvement.

On the recommendation of the Improvement Committee it was agreed "that the working drawings, &c., and estimate of cost (£6,294) of the paving and other works in the Strand near the churches of St. Clement Danes and of St. Mary-le-Strand be referred to the works manager, with a view to the work being carried out without the intervention of a contractor, it being understood that the work around St. Clement Danes Church shall be proceeded with by night as well as by day." With reference to Carr's Restaurant, the members reported that they had been unable to approve of the first plans submitted by the owner of the restaurant, and invited him to submit an amended elevation on the basis of an English Classical design. This had been done, and they now recommended the Council to approve of the new designs. This was done.

AIR IN ROOMS WARMED BY GAS FIRES.

By THOMAS FLETCHER, F.C.S.

THE complaint as to the dryness of the air in rooms warmed by gas fires is constantly making its appearance, and, with the object of finally deciding the matter, I have been making careful experiments for some time, in such a form that they can be repeated and verified by any observer.

The hygrometer used is the ordinary Mason's pattern, a wet and dry bulb thermometer, mounted side by side; these can be obtained from any instrument dealer or chemist.

The calculation of the percentage of moisture from the difference shown by the two thermometers is not simple enough for general use, but a good rough rule sufficient for ordinary purposes, between the temperature of 45deg. and 65°, is to take the difference in degrees between the two thermometers, multiply this by six, and deduct the product from 100; the result will give the percentage of moisture, taking complete saturation as 100. This is perfectly reliable for comparative observations between the effect of gas and coal fires at the same temperatures, and exact calculations are unnecessary.

The room in which the gas fires and stoves were tested is my own bedroom, 24ft. by 16ft., with two large windows, and the days selected were dull and wet, the outside air being completely saturated with moisture. The coal fire was in a well-ventilated sitting-room of the same size.

Room Warmed by an Incandescent Gas Fire.

	Time.	Dry bulb.	Wet bulb.	Moisture.
No fire, window shut ..	11 a.m.	50°	46°	76 per cent.
No fire, window open ..	3 p.m.	50·5°	48°	85 „
Fire full on for 1½ hours, window shut	11 p.m.	56°	51°	70 „
Fire low for 8 hours ..	7 a.m.	54°	49·5°	73 „

Outside temperature, 11 a.m., 46°; 3 p.m., 46°; 11 p.m., 43°; 7 a.m., 43°.

Room Warmed by Coal Fire.

The temperatures in this room were so constantly varying from 55deg. to 65deg. that no series of correct observations was possible, but the greatest difference at any time between the wet and dry bulb, during the time the fire was burning, was 6deg., and the average 5deg., showing 70 per cent. of moisture, precisely the same as with a gas fire. Of course, in making these experiments, the thermometers must not be exposed to any direct radiant heat from the fire.

Rooms Warmed by Incandescent Gas Fire with Warm-Air Arrangement.

The fire used was the same as in the previous tests, with an air-warming arrangement added. This had 4 square feet of heating surface, the temperature of which was well below 212deg. to prevent charring the dust in the air, and consequent smell. The increase of heating power with this was 16 per cent., and the moisture in the air was not affected, a fact clearly shown by the figures. This, of course, is very small and of a low power for a warm-air arrangement, but it is as powerful as can be comfortably used in a living room where the occupants are at rest; when the outside air is comparatively dry, any dryness in the outer air is added to that produced in a warm room, and on dry days a larger air-warming and drying power would be unpleasant. In rooms where the occupants are in motion, a much more powerful air-warming arrangement can be used with comfort, and is, in fact, desirable for economical reasons.

Incandescent fire with warm-air arrangement:

	Time.	Dry bulb.	Wet bulb.	Moisture.
No fire, window shut ..	11 a.m.	48°	45°	82 per cent.
No fire, window open ..	3 p.m.	49°	46°	82 „
Fire full on for 1½ hours, window shut	11 p.m.	58°	53°	70 „
Fire low for 8 hours ..	7 a.m.	56°	51°	70 „

Outside Temperature .. 11 a.m., 47°; 3 p.m., 48°
Outside Temperature .. 11 p.m., 44°; 7 a.m., 42°.

The tests with the incandescent gas fire with warm-air arrangement could not be compared with a coal or coke fire stove, as we have none in use under similar conditions, but an attempt was made in a boiler house connected with the plant houses. This is warmed by the diffused heat from the surface of a self-contained vertical boiler, and with an external temperature of 44deg., the air being saturated with moisture, the temperature ranged from 59deg. to 60deg., and the moisture from 50 per cent. to 64 per cent. This variation in the moisture at the same temperature can be accounted for and reproduced at will, but it has no bearing on the present subject, and, therefore, need not be dealt with further.

Flueless Gas-stoves.

As these are largely used in rooms which are not properly ventilated, it is desirable that they should be included in the series of experiments. During the combustion of 30 cubic feet of gas about one pint of water is formed, and this would all be condensed on the walls and windows, but for the fact that the rise in temperature caused by the combustion increases the proportion of moisture the air will absorb without saturation, but in the absence of ventilation, when the gas is extinguished and the temperature falls, this extra moisture is condensed on the walls, windows and contents of the room, and, therefore, it is impossible to dry a room under ordinary conditions by the use of any flueless gas stove.

Tests made in a room without ventilation, 10ft. 3in. by 18ft. 6in. by 12ft. 3in. high; cubic area about 2,100ft.; gas consumption, 14 cubic ft. per hour. Area of glass in windows, 50 square feet.

Outside temperature, freezing.

	Dry bulb.	Wet bulb.	Moisture.
Before lighting ..	43·5° ..	39° ..	73 per cent.
After 1 hour ..	52° ..	47·5° ..	73 „
„ 2 hours ..	5 ° ..	57° ..	70 „
„ 3½ hours ..	60° ..	53° ..	58 „

The want of ventilation was very appreciable, the room feeling hot and close.

Repetition of the above with door open 2in. Outside temperature, 42deg.

	Dry bulb.	Wet bulb.	Moisture.
Before lighting ...	50° ..	46° ...	76 per cent.
After 1 hour ..	58° ..	53° ..	70 „
„ 2 hours ..	61° ..	55° ..	64 „
„ 3½ hours ...	65° ..	57° ..	52 „

Opening the door wide for one hour caused a drop in the temperature of 12deg. in both wet and dry bulb thermometers. In both the tests with flueless stoves the moisture condensed on the windows and walls was distinctly acid to test papers, showing the presence of sulphur in the products of combustion.

To prove that the so-called feeling of dryness caused by gas fires with flues had another source, which I have always suspected, the sheet-iron flue elbow was removed, allowing a small quantity of the products of combustion to escape into the room. The unpleasant feeling of dryness in the throat and nostrils was soon appreciable, and this is evidently caused by a trace of sulphur in the products of combustion escaping, a fact easily proved by the reddening of a strip of wet blue litmus paper, showing that the alleged fault of gas fires is caused entirely by defective flues.

The same result as regards the presence of sulphur compounds on thick damp days, or in fogs, will be found in the open air in London. Litmus paper becomes red when it touches the moisture on walls and windows, or the mud in the streets; it is acted on by the air in railway tunnels; the whole atmosphere of London in damp weather has a strong acid reaction; in fact, in November I was unable to obtain in London any blue litmus paper, although kept in corked bottles, which had not been more or less acted on by the sulphuric acid present in the air. Most of this acid is, of course, produced by the combustion of coal.

In an inhabited room, from 58 per cent. to 72 per cent. of moisture, shown by a difference of 6deg. to 8deg. between the wet and dry bulb thermometers in a room about 62deg. Fahr., will be pleasant, and this is easily obtained with either a coal or an incandescent gas fire, except when the outer air is completely saturated with moisture. A transient gleam of winter sunshine, without appreciably altering the actual temperature of a room, at once lowers the wet bulb thermometer, and by reducing the proportionate excess of free moisture, causes a pleasant feeling of warmth, although this warmth, as shown by an ordinary thermometer, has no real existence. This explains the fact that the feeling of comfort and warmth depends rather on the amount of moisture in the air than on the actual temperature as shown by a thermometer, a point to which sufficient attention has not been given in the management of sick-rooms and hospitals.

There is no doubt whatever that any room showing a temperature of 65deg. by an ordinary thermometer can be made to feel hot and close, comfortable or chilly, by variations in the conditions as regards moisture, ventilation, radiant heat, &c., and that the feelings are a much more reliable guide than a thermometer.

In the printed instructions for the use of Mason's hygrometer it is stated that an "artificial locality may be produced by very simple means, and those whose circumstances prevent them from seeking a climate suitable for their peculiar constitution can to a great extent obviate the necessity by the use of this instrument."

I trust that the very simple rule given above for reading and calculating the indications will prove of service to many invalids who are unable to select a suitable climate, and it must be borne in mind that the necessary conditions can only be produced with certainty by a gas fire with or without air-warming arrangement as required. Coal fires and stoves are much too irregular in their results to be reliable, although, where gas is not available, approximate results may be obtained with careful management. A coal fire alone will not meet all cases; a steamer to moisten the air is often used when it is already nearly saturated and the reverse effect is really required. An additional means of controlling the percentage of humidity is necessary, and this would possibly be done best by an oil stove with a flue to remove all the products of combustion, which are quite out of the question in a sick-room.

London Electric Tramway Extensions.—The new electric tramway between Hammersmith, Kew Bridge and Acton was informally opened last Wednesday. The central power station and machine shops are at Chiswick, and the hundred cars placed on the road have been made and completely equipped at these works.

Masters and Men.

The Bury Painters have Struck to the number of about 120 men. The masters have conceded an advance of wages and a reduction of hours, and the point of difference has reference to the alteration of the date of notices.

The Yarmouth Carpenters and Bricklayers have struck for an advance of wages from 7d. to 8d. per hour. The painters and plumbers had also been restless, but the former have decided to stick to their work, and an arrangement has been made with the plumbers.

The Carpenters and Joiners in Dudley and District have struck work in consequence of the employers calling upon them to submit to a reduction in wages of from 8$\frac{1}{2}$*d.* to 8*d.* an hour. The employers state they are compelled to enforce the reduction owing to the depressed state of trade.

The Perth Joiners have Struck Work.—Some months ago the masters intimated that they intended to reduce the wages from 8$\frac{1}{2}$d. to 7$\frac{1}{2}$d. per hour. The men wrote that they could not agree to the reduction, but no notice was taken of their reply till the end of last week, when a number of employers offered 8d. an hour. Seven masters have agreed to go on at the old rate of wages, but the men employed by the six firms who insisted on the reduction have struck. About 70 men are out.

The Irish Building Trade Dispute.—Owing to the extension of the Belfast building trade dispute to Dublin and the operations of the Employers' Association in the Irish metropolis, the Belfast executive of the Amalgamated Carpenters' and Joiners' Association threaten to bring out every man belonging to their trade union in both cities. The Belfast secretary states that the strikers are receiving most satisfactory financial support, not only from the headquarters in Manchester, but from other trade societies, and there is still a fund of £270,000 to fall back upon.

The Coventry Building Trade Dispute has been settled. Mr. A. A. Hudson, barrister-at-law, who was appointed by the Board of Trade to act in the building trade dispute at Coventry between employers and operatives, sat last week. Notice had been given by the Master Builders' Association of a reduction of $\frac{3}{4}$d. per hour for bricklayers (from 8$\frac{3}{4}$d.), painters by $\frac{1}{2}$d. (from 8d.), and labourers by $\frac{1}{2}$d. (from 6d.), and shorter hours during the two midwinter months. The employers' contention was that present rates of pay were based on a period of activity in business which has been unknown for four years past, and that this fact, coupled with the general trade conditions of the country, justified the proposed reductions. The carpenters, joiners, plumbers, and painters agreed to arbitrate, but not the bricklayers and labourers, who were consequently locked out. Mr. Hudson found that the notice given was bad, being delivered a day too late, and therefore the existing rules would stand.

Law Cases.

A Difference about the Cost of 133 Houses.—At the Birmingham Assizes in August last an action was tried by Mr. Justice Wills, in which George Crouch, builder, of Hockley, sought to recover from William Roberts, estate agent, the cost of 133 houses erected by the plaintiff at Selly Oak. The jury found for the plaintiff, and the case was referred to arbitration so that the cost might be ascertained. Mr. L. Morton Brown, barrister, was appointed the referee, and he held several sittings in Birmingham. Messrs. Arnold Harris and G. Kenwrick, surveyors, called by the plaintiff, estimated the cost of the houses at £24,642, whilst the defendant's surveyors, Messrs. A. Edward and S. J. Holliday, estimated the cost at £14,228. The referee has now given his award, allowing £20,575 9s. as the cost of the houses. To that sum is added £1,125 awarded for profit, &c., and after crediting payments already made, &c., there remains a balance due to the plaintiff of £6,231 9s.

Keystones.

Bristol Police Courts Competition.—Mr. Henry Williams has won the first premium of £100 for designs for the extension of the Bristol Police Courts. The competitive plans—17 in number—were sent in early in February. The Finance Committee selected five for consideration. The second premium of £50 goes to Messrs. Buckland and Farmer, of Birmingham; and the three other selected designs were by Messrs. Holbrow and Sons, Mr. E. C. Hanson, and Messrs. La Trobe and Weston—all of Bristol. The successful plan provides for two new courts—one a large room.

At Brixton Congregational Church a new chancel has been built as a memorial to Sir Henry Tate, the founder of the National Gallery of British Art and of many Free Libraries in South London. The chancel is in the form of a large bay, and takes the place of a small structure which formerly was occupied by the organ. The style is described as Classic. Leading features of the new work, for which Mr. P. Morley Horder was architect, are a handsome pulpit, rood screen, organ lofts—one at each side—and rich wood panelling round the lower part of the wall. Five lancet windows of stained glass are the only parts of the old chancel which have been put into the new one.

A new Infectious Hospital at Chickenley Wood, Dewsbury, is being erected. The scheme comprises an administrative block containing two drawing, dining, and doctor's apartments, dispensary, bedrooms, two bath-rooms, lavatories, and store rooms. Two fever pavilions, each 150ft. by 30ft., are being provided, and one has already been roofed. The other is not so far advanced. There will be accommodation in each for twenty-two beds, with a nurses' room in the centre, cutting off the male from the female wards, and to each pavilion is being added a separate ward for special cases. An isolation block for four beds, with laundry, wash-house, lodge, and offices will be constructed later. Accommodation is being provided for forty-eight beds, and the newest appliances as regards ventilation, steam-heating and electric lighting will be adopted. It is proposed to treat scarlet fever, typhoid fever, and diphtheria. The contractors are Mr. John Pickersgill, Ossett, mason; Messrs. A. and S. Wheater, Leeds, for the concreting and plastering; Mr. George Hargreaves, slater; Mr. Frank Newsome, plumber; Messrs. E. Chadwick and Sons, joiners; Mr. F. Firth, ironwork; Messrs. C. Kite and Co., London, ventilators. Mr. G. A. Fox is the architect.

New Business Premises at Newcastle.—The "Kingo Works" of Messrs. Davison and Pickering, Limited, 13 to 17 Stowell Street, Newcastle, have recently been opened. The site covers an area of over 800 sq. yds. The block of warehouses has a main frontage to Stowell Street being 72ft., and rises to a height of about 80ft. above the street. The buildings are of brick, with stone dressings and Accrington red-brick facings; there are seven floors with a total floor area of fully half an acre. The building is in two departments, being divided vertically by a division wall, with communication on each floor, one side being for provisions, and the other for groceries. Each side is served by an electric lift running up the full height from basement to roof. All the machines used in the business are fitted with electric motors, and the lighting is by electricity throughout. There are entrance cartways on each side of the building, and six loading and unloading platforms, the openings to which are closed with steel revolving shutters when not in use. The private office and saleroom are on the ground-floor, the other offices being on the first floor. The buildings are heated with steam-pipes and radiators, and hot water is supplied all over the building where required. Messrs. Badenoch and Bruce were the architects; Mr. Alexander Bruce was the general contractor. The electric lifts are by Messrs. Waygood and Co., London, and the electric lighting and motors for machines, &c., are by Messrs. Thomas G. Usher and Co., Eldon Square. Messrs. Henry Walker and Son, Limited, have fitted up the steam-heating, hot-water supply, and bacon-drying arrangements.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED
		BUILDING.		
April	12	Ebbw Vale, Mon—Houses	Pretoria and Bloemfontein Building Clubs	J. P. Davies, Eureka Place, Ebbw Vale.
"	12	Hoylake, Cheshire—Lavatories, &c.	Urban District Council	T. Foster, Engineer, District Council Offices, Hoylake.
"	12	Morecambe—Additions	—	J. Hartley, Architect, Euston Chambers, Morecambe.
"	12	Celbridge, Ireland—Cottages	Rural District Council	F. Shortt, Clerk, Celbridge, Ireland.
"	12	Glasgow—Depot	Corporation	J. Young, 88 Renfield Street, Glasgow.
"	12	Golcar, Yorks.—Reseating	—	A. Shaw, Architect, Knowe, Golcar.
"	13	Sedgefield—Cottage Clocks	Durham County Lunatic Asylum	W. Crozier, Shire Hall, Durham.
"	13	Leeds Rooms	New Station Committee	W. Bell, North-Eastern Railway Company's Architect, York.
"	13	Glasgow—Bricks	Corporation	D. M'Coll, 64 Cochrane Street, Glasgow.
"	13	Walsall—Bricks	Rural District Council	F. W. Mager, Engineer and Surveyor, Aldridge, Walsall.
"	13	Bothal, Morpeth—Church Restoration	—	Boreham and Morton, 24 John Street, Sunderland.
"	13	Elgin—Cottages, &c.	—	A. and W. Reid and Wittet, Architects, Elgin.
"	13	Radcliffe, Lancs.—Offices	Pickstone and Jones	J. Sellers and Son, Union Chambers, Bury.
"	13	Walsall—Building	Gas Committee	B. W. Smith, Gas Engineer to the Corporation, Walsall.
"	15	Ynyshir, Wales—School Works	Ystradyfodwg School Board	J. Rees, Hillside Cottage, Pentre.
"	15	Eastbourne—Pavilions, &c.	Corporation	W. C. Field, Borough Architect, Town Hall, Eastbourne.
"	15	Wigan—Additions	Corporation	W. Bolton, Borough Engineer, Rodney Street, Wigan.
"	15	Leeds—Bird Market	Corporation	City Engineer's Office, Municipal Buildings, Leeds.
"	15	Abertillery, Mon.—Houses	J. Lancaster and Co., Ltd.	C. T. Evans, 8 Queen Street, Cardiff.
"	15	Burntisland, Scotland—Church	—	D. Robertson, 19 Shandwick Place, Edinburgh.
"	15	Dewsbury—House	—	C. H. Marriott, Son and Shaw, Church Street Chambers, Dewsbury.
"	15	Kilrea, Ireland—Repairs, &c.	—	Rectory, Hervey Hill, Kilrea.
"	15	Kinsale, Ireland—Kitchen Buildings	Convent of Mercy	S. F. Hynes, 21 South Mall, Cork.
"	15	Millom, Cumberland—Masonic Lodge	Masonic Buildings Company, Ltd.	Lawrence, Solicitor, Millom.
"	15	Silecroft, Cumberland—Farmhouse	—	J. W. Grundy and Son, Central Buildings, Ulverston.
"	15	Wrexham—Houses	—	J. Edwards, 45 Princess Street, Wrexham.
"	16	Ballymacreely, Ireland—Villa	—	W. J. Fennell, Scottish Provident Buildings, Belfast.
"	16	Evesham—Culverts	Rural District Council	E. Wadams, Union Offices, Evesham.
"	16	London, N.—Renovation, &c.	—	Vicarage, St. John's Church, Highbury Vale.
"	16	Llanbradach—Hotel	—	Teather and Wilson, Andrew's Buildings, Queen Street, Cardiff
"	16	Devizes, Wilts—Laundry	County Pauper Lunatic Asylum	C. S. Adye, County Offices, Trowbridge.
"	16	Harrow—Schools	United District School Board	Houston and Houston, 5 York Buildings, Adelphi, W.C.
"	16	Crewe—Van House	Health Committee	G. E. Shore, Municipal Offices, Earle Street, Crewe.
"	16	Dorking—Bridge	Rural District Council	W. Rapley, Holmwood, near Dorking.
"	16	Wealdstone, Harrow—Schools	United District School Board	Houston and Houston, 5 York Buildings, Adelphi, W.C.
"	16	Dublin—Slates, tiles, &c.	Railway	M. F. Keogh, Westland Row, Dublin.
"	17	Ashford, Kent—Alterations and Additions	Guardians	Young and Brown, 7 Southampton Street, Bloomsbury Square, W.C.
"	17	Bradford—Bridge	Urban District Council	J. H. Cox, City Surveyor, Town Hall, Bradford.
"	17	Oxford—Alterations, &c.	Corporation	City Estate Surveyor's Office, Town Hall, Oxford.
"	18	Cleethorpes—Schools	School Board	F. W. Croft, Victoria Chambers, Victoria Street, Great Grimsby.
"	18	Belfast—Timber Jetties	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Belfast.
"	18	Dundee—Seawall	—	W. Mackison, 91 Commercial Street, Dundee.
"	18	Ballindalloch, Scotland—Additions, &c.	—	C. C. Doig, Architect, Elgin.
"	18	Barrow-in-Furness—School	School Board	H. T. Fowler, Ramsden Square, Barrow-in-Furness.
"	18	Salford—Retort House, Floors, &c.	Gas Committee	Gas Engineer, Gas Offices, Bloom Street, Salford.
"	18	Athlone—Dwelling-houses	Building Society	Prendergast, Northgate Street, Athlone.
"	19	Culcheth, near Kenyon Junction—Cottage Homes, &c.	—	H. Lord, 42 Deansgate, Manchester.
"	19	Salford—Cottage Homes, &c.	Guardians	H. Lord, 42 Deansgate, Manchester.
"	19	Blackpool—School	School Board	H. Wade, Empress Chambers, Church Street, Blackpool.
"	20	Merthyr Tydfil—Cottages	Lancs Building Club	E. A. Johnson, Architect, Merthyr.
"	20	Carrickfergus—Houses	Governers of the Charles Shells Charity	Young and Mackenzie, Scottish Provident Buildings, Belfast.
"	20	Cressing, Essex—School Buildings	School Board	Clare and Ross, 66 Duke Street, Chelmsford.
"	22	Leeds—Reel House, &c.	Watch Committee	City Engineer, Municipal Buildings, Leeds.
"	22	Willenhall, Staffs—Extension of Fire Station	Urban District Council	T. E. Fellows, Town Hall, Willenhall.
"	23	London, S.W.—New War Office, Whitehall	Commissioners of H.M. Works, &c.	Sir John Taylor, H.M. Office of Works, Storey's Gate, S.W.
"	24	Clowne, Derbyshire—Lock-up	Standing Joint Committee	J. S. Story, County Offices, St. Mary's Gate, Derby.
"	25	Sunderland—Workmen's Dwellings	Corporation	Borough Surveyor's Office, Town Hall, Sunderland.
"	26	New Clee—Schools	Great Grimsby School Board	H. C. Scaping, Architect, County Chambers, Grimsby.
"	26	Great Grimsby—Schools	School Board	H. C. Scaping, Court Chambers, Grimsby.
"	30	Sunderland—Villas, &c.	County Borough Asylum at Ryhope	Borough Surveyor's Office, Town Hall, Sunderland.
		ENGINEERING.		
April	12	Brighton—Extension of concrete groynes	Town Council	F. J. C. May, Town Hall, Brighton.
"	12	Dundee—Hatch boxes, &c.	Water Commissioners	G. Baxter, 93 Commercial Street, Dundee.
"	12	Seville, Spain—Bridge of boats	His Majesty's Ambassador	Commercial Department, Foreign Office, Seville, Spain.
"	13	Colwyn Bay—Boiler, &c.	Urban District Council	Lacey, Clirehugh and Sillar, 2 Queen Anne's Gate, Westminster, S.W.
"	13	Wolverhampton—Heating and electric lighting schools	School Board	T. H. Fleeming, 102 Darlington Street, Wolverhampton.
"	15	Carronbridge, by Denny—Reservoir	Eastern District Committee	Warren and Stuart, 115 Wellington Street, Glasgow.
"	15	Farnworth, Lancs.—Tramway Track	Urban District Council	W. J. Lemox, 11 Fold Street, Bolton.
"	15	Kirkcaldy, Scotland—Plant	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
"	15	Leeds—Pipes &c.	Lighting Committee	H. Dickinson, Whiteball Road, Leeds.
"	15	Aberdeen—Fuel Economiser, &c.	Electric Lighting Committee	J. A. Bell, Cotton Street, Aberdeen.
"	15	Wimbledon—Cable, &c.	Urban District Council	Electric Lighting Works, Durnsford Road, Wimbledon.
"	15	Warrington—Pumping	Corporation	J. Deas, Municipal Offices, Warrington.
"	15	Ampthill, Beds—Boring	Urban Council	George and F. W. Hodson, Loughborough.
"	15	Hindley—Purifiers, &c.	Gas Committee	Manager, Gas Works, Hindley.
"	16	Poole—Electric Calls	Town Council	J. Elford, Borough Surveyor, King Street, Poole.
"	16	Portsmouth—Electricity Supply Extensions	Corporation	Superintendent, Electric Light Station, Gunwharf Road, Portsmouth.
"	17	Newport, Isle of Wight—Waterworks	Rural District Council	J. C. Millgate, Engineer, Newport.
"	17	Todmorden—River Diversion	Sanitary Committee	C. R. Pease, Borough Engineer and Surveyor, Town Hall, Todmorden.
"	17	Cranleigh, Surrey—Sewage purification works	Hambledon Rural District Council	E. L. Lunn, 36 High Street, Guildford.
"	17	West Ashford—Heating workhouse	Union Guardians	Young and Brown, 7 Southampton Street, Bloomsbury Square, W.C
"	17	Chatham—Steel Bridge	Town Council	A. T. Walmisley, 9 Victoria Street, Westminster.
"	18	Upleadon, near Newent, Glos—Reservoir	Corporation	R. Read, City Surveyor, Guildhall, Gloucester.
"	20	Edinburgh—Materials	Council, Lord Provost, and Magistrates	Engineer's Office, 5 Dewar Place, Edinburgh.
"	21	Palencia—Telephone System	Spanish Government	Commercial Department, Foreign Office, Palencia.
"	22	Glasgow—Bridge	Caledonian Railway Co	Engineer, Buchanan Street Station, Glasgow.
"	22	Dublin—Plant	Corporation	S. Harty, City Hall, Dublin.
		IRON AND STEEL.		
April	12	Valletta, Malta—Pipes, &c.	—	Public Works Department, Malta.
"	12	Leeds—Seat Legs	Corporation	City Engineer's Office, Municipal Buildings, Leeds.
"	12	Christiania—Tools	Ofoten Railway	Commercial Department, Foreign Office, Christiania.
"	13	Cockermouth—Pipes, &c.	Urban District Council	H. Baker, Gas Manager, Gas Works, Cockermouth.
"	13	London, S.E.—Stores	South-Eastern and Chatham Railway Companies' Managing Committee	Superintendent, 84 Tooley Street, London, S.E.
"	13	Glasgow—Iron Bolts and Nuts	Corporation	D. M'Coll, 64 Cochrane Street, Glasgow.
"	15	Birmingham—Pipes, &c.	Corporation	J. Mansergh, 5 Victoria Street, Westminster, London, S.W.
"	15	London, S.E.—Pails	Bermondsey Borough Council	F. Ryall, Town Hall, Spa Road, S.E.
"	16	Dublin—Iron Castings	Railway	M. F. Keogh, Secretary, Westland Row, Dublin.
"	16	Chorley—Pipes, &c.	Gas Committee	Gas Engineer, Gas Works, Chorley.
"	17	Christiania—Fishplate Screws, &c.	Norwegian State Railways	Railway Director's Office, Christiania.
"	18	East Ham—Fencing, &c.	Urban District Council	A. H. Campbell, Public Offices, Wakefield Street, East Ham.
"	18	Manchester—Pipes	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
"	19	Valletta, Malta—Pipes	—	Public Works Department, Malta.
"	20	Halifax—Granite and Setts	Highway and Tramway Committees	Borough Engineer, Town Hall, Halifax.
		PAINTING AND PLUMBING.		
April	12	Conway—Painting	Joint Water Supply Board	T. B. Farrington, Trinity Square, Llandudno.
"	12	Fleetwood, Lancs—Painting	Urban District Council	E. Frobisher, Town Hall, Fleetwood.
"	13	London, S.E.—Paints, Saltery, &c.	Railway Co. Managing Committee	Superintendent, 84 Tooley Street, London, S.E.
"	13	Glasgow—Paints, Oils, &c.	Corporation	D. M'Coll, 64 Cochrane Street, Glasgow.
"	15	everley, Yorks—Plumbing and Glazing	Trustees	J. Beaumont, Surveyor, Cross Street, Beverley.
"	16	ublin—Paints and Oils, &c.	Railway	M. F. Keogh, Secretary, Westland Row, Dublin.
"	20	Halifax—Oils, Paints, &c.	Highway and Tramway Committees	Borough Engineer, Town Hall, Halifax.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ROADS AND CARTAGE.		
April 12	Rothwell, Northants—Materials	Urban District Council	W. T. Pearson, Surveyor, Rothwell, Northants.
„ 12	Wantage—Materials	Rural District Council	District Surveyor, East Ilsley.
„ 13	Stafford—Road Metal, &c.	County Council	J. Moncur, County Council Buildings, Stafford.
„ 13	Southborough, Kent—Stone	Urban District Council	P. Hanmer, Clerk, Council Offices, Southborough.
„ 13	Middlesborough—Road	———	Borough Engineer's Office, Municipal Buildings, Middlesborough.
„ 13	Levenshulme, Lancs—Street Works	Urban District Council	J. Jepson, Guardian Chambers, Teviot Dale, Stockport.
„ 13	Hayward's Heath, Sussex—Paving, &c.	Urban District Council	E. Waugh, Clerk, Hayward's Heath.
„ 13	Walsall—Kerbs, &c.	Rural District Council	F. W. Magor, Engineer and Surveyor, Aldridge, Walsall.
„ 13	Whitby—Quarrying, &c.	Rural District Council	J. Syth, District Surveyor, Whitby.
„ 15	London, S.E.—Water Vans	Bermondsey Borough Council	R. J. Angel, Borough Surveyor, London, S.E.
„ 15	Abertillery, Mon.—Roads, &c.	J. Lancaster and Co., Ltd	C. T. Evans, 8 Queen Street, Cardiff.
„ 15	Stockton-on-Tees—Materials	Rural District Council	W. Benton, Highway Surveyor, Billington, Stockton on-Tees.
„ 15	Sutton Bridge, Lincs—Road Materials	Urban District Council	Surveyor to the Council, Sutton Bridge.
„ 15	Hoylake, Cheshire—Materials	Urban District Council	L. G. Dashper, District Council Offices, Hoylake.
„ 15	London, S.E.—Water Vans	Bermondsey Borough Council	R. J. Angel, Borough Surveyor, London, S.E.
„ 15	Selby—Whinstone, &c.	Urban District Council	B. M. Gray, Town Surveyor, Town Hall, Selby.
„ 15	Wickham Market Suffolk—Materials	Rural District Council	T. W. Read, Clerk, Wickham Market.
„ 16	Carshalton—Tar-paving Material	Urban District Council	W. W. Gale, Surveyor to the Council, Carshalton.
„ 16	Seaford, Sussex—Paving, &c.	Trustees	B. A. Miller, 3 Churton Place, Seaford.
„ 18	Woolwich—Water Vans	Borough Council	F. Sumner, Borough Engineer and Surveyor, Maxey Rd., Plumpstead
„ 18	Fenton, Staffs.—Materials	Urban District Council	S. A. Goodall, Surveyor, Town Hall, Fenton.
„ 19	Hayland, Nether, near Barnsley—Slag	Urban District Council	W. P. Young, Surveyor, Town Hall, Hayland.
„ 20	Hambledon, Guilford—Materials	Rural District Council	Lintott, Cranleigh.
„ 20	Halifax—Granite Setts, &c.	Highway and Tramway Committees	Borough Engineer, Town Hall, Halifax.
	SANITARY.		
April 13	Glasgow—Lime and Cement	Corporation	D. M'Coll, 64 Cochrane Street, Glasgow.
„ 13	Walsall—Lime and Cement	Rural District Council	F. W. Magar, Engineer and Surveyor, Aldridge, Walsall.
„ 15	Sevenoaks—Storm Water Pipe Drain	Urban District Council	T. Hennell, 6 Delahay Street, Westminster.
„ 15	Ellesmere Port, near Chester—Sewers, &c.	Wirrall Rural District Council	Beloe and Priest, 13 Harrington Street, Liverpool.
„ 16	Oradley Heath—Sewers	Quarry Bank Urban District Council	W. Fiddian, Old Bank Offices, Stourbridge.
„ 16	Walsall—Sewers, &c.	Corporation	Borough Surveyor's Office, Bridge Street, Walsall.
„ 17	Birmingham—Sewage Carriages, &c.	Rea District Drainage Board	J. D. Watson, Tyburn, near Birmingham.
„ 17	Leeds—Sewering, &c.	———	T. Hewson, City Engineer, Municipal Buildings, Leeds.
„ 17	Cranleigh, Surrey—Outfall Sewer	Hambledon Rural District Council	E. L. Lunn, 36 High Street, Guildford.
„ 18	Blackburn—Sewage Conduit	Sewage Committee	W. Stubbs, Municipal Offices, Blackburn.
„ 19	Banff, Scotland—Drainage Works	District Committee	G. Cumming, District Clerk, Banff.
„ 20	Halifax—Stoneware Pipes, &c.	Highway and Tramway Committee	Borough Engineer, Town Hall, Halifax.
„ 20	Acome, Yorks—Sewers, &c.	Great Ouseburn Rural District Council	F. S. Capes, Clerk, Borough Bridge, Yorks.
	TIMBER.		
April 13	Glasgow—Wood	Corporation	D. M'Coll, 64 Cochrane Street, Glasgow.
„ 18	Tooting Graveney, S.W.—Wood Floors	Asylums Board	Board Office, Embankment, E.C.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
April 30	Keighley—Public Library	£50, £30, £20	W. H. Hopkinson, Borough Engineer, Town Hall, Keighley.
June 10	Ennis, co. Clare—Additions, &c., to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
„ 24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100 respectively	W. H. Talbot, Town Clerk, Town Hall, Manchester.
„ 24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
No date	Gillingham—School	£10, £5	E. T. Atchison, 28 Waterloo Road, New Brompton.
No date	Darlington—Row of Shops and Dwelling Houses	———	Borough Surveyor, Town Hall, Darlington.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the Work.

BEDFORD.—For the erection of a new shop front, Tavistock Street. Mr. Harvey Sale, architect, Bedford:—

R. Black	£96 15	T. Coleman	£92 0
Cooke & Parrott	96 0	C. Negus*	89 10

* Accepted.

BEDFORD.—For alterations to premises, 169 Tavistock Street, for Mr. Walter Grant. Mr. Harvey Sale, architect, Bedford:—

Rootham	£209	T. Coleman	£193
C. Negus	204	James Ebden*	168
Cooke & Parrott	193		

* Accepted.

BEDFORD.—Accepted for the erection of a new shop front, St. Peter's Street, for Mr. Whitbread, of the "Old George Inn," Bedford. Mr. Harvey Sale, architect, Bedford:—

Cooke & Parrott	£195

BITTERNE, Hants.—For the drainage of Bitterne, for the South Stoneham Rural District Council:—

Nicol & Duke	£6,228	H. Plascott & Son	£5,998
F. Osman	6,003	S. Saunders,* London	5,837

* Accepted. [Engineer's estimate, £6,790 10s. 9d.]

BLACKHILL, Durham.—For the extension of cemetery at Blackhill (fence walls, drainage, road-making, &c.), for the Benfieldside, Consett, and Knitsley Joint Burial Committee. Mr. Geo. Thos. Wilson, architect, 121 Durham Road, Blackhill:—

E. Taylor, Durham	£1,670 2 0
J. Allison, Rosemount, Consett	1,310 0 0
J. Eltringham,* Railway Terrace, Blackhill	1,300 0 0

* Accepted.

BLYTH, Northumberland.—For the erection of new premises in 5 Bridge Street, Blyth. Mr. J. Goulding, jun., architect, Blyth:—

R. Baxter, Blyth	£3,052 0 0
J. & W. Simpson, Cowpen Colliery, Blyth	2,925 14 6
Barron & Temple,* Cowpen Quay, Blyth	2,881 17 7

* Accepted.

CHINGFORD.—For the erection of a new factory at Hale End. Messrs. Searle & Hayes, architects:—

Maxwell Bros, Limited	£1,824	A. Barton	£1,509
Lascelles & Co.	1,716	Dobson	1,438
W. Shurmur	1,548		

FRINTON-ON-SEA, Essex.—For making up and sewering portions of Second Avenue, Third Avenue, Ashlyns Road and Holland Road, Frinton-on-Sea, for Mr. R. Powell Cooper. Messrs. Homer & Co., surveyors, Estate Office, Frinton:—

Pedrette & Co.	£10,671 13 10	F. W. Anderson	£6,915 0 0
Dupont & Co.	7,514 0 0	H. J. Linzell	6,638 9 0
J. E. Trueman	7,415 0 0	Mackenzie & Sons*	6,106 12 8
E. West	7,370 0 0	Burgoyne & Sons*	5,971 14 7
Moran & Sons	6,987 17 8		
R. Moore	6,962 11 7		

* The contracts were divided between Mackenzie & Sons and Burgoyne & Sons.

GLOUCESTER.—For the erection of new buildings in connection with new buildings for refuse destruction, for the Corporation. Mr. Harry A. Dancey, architect, 26 Clarence Street, Gloucester:—

A. & E. King	£4,960 0 0	T. J. Williams	4,096 0 0
J. Gurney & Sons	4,731 19 1	W. Bowers & Sons,* Hereford	4,027 0 0
W. Jones	4,560 0 0		
W. Byard	4,305 0 0		

* Accepted.

[Rest of Gloucester.]

LONDON.—For proposed rebuilding of 39, 40 and 43 Trinity Square, for the Executors of the late Mr. C. J. Knowles, from drawings prepared by Mr. C. Watkins, of Glebe House, Sherborne Lane, E.C., exclusive of fixtures and fittings. Quantities by Mr. Deacon:—

Lascelles & Co.	£27,300	H. Lovatt	£26,250
Patman & Fothering-ham	27,280	Colls & Son	25,860
Ashby & Horner	26,987	Foster & Dicksee	25,716
F. & H. F. Higgs	26,938	W. Downs	25,434
		Greenwood	25,374

LONDON.—For the erection of a new storey over ante-room, &c., in order to provide a new drawing office for Architect's Department at the head offices, for the London School Board. Mr. T. J. Bailey, architect:—

E. Triggs	£2.960	E. Lawrance & Sons	£2,478
Lathey Bros.	2,949	J. Garrett & Son	2,414
Holloway Bros.	2,720	T. L. Green	2,187
H. Wall & Co.	2,680	Stevens Bros.	2.060
F. & H. F. Higgs	2,644	E. P. Bulled & Co.*	1,945
F. G. Minter	2,638		

* Recommended for acceptance.

LONDON.—For improvements at Edinburgh Road School, for the London School Board. Mr. T. J. Bailey, architect:—

W. King & Son	£9,517 0 0	O. Craske	£8,848 0 0
J. Simpson & Son	9,280 0 0	Leslie & Co., Ltd.	8,814 7 2
J. & M. Patrick	9,051 0 0	Patman & Fotheringham, Ltd.	8,473 0 0
Treasure & Son	8,953 0 0	J. Garrett & Son*	7,984 0 0
Martin, Wells & Co.	8,904 0 0		
W. H. Lorden & Son	8,852 0 0		

* Recommended for acceptance.

LONDON, E.—For the erection of stable buildings, Richardson Street, Whitechapel, E., for Mr. E. Rochester. Mr. Ernest H. Abbott, architect, 6 Warwick Court, Gray's Inn. W.C. Quantities by Mr. Alfred Johnson, 34 Imperial Buildings, Ludgate Circus, E.C.:—

A. Webb	£6,379	A. E. Symes	£5,640
W. Harper	6,028	R. & E. Evans	5,550
W. Walker	5,668	G. Maddison	5,499

LONDON, N.E.—For the erection of gymnasium at Mare Street, Hackney. Mr. F. S. Hammond, architect:—

W. Shurmur	£2,394	S. J. Scott	£2,381
Larke & Son	2,384		

LONDON.—For the erection of special school, Daniel Street, for the London School Board. Mr. T. J. Bailey, architect:—

J. Chessum & Sons	£3,957 18 2	G. S. S. Williams & Son	£3,556 0 0
Treasure & Son	3,738 0 0	E. Lawrance & Sons	3,537 0 0
Clarke & Bracey	3,711 0 0	Patman & Fotheringham, Ltd.	3,387 0 0
Leslie & Co., Ltd.	3,626 6 1	Willmott & Sons, Hitchin*	3,352 0 0
H Wall & Co.	3,621 0 0		
J. Grover & Son	3,595 0 0		
W. McCormick & Sons	3,585 0 0		
C. Cox	3,556 0 0		

* Recommended for acceptance.

LONDON, N.—For the erection of printing works, Tottenham, for Messrs. J. M. Kronheim & Co. Mr. Ernest H. Abbott, 6 Warwick Court, Gray's Inn, W.C., architect. Quantities by Mr. Alfred Johnson, 34 Imperial Buildings, Ludgate Circus, E.C.:—

Griffiths & Co., Ltd.	£5,215	Wells & Son	£4,775

LONDON, N.E.—For alterations, &c., at 204 and 206 Lower Clapton Road. Mr. J. H. Bethell, architect:—

Lidstone & Son	£2,185	Limes	£1,905
G. Sharpe	2,100	Gerard	1,885
Silk & Son	1,990	Robey	1,800
W. Shurmur	1,980	Snewin Bros. & Co.	1,674

LONDON, S.W.—For the erection of a house, Aldrington Road, Streatham. Mr. William H. Burt, architect, 10 Bush Lane, E.C.:—

Smith & Sons	£3,837 0	Lorden & Sons	£2,719 15
Courtney & Fairbairn	2,939 0	Bulled & Co.*	2,689 0
G. P. & H. Barnes	2,756 0		
Patman & Fothering-ham	2,754 0		

* Accepted.

PETERBOROUGH.—For the erection of shops, &c., in Cowgate and King Street, for Mr. C. F. Thomson. Mr. J. G. Stallebrass, architect, North Street, Peterborough:—

Shops.

Thurley Bros.	£4,880 0 0	J. Lucas	£3,598 0 0
J. Woolston	4,340 0 0	J. Cracknell	3,564 0 0
R. Shanks	4,150 0 0	R. J. Nichols	3,558 14 0
C. F. Colls	3,998 0 0	F. H. Nichols	3,527 13 0
Bridgfoot & Son	3,922 18 1	D. Gray	3,431 9 0
J. Guttridge	3,779 0 0	H. Watson,* Peterborough	2,997 0 0
Hipwell & Co.	3,600 0 0		

* Accepted.

SALTASH.—For alterations and additions to No. 2 Port View Villas, for Mr. J. Bennett. Mr. Edgar M. Leest, architect, Saltash and Devonport:—

S. E. D. Ough	£274 10	W. V. Alford	£260 0
W. H. Rothery	264 0	Taylor & Mutton*	245 0

[All of Saltash.] * Accepted.

TOTNES, Devon.—For the erection of Wesleyan church and schools, Fore Street, Totnes, for the Trustees. Messrs. Bridgman, A.R.I.B.A., and Bridgman, M.S.A., architects and surveyors, Bank Chambers, Torquay and Paignton. Quantities by Mr. V. C. Brown:—

W. A. Goss, Torquay	£2,100 0 0
R. F. Yeo, Torquay	2.062 12 0
Arscott & Son, Buckfastleigh	1,941 0 0
T. Brown, Torquay	1,888 0 0
J. C. & W. Watson, Torquay	1,880 0 0
T. Brooks, Totnes	1,727 18 0
Reeves & Son,* Totnes	1,711 0 0

* Accepted.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

April 17, 1901.
No. CCCXXIII.

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An Architectural Causerie.

Queen Victoria Memorial.

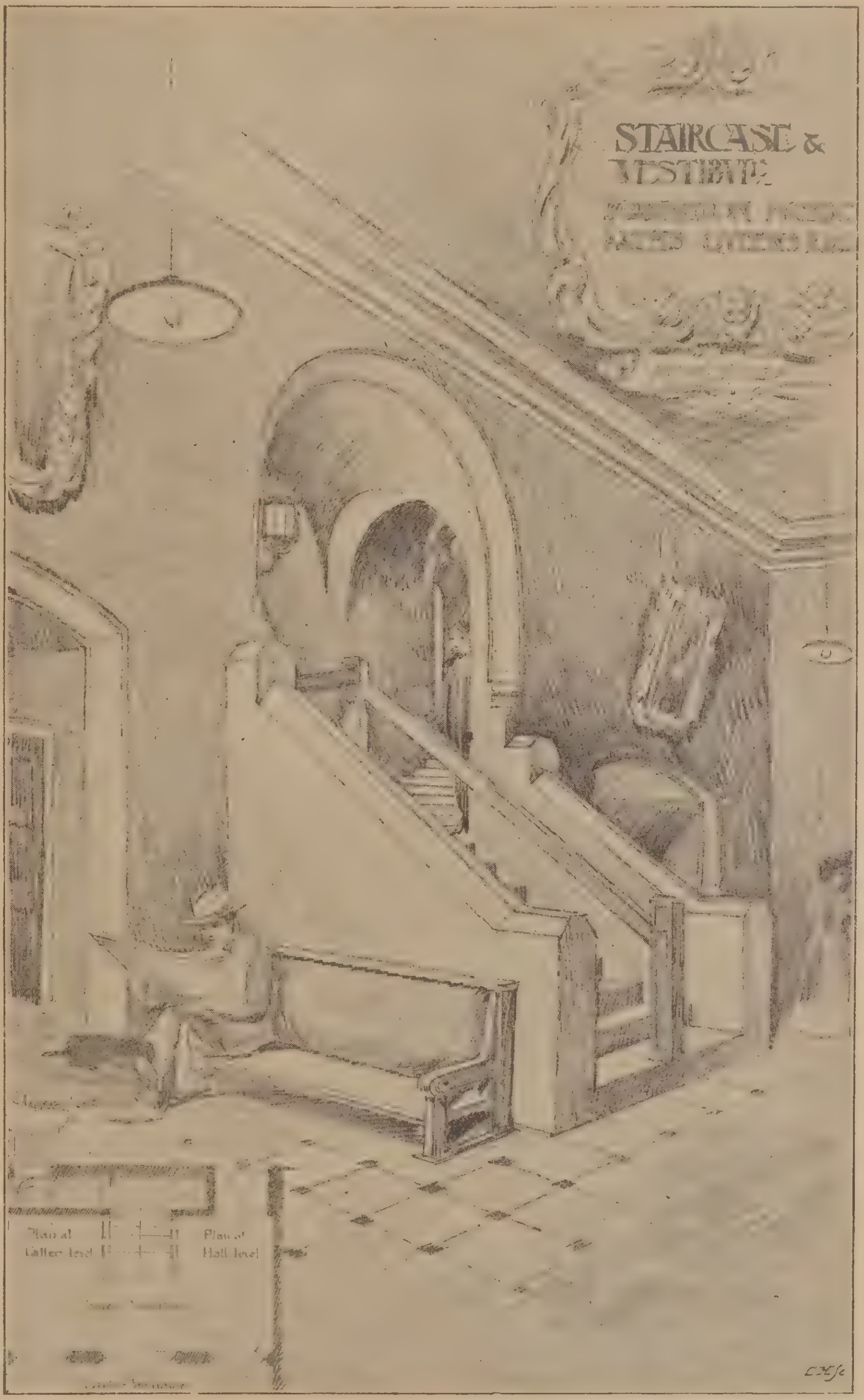
A lively criticism is proceeding in the daily press respecting the Queen Victorial Memorial; we give the gist of it on another page. From this it will be seen how the decision of the Executive Committee is censured by leading architects, sculptors, and designers. We need not reiterate these opinions here, for in this column we have already expressed ourselves—among the very first—on the unwise selection of one sculptor and five architects for the Memorial. There are rumours that the committee will reconsider their proposals, in view of the loud outcry which is being made against them. We hardly think, however, that they will change anything for the present. The selected architects will send in their designs to the Office of Works by the end of June. After that we may expect changes and reconsiderations, but hardly before.

The Balcony and "Loggia."

There is perhaps nothing which so strikes an Englishman upon his first visit to Paris as the profusion of balconies, the more so, indeed, from their rare and declining use in his own country. There is one to nearly every window, and the straight lofty streets seem to his unaccustomed eyes like a vast bird-cage, for these projections are all of iron; they are light, strong, generally of simple design, sometimes more elaborate, and occasionally enriched with ornamental brasswork or gilding. The windows are one and all casements—in the larger rooms they open to the floor; outside each is a pair of *jalousies* or wooden sun-blinds on hinges; the entire city is of light-grey stone, inclining to cream colour. From the point of view of architectural effect, the immense straight streets are grand, but after a time they become slightly monotonous; what relieves them is the balcony. It speaks well for the taste of Parisians that the variety of design in balconies is so great; some slight difference can always be observed at each storey, and between one block of buildings and its neighbour.

Other northern capitals and provincial cities, though making much use of the balcony, do not employ it so profusely as Paris; in all, however, it is a recognised building adjunct, and a popular architectural feature. In the South of Europe it is in general use; Charles Dickens said that in Italy it "rained balconies." They are generally of stone, but the effect is less graceful than in France. The balcony is looked upon as a necessary extension of the room in a hot country, and is provided with seats, and coloured cushions over the balustrade to lean the arm upon; little orange trees in tubs are often placed within it, and enliven the street with their green leaves and golden fruit.

Less frequent in use, but always effective, is the loggia, or open recessed gallery; it is practically an opening in the front, usually in the second storey from the ground, columns, and sometimes arches, taking the place of wall; it thus creates a fine covered gallery, which differs from a balcony in not projecting beyond the face of the building; the columns appear as lines of light against a hollow background of shade. Another form of loggia is found in the numerous *campanile* or bell-towers of Italian cities; near the summit a post for a watchman in time of war was required, and a ring of columns and open arches was introduced, enabling a warder to survey the surrounding country; these are still sometimes used as look-outs for fire.



DRAWN BY E. A. RICKARDS.

Above the loggia the tower is usually continued upwards in some graceful form, and occasionally, as in the tower of St. Mark at Venice, terminates in a stone pyramid or steeple.

In England the balcony has never been very popular. The Palladian houses of the last century which make up the greater part of central London have shallow balconies to the drawing-room floors, but they are little used and of questionable safety; the vast stucco regions built in the present century, extending southward from Hyde Park Corner and westward from the Marble Arch, exhibit the balcony also, but it is of one uniform design as far as the eye can reach, a paltry feature. The balcony counts for little in the most recent designs, although it might be of some use in case of fire in the lofty structures now being built. In the suburbs there is a species of balcony not infrequently seen which is intensely ridiculous; it is so constructed that no one can enter it; it is impossible even to utilise it for displaying flowers. Of the loggia two fine examples have recently been given to London in the new Her Majesty's Theatre and the Carlton Hotel; they are eminently appropriate to a Palladian building.

SOME THOUGHTS ON PLANNING.*

By ARTHUR T. BOLTON.

THE Art and Science of Planning is a subject so extensive in its scope, and of such vital importance to us as students of architecture, that I have specially asked to be allowed to reduce the title of my paper to that of "Some Thoughts on Planning," so as to give a right impression that I am attempting nothing more than some of those thoughts on this subject which occur to us in our daily work.

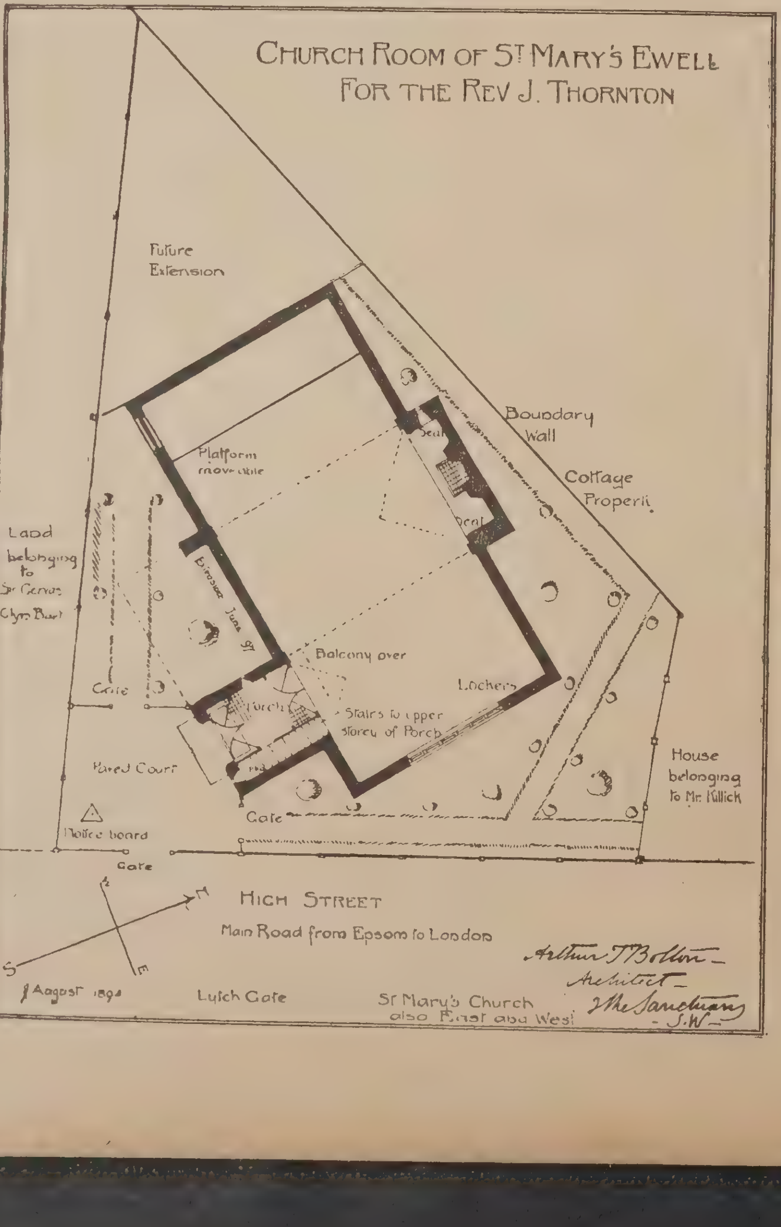
Looking back, if I may venture to allude to personal experiences, I feel that as a student some of the points which I hope to make clear to you would have been of the greatest assistance to me had I been able to grasp their significance at the time. The help that an older student can offer to a younger is that of shortening the road by which he will have to travel, by suggesting some of the principles and methods that, in his experience, govern the majority of cases. This enables the student to avoid those circuitous methods of reaching his goal which swallow up so much precious time and energy. I trust that some such assistance may be derived by some of you from the reading of this paper.

I heard a student whose plan had been somewhat severely criticised say he supposed planning could be acquired like everything else; while the question is often asked, Can planning be taught? Personally, I think it should be put the other way, as, How can I learn, or how can I teach, the art and science of planning?

First of all, then, as to the importance of planning, in regard to which I shall only quote a characteristic and conclusively brief sentence of an architect, one whose achievements have exerted a great influence on modern architecture—"I love plans." Gentlemen, I do not for a moment suppose that, knowing the keen life and the active practice characteristic of Birmingham, I can tell you anything on many sides of this question of planning that you do not know much better yourselves. In fact, I desire rather to apologise for attempting such a subject; but circumstances have lately led me to think that some such thoughts as I have put together would really be of service to the younger students. Besides, I desire to plead for a greater recognition of the artistic aspect of planning, and to urge that all is not done when a clever adjustment of the requirements of the case has been found to be workable, but that a good plan is one which by good internal and external elevations reveals itself as fine architecture.

CHURCH ROOM OF ST. MARY'S EWELL.

The first point for the student, then, shall be this—learn to plan by learning first to get up your subject. Well do I know that easy and fatal path that leads to useless schemes, the idea that the conditions given to you have only to be shaken and turned inside out, twisted together, and made into a plan. It is so much trouble, and often involves expense, to go and see similar buildings, to look up modern examples, to consult managers and worry experienced friends, as well as to collect a thousand-and-one trivialities of detail, not to mention the fallacious thought at the back of your mind that the result will be so much more original, and there will be no cribbing, if you do it all off your own bat.



Consequently, as "nothing out of nothing comes," your costly and laborious set of drawings will not be looked at by any judge, because, however ingenious certain parts may be, he will recognise at a glance that they are only elaborations of a scheme based in some essential on a wrong principle.

Besides one's own little affairs of this kind, this year's Soane is a striking instance of what I mean. The subject, "a club in a large city," was a particularly good one, and drew an exceptional response in the point of the number of the competitors, but no award of the prize has rightly been made, because there was not a single satisfactory scheme. One of the judges is reported as saying "he did not suppose anyone of the competitors had ever been inside a first-class club in his life"—a pithy and polite way of putting the point.

A good architect must have the barrister's power of getting up a case. If clients only knew it, such ability may be a much better recommendation in an architect than the fact of having built a similar building before. You cannot start too early on such lines. Suppose you have as a class design a shop or a doctor's house, a hospital, or what not; live for the time with the one idea, first, of what, say, a shop is, and afterwards of what it ought to be; look up shop plans, visit shops, worry shopkeepers with the why and the wherefore. Ask an agent why those shops of his do not let. Enquire of your lady friends their favourite shop, bore everybody with shops till you have the facts at your finger's end, and then you will give us the shop as it ought to be with some chance of success.

Secondly, in this pursuit of knowledge, be exact. Measure, do not sketch, plans; or if you put dimensions on to notes of plans, let it be so that the said plan will draw out to scale. Experience acquired in plotting plans will save you much time in planning schemes in the rough, as you will instinctively avoid errors and impossibilities of scale. Remember that 6 in., say, in the width of dining-room, will make the difference between what will just do and a failure. Put to every dimension you have not taken exactly a (c), as this practice will lead you to avoid guesses, especially after a plan or two has failed to work out in the plotting out on paper.

An old foreman taught me a lesson in that connection. When I said some dimension was about my height, he said: "Ah, that was like the apprentice who was sent from the shop to the job to measure an opening, and returned through the streets calling out to the people to make way, as his outstretched arms gave the width of a door."

Similarly you should endeavour to have at instant command the sizes of all ordinary parts of a building, common fittings, and furniture. Few things are more deceptive. For instance, how rarely one has the courage to draw a counter 3ft. wide; it looks so enormous on an ⅛th scale plan, and many a disagreeable experience has awaited the architect in consequence of shirking the inevitable in the shape of the actual fitting-up and furnishing of his plan. Service and other unattractive parts of the plan are frequently cramped in the same way for the sake of the grand rooms, in which, however, hereafter you will see unsightly encroachments rendered necessary by such want of prevision.

In this pursuit of knowledge it is a great mistake to ignore the officials and domestics who will have the working of the building. A good architect would, if he had the option, consult everyone, however humble his position, on that part of the building which came within his own particular sphere. A curious instance on this point was related to me of a very eminent architect by a friend of the client in question—all parties being now deceased. It was a case of a house alteration where, as the kitchen was at a great distance, a corridor to the dining-room had to be built, and the butler stipulated for a width ample to allow two men with full trays to pass each other. On the client representing this to his architect he was told to leave everything to him and all would be well; the butler, however, while the corridor was building, protested that it was too narrow, but without effect so far as the architect was concerned; on completion, however, the failure was evident to all, and great expense had to be incurred in correcting the mistake. Cases like this are to be avoided at all costs, as few things

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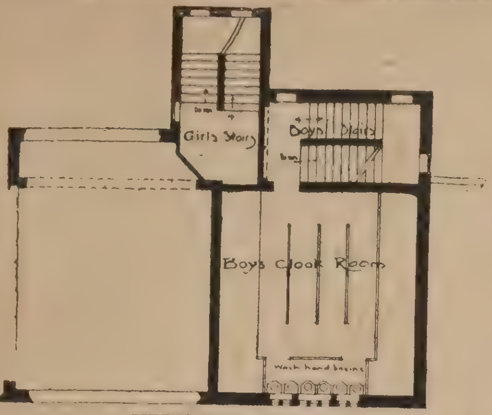
* A paper read before the Birmingham Architectural Association on March 8th, 1901.



MEZZANINE FLOOR.

contribute more to bring discredit upon our profession. Such cases form, I fancy, the basis of the legend of the forgotten staircase so generally cast in our teeth.

As a counterpart, take the example of John Dobson, of Newcastle, who spent a whole day on a railway platform studying the traffic before he hit on the idea of a circular sweep to the station as the best solution of the problem.

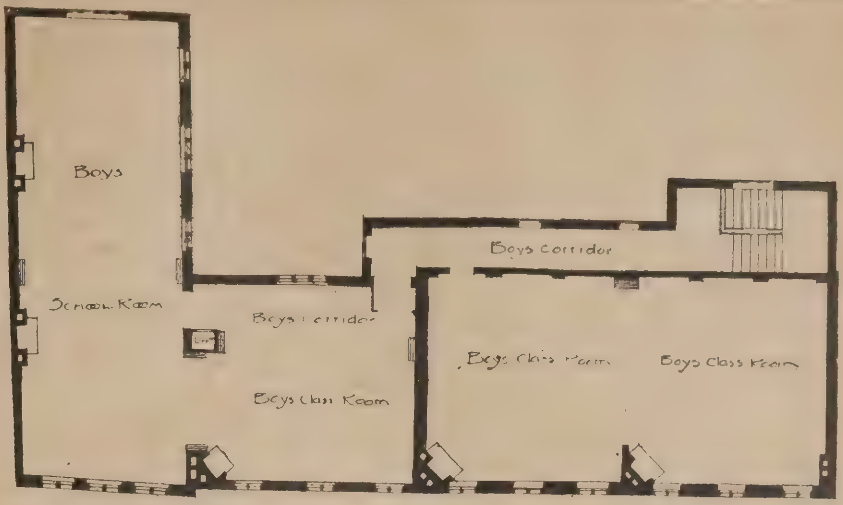
Such study pushed to extremes leads to highly specialised planning, as to which I have considerable doubts. It appears to me that, particularly in such cases as municipal offices, &c., it will often prove a failure, as by reorganisation and change of character, reductions or extensions of staff, &c., the original basis of the scheme will be so upset that the special points of the plan will be quite lost. I have observed in Continental public plans that one is often unable to determine the particular work to be carried on in the building. You have a kind of official disposition convenient and easily available for any kind of office work, so that I fancy it is possible to over-specialise in such matters. In house planning over-specialisation, showing itself in a neglect of the average requirements of people, may involve a serious loss to a client's family, if not to himself, owing to the house being either unsaleable, or only to be disposed of at a sacrifice. It may become your duty in the case of a client with fads to point out the risk of such a contingency.

Regarding Receipts and Tricks in Planning.

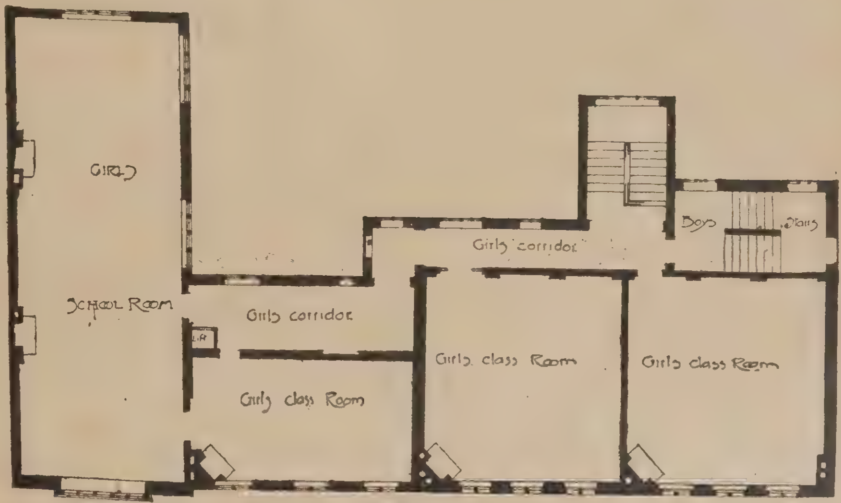
I have for the former no hints to give you; in fact, I do not believe in either. No two cases will ever really be quite on the same footing; and while types of plan are to be recognised and studied most carefully, ready-made solutions are to be regarded with the utmost suspicion. For the latter they never succeed in more than at the most a first impression, and are a nuisance ever after. Good planning is essentially simple and straightforward; it requires no explanation when the requirements are known, and it appears so obvious that it excites no remark. It is quite too easy to those who do not know. Bad planning you cannot follow; it has to be explained, not to say excused. It is incoherent, and has no definite aim. It is wrong in scale, wasteful and yet cramped, costly to construct, and incapable of any adaptation or extension.

Some good judges maintain that there is always a "best plan," if not "the only plan," in each case, and that the student must exhaust every possible combination in order to satisfy himself that he has the true solution. It certainly is a duty to satisfy yourself that there is no alternative to the plan you have adopted. I think, however, that with experience you will quickly be able to run over the various possibilities, because, as a rule, what appear to be alternatives are only a snare.

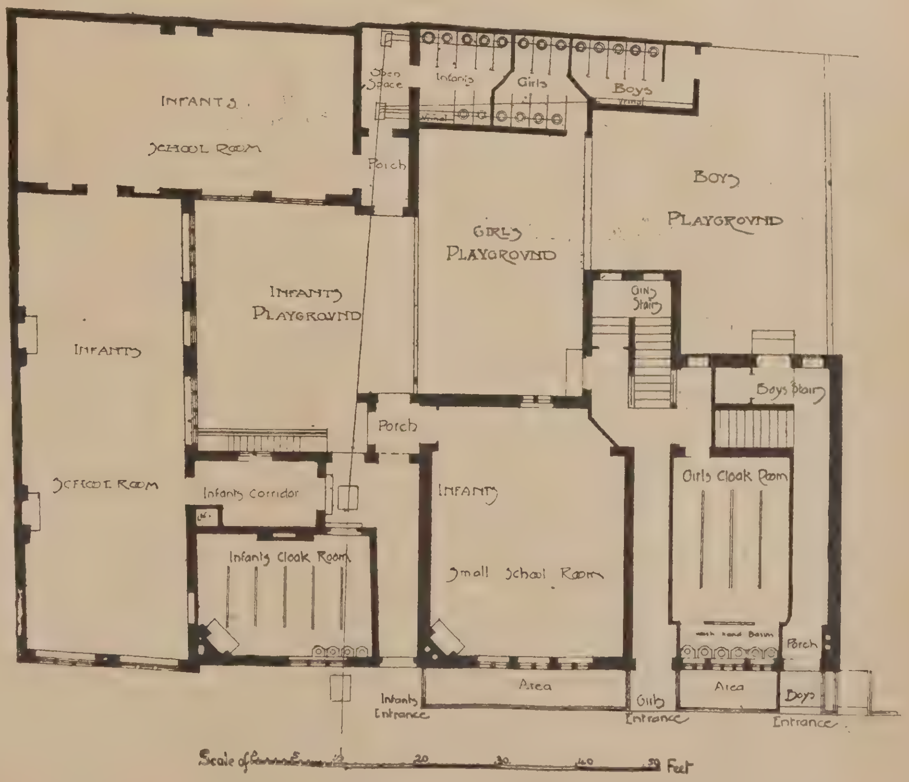
Having observed the evil results to students of over-much change in their ideas, I believe that it is best to be rather slow to start your scheme on paper. A student who has well turned over his idea in his mind before roughing it out on paper will often find that such a first sketch, however many alternatives he may afterwards very properly attempt, remains after all the true solution. It is recorded that Barry noted on the back of an old envelope the idea of the masterly plan of the Houses of Parliament, from the main lines of which, for all his subsequent alterations and improvements, he never departed. I have often admired the clear-headed way in



SECOND FLOOR.

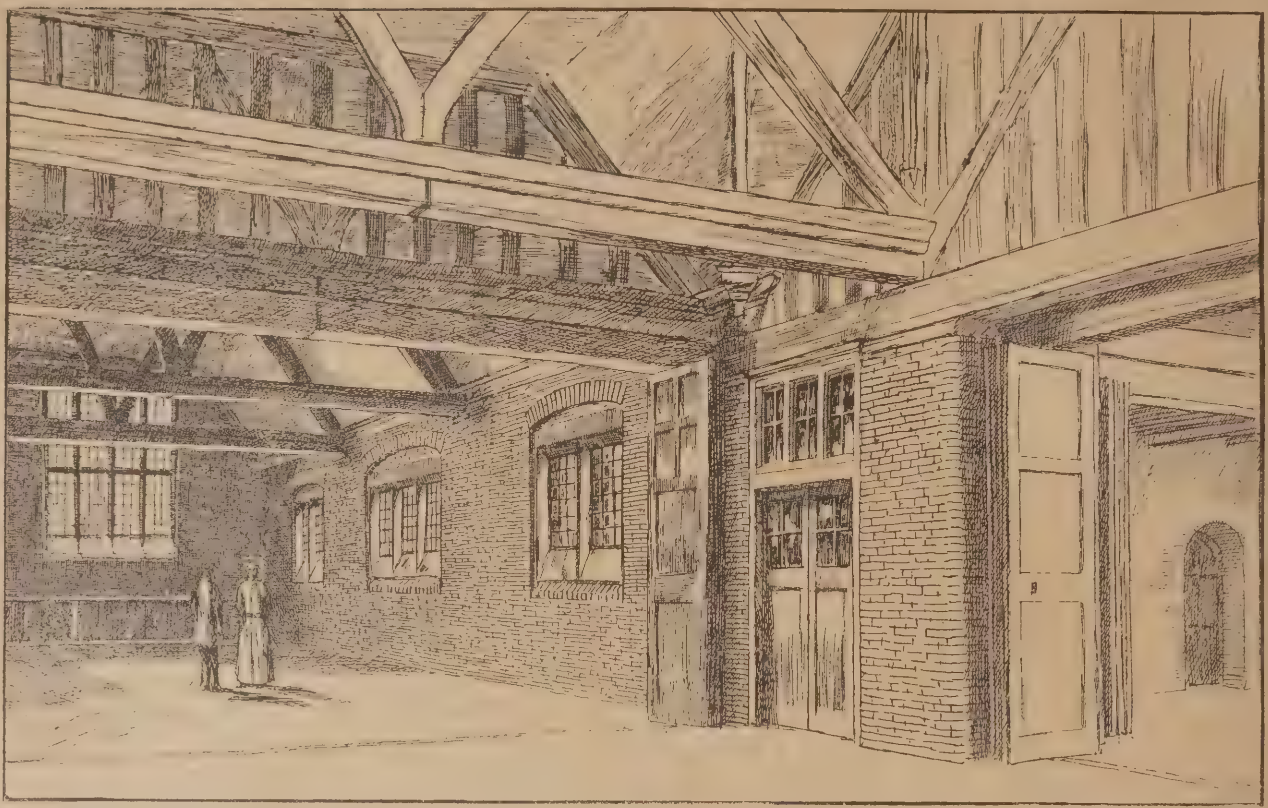


FIRST FLOOR.



GROUND FLOOR.

PLANS OF ST. STEPHEN'S NATIONAL SCHOOLS, PADDINGTON. ARTHUR T. BOLTON, ARCHITECT.



ST. STEPHEN'S NATIONAL SCHOOLS, PADDINGTON: IN THE NEW BOYS' SCHOOLROOM, LOOKING SOUTH. DRAWN BY F. L. B. GRIGGS.
ARTHUR T. BOLTON, ARCHITECT.

which some students will, after an apparently casual examination of a series of designs, tell you in a few words the main idea of each. As old soldiers give their battles after dinner, so schemes are often originated and described by a diagram in cutlery. In time you will probably come to distrust a scheme that requires the production of many sheets of drawings and interminable *viva voce* explanations.

Such selective power arises from a recognition, possibly unconscious, of types in plan. It can be acquired, I think, by a deliberate study of the evolution and development exhibited in a successive series of plans. Every student should, for the purpose of comparative study of type, pursue one or more branches of this subject, as, for instance, the growth of the church plan of to-day from the early times; the development of the house plan in this country as compared with that of, say, France or Italy; the origin and progress of elementary school planning; or even the ceaseless problem of the jerry-builder's house at an absolutely knock-out price.

A word must now be said as to the financial aspect of this part of our work. A mistake in planning may be a very costly affair—houses that will not let, or only at a reduced rental; offices depreciated by the entrance being in the wrong street; hotels that are costly to staff and maintain; these are a few only of the instances that might be given under this head. Often your plans may be the basis of a financial scheme; that is to say, a given sum being provided, you have to arrange for a fixed return upon the money in the shape of the annual interest and proportionate repayment of capital. In a case of this kind you will be wise to consult with an experienced surveyor, but I would urge upon you the importance of grasping the points at issue yourself as well, and of bringing within your philosophy of art, whatever it may be, some conception of architecture as the outcome of conditions more often than not prescribed by tendencies beyond any individual control. Complying with the social and other circumstances of your own time, carry on the great traditions of historic architecture.

It would obviously take up too much space to go fully into the question of common errors, and of the ordinary causes of failures in plan, against which you have to be on your guard; but I hope it may be useful to suggest a few heads under one branch—that of house planning. Avoid, therefore, the following bad qualities:—

1. House plans in public work, and *vice versa*.
2. Excessive smallness in size, and the reverse.
3. Disproportion of the various services.
4. Expense in maintenance and in staffing.
5. Absence of privacy.
6. Extreme compactness, resulting in noise.
7. Dangerous and difficult complexities.
8. Bad levels and wrong aspects.
9. Draughts and bad lighting.

A similar table may be made for each group of plans, though of course many of the points will recur in each, with simply another shade of meaning.

Certain common traps and pitfalls may be indicated, as the two-storeyed hall containing a staircase with gallery at the first-floor level, which is a favourite amateur receipt, whatever the size of the house. I imagine everyone starts by a try at that idea. A variation of the same is a grand square hall, vaulted all ways on to a central pillar, the scale being probably about 4ft. to 5ft. clear span of the arches. Most disastrous of all, however, is the miniature lobby, a maze of doors opening in conflicting directions, the outcome of an ill-jointed plan. Traps of this kind can only be avoided by a close study of actual work, which makes it impossible for you to rough out, even in your preliminary sketches, any feature totally out of scale. A good plan also is to contemplate the passage of the inevitable coffin out of the house, excluding any resort to such drastic methods as taking out the windows, or cutting a trap in floor.

I remember a very practical matron insisting on two labourers carrying a plank along a half-built passage into the mortuary of a Home, in order to satisfy herself of the success of the architect's provision for working round the corners and through the doors. In this connection look after your headroom in those Building Act staircases "enclosed and supported by 9-in. walls." It is surprising how you may be caught out when it comes to carrying up trestle tables, or other long and wide fittings, or furniture. In church work the favourite idea is the pointed door that has a wedge cut out of it because the designer has forgotten to study its revolution in relation to the inner arch. A builder I knew, of some extensive experience of church architecture, was contemplating a lapse in this respect of a certain eminent personage, and his reflection interested me. "Ah," he said, "you would never have caught the late Mr. Pearson like that; no drawing, even of the size of the back of your hand, ever left his office that had not been carefully studied."

Having now somewhat cleared up the preliminaries, we may tackle this main question, What should be the leading quality of a plan?

To answer this, I think we should recognise first of all the existence of different types of plan, and especially the vital distinction between plans that have grown and those which have been, and must be, hammered out at one blow.

This great difference guides us, I think, in the right use of the picturesque—I know that I am treading here on difficult and contentious ground, but on the whole I believe that the great qualities in planning are unity, harmony and subordination arising from logic, order and symmetry.

Nor do I for a moment believe that other than what we know as classical planning is thus excluded, because a close study of apparently utterly irregular plans, conjoined with a knowledge of the requirements, will, I consider, show that those principles are there carried out. The exclusion is of the false picturesque, and the falsely-symmetrical, in both cases chosen for preconceived reasons and not in any way arising from the nature of the case. There is an easy but meaningless symmetry against which you have to be on your guard, a style of planning that has its attractions elsewhere than in the building when erected. Professor Kerr speaks of the beauty of a plan being paper deep.

A plan, however, will not succeed unless the great quality of scale and relations of parts are observed. A grand suite of rooms equal in size, without any centre or climax, will be merely dull, while one of grossly disproportionate apartments will bring ridicule on greatness. The art of combining small and large rooms into a whole is one most worthy of your study.

Hard upon this subject follows the consideration of approach, vista, and climax. Much could be said on all of these if time allowed; on the first, for instance, a whole essay could be devoted to the great question of the relation of architectural grandeur to the human scale, and the limit of exaggeration permissible. I draw your attention to the magnificent grand gallery of Blenheim, occupying an entire wing in plan and section, with the remark that the massive furniture is suggestive of that provided for the dolls' house. Also to the fact that the columns of the façade of St. Peter's, and of those of the portico of the Pantheon, at Rome, of half the scale, are usually judged to be of equal size.

Besides, however, the scale of dimension, there is that of architectural treatment and decoration, and nothing is more painful, I think, than inadequacy in this respect. It is most commonly seen in the glaring contrast of exterior and interior design. A striking instance to my mind is the interior and exterior of Wilkin's fine college in Gower Street, and any number of similar disappointments might be reckoned up.

There is never any harm in specialised features, provided they are not obtained by beggarly meanness in other places. Simplicity of general composition accords well with concentrated richness when the key or ground note of the design is well maintained throughout. It is the shame of the dirt and rags that pours contempt upon the rich waistcoat of the pretentious beggar.

Closely connected is the subject of approach, one more neglected than any other with us. It is strange that it is so rarely noticed that a quite commonplace building may be redeemed by a good approach and setting.

Take as an instance the Madeleine and the Chamber of Deputies in Paris, as united by the Place de la Concorde and the bridge, or observe the effect of the great flight of steps leading up to the Trinita from the Piazza de Spagnia at Rome. In London observe how in the Regency work the genius of Nash produces a certain effect through the laying out, in spite of the utter commonplaceness of the architecture. Not only too in exteriors, but more especially in interiors, is this point lost; for instance, what a loss to the grand interior of St. George's Hall, at Liverpool, is the present use of the lateral entrance from a mere corridor, while the rather unhappy central hall of the Brussels Law Courts impresses the spectator because of the grandeur of the great staircase vestibule that precedes it.

With us considerations of convenience constantly spoil grand effects of this kind; any number of instances exist of large halls entered laterally instead of upon their axes. The great hall of Euston Station is a good instance where this fault has been avoided. One might suggest that we could imitate our own cathedral architects in this respect; for the English lateral entrance porch is a delightful feature in itself, while it is rendered less injurious to the total effect by its position at the extreme end of the side elevation. The whole question of the vestibule and approach is worthy of your most attentive study, and I suggest to you to consider that there is a descent as well as an ascent in scale when you are working out a climax. Of this, two analogies suggest themselves—the Koran shine of a great mosque, and the Holy of Holies of an Egyptian temple.

This paper, you must remember, is intended to draw your attention to the artistic side of planning, and I have already gradually drawn you into the midst of the subject. I suggest you to bear in mind this principle: *In building, section and elevation alone reveal the plan.*

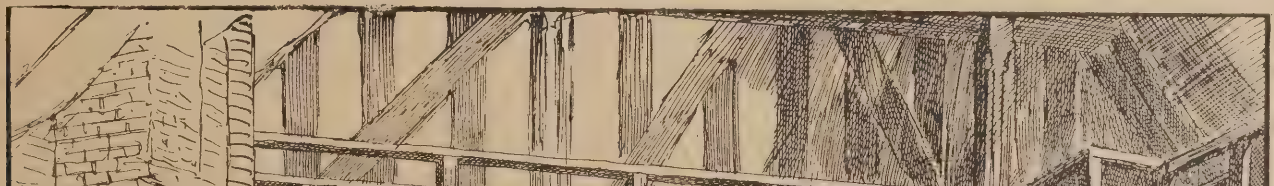
I am certain that if you will as students fully realise the non-existence of the plan, as you have drawn it on paper, you will be greatly helped in your designs. It will change your mental attitude towards plans and planning. You will learn the wisdom of your last-century brethren, who delighted in those quaint drawings, where a plan lies in the centre of four elevations, set up on its boundaries. The $\frac{1}{16}$th and $\frac{1}{8}$th scale studies of your work will consist largely of long sections illustrating the working out of your interiors and their intimate relation to the elevations externally, while a roof plan will be, as it was with Barry, one of the first drawings prepared.

To this add the earliest possible perception of the fact that all architectural effect is dependent on lighting. This is commonly enough remembered for the exterior; but how rare it is to see a well-thought-out scheme of internal lighting! It is not a question of recommending the tricky illumination of some Jesuit church, but of a plea for a reconsideration of the absurd dogma, "You cannot have too much light." Few things are more striking in the Alhambra at Granada than the subtle effect of the distribution of the light, as by the alternation of light and dark bays in the interiors and by other similar means.

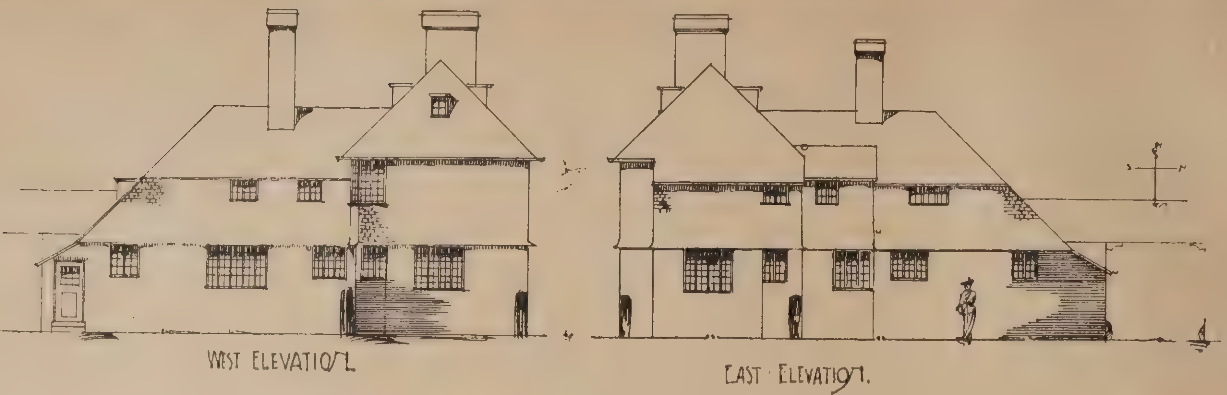
We arrive now at the point where we ought to consider construction as affecting planning. I remember being struck, as a beginner, by the remark of an older student respecting a large modern building that had just been completed in the office. "How interesting," he said, "it would have been if we had had no iron joists and had been obliged to use vaulting everywhere!" The idea was surprising at first sight, as the interior was made up in the main of large rooms, but he maintained that the necessity of providing adequate abutment would have lead to delightful and interesting points of planning and effect.

I do not think there can be any doubt that grandeur in planning is immensely aided by the necessities of monumental construction. In pure planning it is difficult to point to finer examples than the Byzantine, Mediæval, and Renaissance church plans in which the problems of vaults and domes are worked out. It is, perhaps, not easy for us, in such a carpenter's country as England, to realise the extent to which certain styles have originated from the necessities of timberless floors and roofs, but few students would dissociate mediæval work from its characteristic vaulting. I venture, therefore, to strongly advise you, as part of your study of planning, to grapple with the perhaps tedious, but not really abstruse, problems of vaulting. You will find an added interest in your study of old work, and often an unexpected utility in your designs, from an acquaintance with the geometrical principles and methods involved.

One of the questions that was agitated during the Gothic Revival was the legitimacy of cradling, or sham construction, as it was then called. As there has been a return to last-century ideas on this subject on the part of most of us, I assume that the question has been more or less given in favour of the Renaissance rather than the Gothic method. Probably a certain degree of artificiality is inseparable from an advanced civilisation; and if you argue from historic facts rather than from literary theories, it is difficult to prove the proposition that construction has always been rigidly shown. The hollow columns that carried nothing, and the lath and plaster vaults of the Renaissance, were an easy subject of mockery; but the feeling that underlay the use of these features, that of producing a certain effect of beauty is one which lies at the back of all artistic effort. It is a subject of an essay by itself; I only introduce it here to stimulate your thought, and to urge you not to lightly belie your construction, nor, on the other hand, to imagine that a skeleton is necessarily a pleasing object in a drawing-room. The resort to inner ceilings, to the padding-out walls, and other similar means of overcoming otherwise insoluble problems in the proportioning of a complex



ST. STEPHEN'S NATIONAL SCHOOLS, PADDINGTON: IN THE NEW BOYS' SCHOOLROOM, LOOKING EAST.
DRAWN BY F. L. B. GRIGGS. ARTHUR T. BOLTON, ARCHITECT.



GHYLL COTTAGE, GOUDHURST, KENT. ARTHUR T. BOLTON, ARCHITECT.

interior, stands on the same basis as the foregoing. Such things as concealed, or gib, doors, blank windows, and the like, can be far too easily adopted as expedients for economising the time of a planner in a fix.

Probably, apart from monumental planning, the constructive point most likely to come before you in your planning essays is the morality and necessity of observing the ancient law of a "pier over pier and void over void," or its more extended equivalent, the dictum that "walls should follow up," or down as the case may be. I remember hearing an old practitioner inveighing against the methods of a brilliant modern planner in a criticism of a house: "All on false bearings, and you know what that means," was his sharp comment. I fancy steel joists have diminished much of the old feeling on this subject. It was the certain shrinkage of the old timber partition, and the apparently alarming nature of the cracks that followed, that caused such methods to be regarded with so much suspicion. I can only tell you that I have heard, on this question of floors over floors, on excellent authority, that so good a man as the late Mr. Nesfield used to plan out his floors separately, according to the requirements and the aims he had in view, regardless of such considerations, and that then, on arriving at a satisfactory solution of each floor, he pursued a policy of conciliating the differences. Such a method naturally often led to constructive difficulties which were doubtless expensive to overcome. It is, therefore, to some degree a question of cost. You must ask yourself whether the particular point you have in view will thoroughly justify the expense. If, as is very likely to be the case, the answer is in the negative, you must reconsider the whole scheme, so as to arrive at a simpler solution.

As a rule, in a building of more than one floor, circumstances, or your attitude to the problem as a whole, will determine one floor as the master floor; and very often it will be the best to plan out this first, even sometimes down to small points of arrangement, and then to see to what extent the under floors will work to it.

In all country work, or for buildings where grouping is a primary consideration, the roof plan is really the key to the whole matter, and yet how rarely it is that this plan is made out until matters are so far advanced that the worst possible methods have to be resorted to in order to "get over" the necessities of its construction. Knowledge of the simpler problems of intersecting planes is a great help in dealing with roof plans. You may, as you think, come over the facts of geometry in your perspective sketch, and even if your architectural conscience is a slack one, on your ⅛th scale drawings, but science will avenge itself when the building is up. To avoid ruffling up artistic souls I beg to offer you this maxim of philosophy, that "you must obey in order to command," and only by understanding the facts with which you have to deal can you hope to give them that artistic direction at which you are aiming.

The heading of "fads in planning" opens out a delightful field, but we can only cast a glance over it. We all know that ingle nook, staircase, patent service hatch, &c., which have been the bane of our earliest efforts. Gentlemen, those ghosts are not to be laid by the fierce arguments or the most kindly advice of our revered seniors; let them be worked off in a succession of paper designs before we arrive at actual construction.

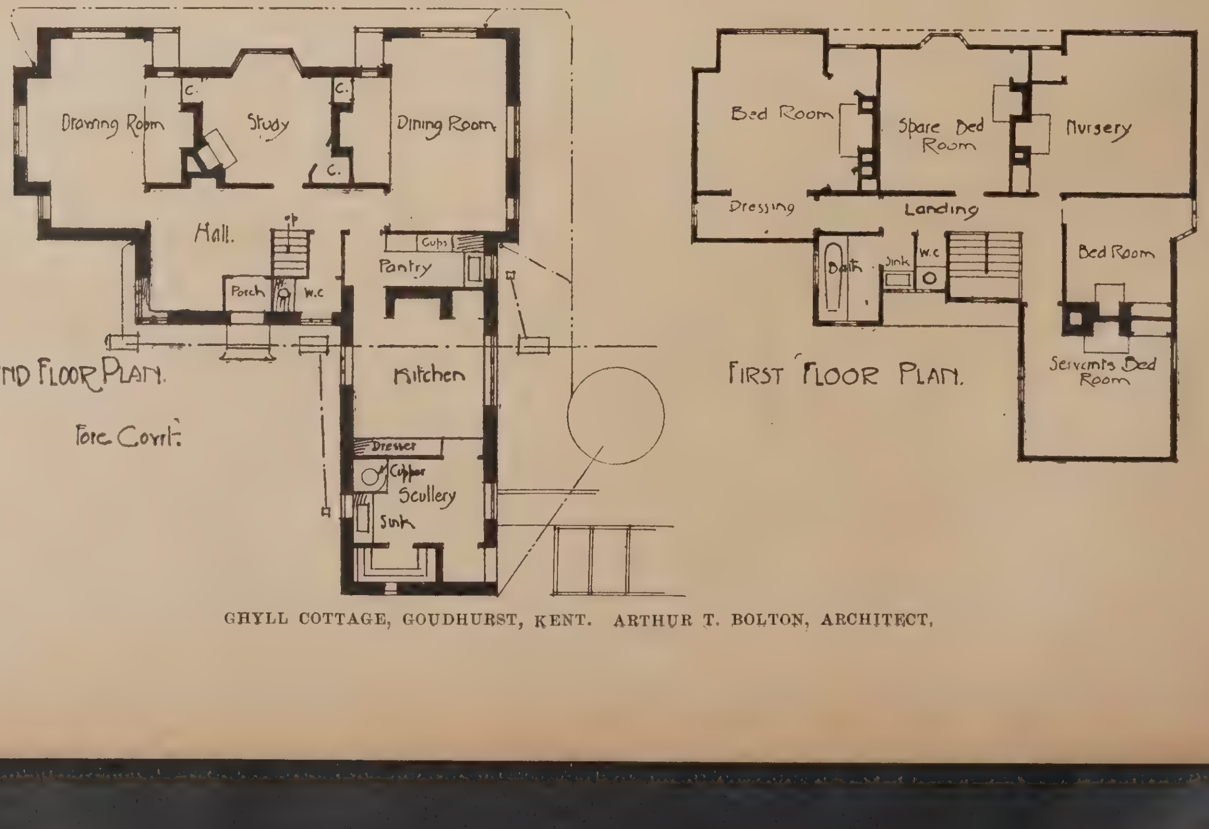
I expect everyone cherishes a special hobby in the nature of a fad. I remember a modern church by a great man to which was attached a hump of a baptistery elegantly labelled by his assistant "a pure example of Mr. So-and-so, of thirty years ago," and I seem to have seen members of whole families of similar features, the outcome of an extensive practice.

I think too that such fads have a respectable antiquity. One might class as great instances many local peculiarities, as, in France, apses and circular stairs, as against square east ends and newel stairs with us, axial as against lateral entrances, &c. For many such peculiarities there were original reasons and traditions at which we can now most often only guess. They are by all means to be respected, and I only mention them here under "fads" in order to warn you against importing such features without reason into unfamiliar places. When this is done they are mere exotics devoid of roots in the soil, and can claim only the interest of those who, by travelling, have acquired a comprehension of their origins and meaning.

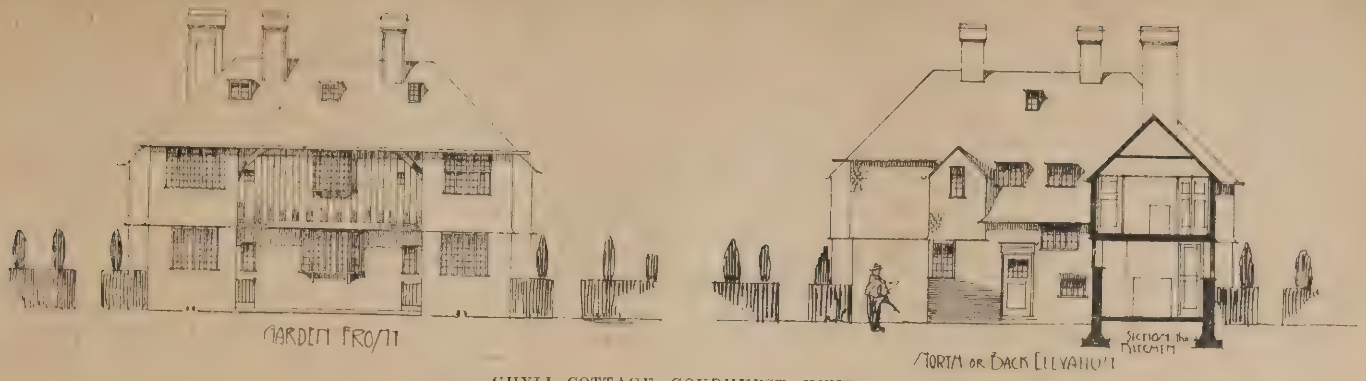
Another kind of fad in planning is the persistence of a feature due originally to some use or ritual that has now become obsolete and has possibly been forgotten. Religious architecture has always, from the earliest days, exhibited numerous instances of this kind. Antiquity has at times given a sacred character to what was at the first only a matter of everyday practice. Fads of this kind are to be handled with great respect, as the links of an ever-lengthening chain that is too precious to be roughly handled. It is needless to excite yourselves, to the point of giving technical explanations, when some too enthusiastic amateur enthuses over the inner meaning of these features of planning.

Not altogether disconnected with the subject of fads is the question of compliance with legislation in planning. Besides the General Acts relating to Building and of Public Health, you ought to have some knowledge of the special regulations that affect various types of buildings through Factory Acts and Education Codes, &c.

Special types of plan are the outcome of such legislation, and until the requirements are altered it will probably be found that such a normal type cannot be safely departed from. This came out clearly in a School Board competition, where all the competitors in vain taxed their inventive powers, being beaten by a scheme closely adhering to the stereotyped plan. If it seems to you that this constitutes an intolerable intrusion of the law into the realms of architecture, I beg you most earnestly to satisfy yourself that the fact is so modern as you believe. I fancy that, on a close study of the facts of old social conditions, you will be surprised to find how much work that you thought to have been done by untrammelled artists was the outcome of obedience to strict regulation. Ask yourself how it is you do not understand offhand the arrangement of, say, some old monastery,

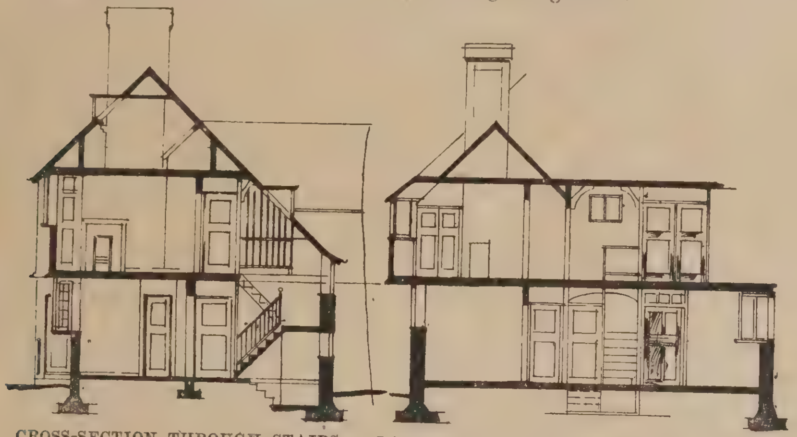


GHYLL COTTAGE, GOUDHURST, KENT. ARTHUR T. BOLTON, ARCHITECT.



GHYLL COTTAGE, GOUDHURST, KENT.

or trace out the effect of the rules of the Cistercian order on monastic architecture, and remember that Imperial Rome had a Building Act as well as London. Such considerations, of course, do not in the least excuse the many vexatious and needless restrictions that architects have so constantly to complain of; they are only suggested so that you may temper your wrath before it leads to the pit of despair. It is needless to resign yourself to inaction on the plea that "the times are out of joint; oh, cursed spite, that I was ever born to set them right," or to adopt the other course of doing anything because nothing matters.



CROSS-SECTION THROUGH STAIRS. PART LONGITUDINAL SECTION THROUGH HALL.
GHYLL COTTAGE, GOUDHURST, KENT.

It will be best for yourself and for architecture if you can find a means to do the very best you can under the circumstances, and we are not entitled to ask you for more.

In the general discussion that followed the reading of the paper several members, including Mr. Doubleday and Mr. C. E. Bateman, took part. The president, Mr. Bidlake, in summing up, remarked that in regard to the point of the section and elevation alone revealing the plan, he had been struck by the extraordinary fact that a few parallel lines of dots in plan could develop into the marvellous interior of a Gothic cathedral.

The Sheffield Society of Architects held its annual meeting last week. Messrs. J. R. Wigfull and J. B. Mitchell-Withers having been elected fellows of the Society, the balance sheet and annual report were passed. It was decided to send to the Royal Institute of British Architects a copy of a resolution that the competition for the late Queen's memorial should have been open to the whole of the British Empire. The following officers were elected: President, Mr. P. Marshall; vice-president, Mr. T. Winder; treasurer, Mr. F. Fowler; members of the council: Messrs. J. R. Wigfull, R. W. Fowler, C. Hadfield, J. R. Mitchell-Withers, E. M. Gibbs, H. L. Patterson (fellows), C. B. Flockton, C. F. Innocent, and C. M. Hadfield (associated members). On the ground that the council needed the infusion of new blood Mr. Gibbs would not accept office, and the vacancy thus created was filled by Mr. E. Holmes. The President handed over to Messrs. H. W. Inott and J. Miller the society's prizes, and Mr. Joseph Smith announced that in future the society would have a home of its own, arrangements having been made to take a room in the building of the Literary and Philosophical Society.

PROTECTION OF BUILDINGS AGAINST LIGHTNING.

A RESEARCH COMMITTEE.

A COMMITTEE, to be known as the Lightning Research Committee, has been organised by the Council of the Royal Institute of British Architects and the Council of the Surveyors' Institution, with the object of collecting and tabulating information from all parts of the country as to damage resulting to buildings from lightning-stroke.

The committee owes its inception to Mr. Killingworth Hedges, who, in his paper on "The Protection of Public Buildings from Lightning," read before the Institute and reported in our issue for April 25th, 1900, referred to the difficulty experienced by experts in getting accurate information as to injuries sustained by lightning struck buildings, and urged the desirability of an enquiry by a recognised authoritative body as to how far buildings are rendered lightning-proof by modern systems of protection.

The present enquiry, by the collection of precise data, may serve to test in some measure the results accruing from the rules laid down by the Lightning-Rod Conference nearly twenty years ago.

The committee is constituted as follows: Chairman, Mr. John Slater; Major-General E. R. Festing (Victoria and Albert Museum, South Kensington), Mr. J. Gavey (assistant engineer-in-chief, General Post Office), Mr. W. P. Goulding, Dr. Oliver Lodge (Birmingham University), Mr. W. N. Shaw (Royal Meteorological Society), Mr. H. Heathcote Statham, Mr. A. R. Stenning, Mr. Arthur Vernon and Mr. Killingworth Hedges (hon. secretary).

In pursuance of their enquiry the committee seek the co-operation of competent observers in all parts of the country, with a view to obtaining accurate details, noted on the spot, of the effect of lightning-strokes on buildings, whether fitted with conductors or not. The committee have held three meetings, and a schedule of questions is in preparation and will shortly be issued.

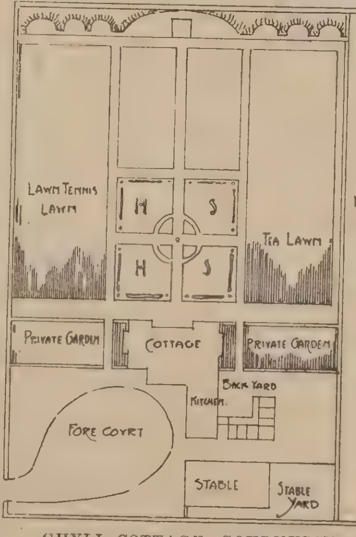
The following is the kind of information required:—Description and situation of building struck, height above sea-level, position with regard to other buildings and high trees, and propinquity to wells; whether rain was falling at the time—if not, whether rain preceded or followed the stroke, and at what interval; as to the number of lightning-rods on the building, giving position, height above roof, material (both of rod and staples), shape, sectional area, how finished at top and at bottom, condition after flash, &c.; whether conductor was continuous; particulars of earth-connection; when conductor was last examined and tested; nature of soil; the precise nature of the injury to the building; if any portion was set on fire; damage to metal-work, such as bells, rainwater and other pipes, electric bells or telephones; distance from conductor of portion of building affected; materials of roof-coverings, and position of gutters and down-pipes; whether conductor was in contact with any other metal; particulars as to metal-cresting, weather-cocks, finials, or flag-staffs on the building, stating distance from and height above conductor; if conductor was struck, whether damaged portions can be obtained for examination, &c.

Members and others willing to assist the Committee by their observations are requested to communicate with the Secretary of the Committee, at the offices of the Institute, 9, Conduit Street, W.

Surveying and Sanitary Notes.

"The Scientific Roll" is a most useful magazine of systematised notes, issued periodically. Number two, on Bacteria, has just been published, price 1s., and gives a list of the bibliography appertaining to the subject, with a record of the facts dealt with.

The Proposed Bacteriological Institute for Dublin is meeting with the support of the Irish public bodies. It is thought that it should be a national one, supported by all the public institutions and sanitary authorities in the country. We understand it is proposed to establish in Dublin a Pathological Institute in connection with all the lunatic asylums in Ireland. As the work of such an institute will be mainly bacteriological, the Dublin Corporation Public Health Committee think that one institute will suffice.



GHYLL COTTAGE, GOUDHURST, KENT: SITE AND GARDEN PLAN.

INTERIOR OF PADDINGTON PUBLIC BATHS, QUEEN'S ROAD, W.

Law Cases.

Respecting a Brick-Kiln.—Messrs. Joseph Morton, Limited, of Siddall, were recently summoned at the Halifax Police Court for erecting a brick-kiln at Cinderhills without having first submitted plans to the Corporation. The defence was that the kiln was "used exclusively in connection with the working of a mine," and therefore exempted under clause E of by-law 2. The case, which occupied the Court several hours, turned wholly upon the construction of such exempting clause. Mr. Tordoff, Assistant Town Clerk, said that the point was this: Was this kiln used for something connected with the getting of clay out of the soil? He submitted that it was obvious on the face of it that it had nothing whatever to do with it. The clay, after being got from the mine, was not taken directly to the kiln; it had to undergo a variety of processes before being burned in the bakery or kiln. Mr. Walter Storey, in defence, urged that the mine, in which was coal as well as clay, could not be worked at a profit unless they had the kiln close to—and therefore in connection with—the working of the mine. The Bench were unable to agree, and the case has to be re-heard. The re-hearing has been fixed for May 14th.

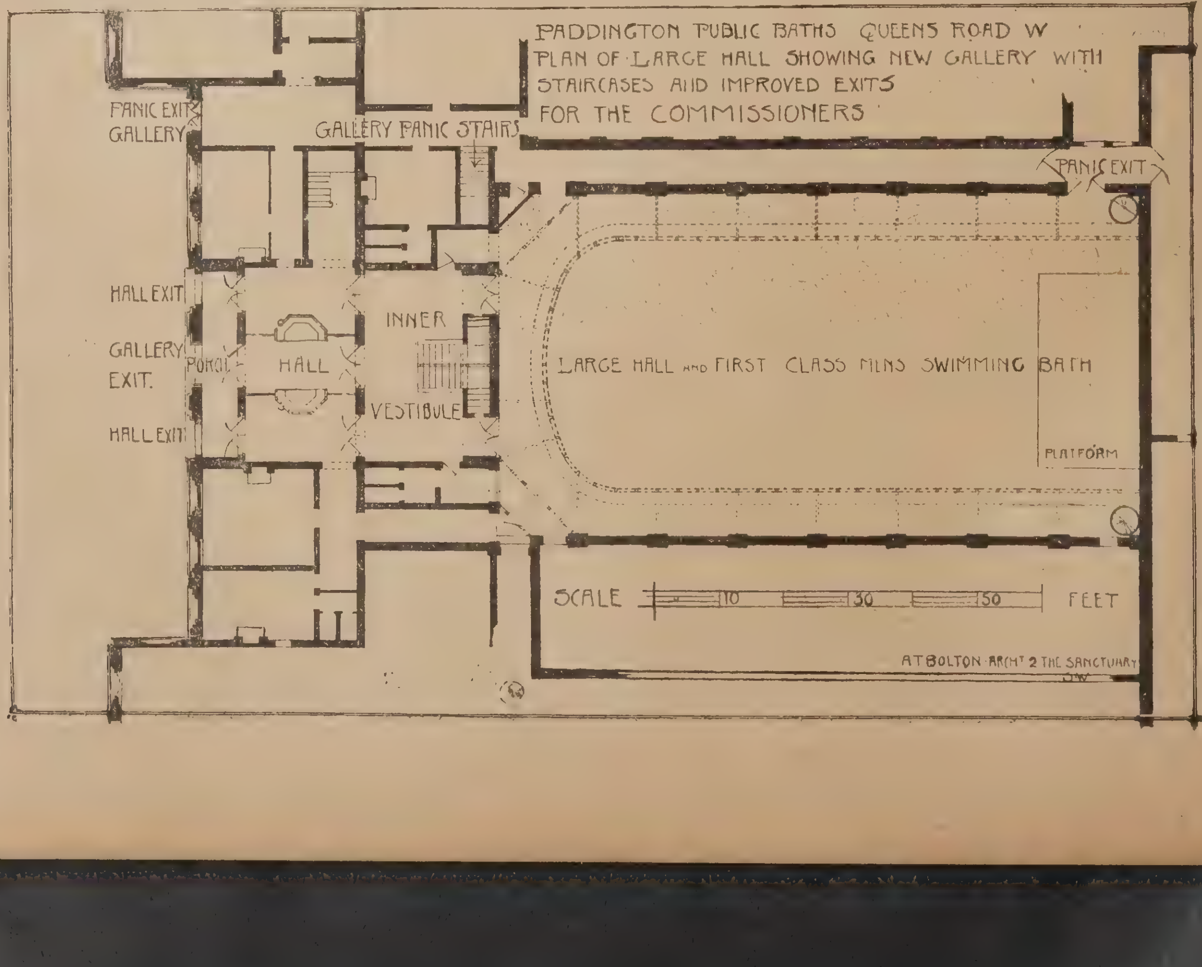
The Definition of a "Dangerous" Building.—At the Manchester County Police Court on April 4th Mr. J. M. Yates, K.C., the stipendiary magistrate, gave the decision of the Bench in the case of the *Swinton and Pendlebury Urban District Council* v. *Watson, Woodhead and Wagstaffe*, brewers. Two days before, Mr. Postlethwaite, the clerk to the Council, applied to the Bench for an order, under section 32 of the Housing of the Working Classes Act, 1890, to close the British Queen Inn, North Dean Street, Pendlebury, on the ground that it was in a state so dangerous or injurious to health as to be unfit for habitation. One of the walls was 13in. out of the perpendicular, and another fronting Dean Street was 7in. out; some of the cross walls were broken and bent, and one of the floors was 18in. lower at one end than the other. It was contended for the defendants that the Act did not apply to houses such as this, and that, if it did, that "dangerous" meant dangerous in a sanitary sense. Mr. Yates said that the definition of a "dwelling-house" in the interpretation clause defined it to be any inhabited building, and included the site. It was impossible to say that this was not an inhabited building, and it was not for them to limit the wide definition of the Act. Then, did "dangerous" mean in a sanitary sense? The section of the Act did not so limit it, but it said "dangerous, or injurious to health," and they thought the section meant to deal with two sorts of property—one that was dangerous, and one that was injurious to health. It was clear that, if unoccupied, the sanitary condition of this house would not be likely to affect the inhabitants, but its dangerous condition might well do so. The Bench ordered the house to be closed. A case was granted.

A Building Trade Dispute: Picketing.—A case arising out of the building trade dispute in Belfast was investigated at the local Police Court on April 9th. An action was brought by an alleged "blackleg" named M'Gimpsey against a striker named Maguire. The plaintiff said that he was beset and intimidated while at work, and after he left off was hooted by a crowd of strikers, of which the defendant appeared to be the ringleader. On April 1st the defendant had also been arrested for disorderly conduct in the street. Mr. Hodder, the stipendiary magistrate, in fining the defendant £5, said that had it not been the first case he would have inflicted a long term of imprisonment.

Bombay's Consulting Architect.—The India Office have chosen Mr. John Begg, A.R.I.B.A., for the position of Consulting Architect to the Government of Bombay from two applicants selected by Mr. William Emerson, President R.I.B.A.

The Statue to the late Most Rev. Lord Plunket Protestant Archbishop of Dublin, which has been executed by Mr. W. Hamo Thorneycroft, R.A., was unveiled yesterday in Kildare Place, Dublin.

Catalogue Art. — Messrs. Spottiswoode & Company, Limited, printers, of New Street Square, E.C., have just issued a catalogue giving specimens of the work they are doing in producing trade catalogues. The production of these articles is worthy of a greater amount of consideration than is usually bestowed upon it. Although considerable sums are at present spent in printed catalogues, the standard remains very low, and it is certain that if manufacturers were to give the matter into the hands of a firm such as Messrs. Spottiswoode, who lay themselves out for artistic work, benefit would be derived by all concerned. This firm are prepared to undertake the complete production of any class of catalogues, and are prepared to submit sketches, suggestions, specimens, and estimates free. The catalogue under review shows how attractive these necessities for the manufacturer and merchant may be made, and we advise everyone who is thinking of having a catalogue printed to write for a copy of this one; the advice given in the introduction is good, but the setting of the type shows the very easy mistake of having too much red ink on a page, and also of putting splotchy initial letters in the middle, thus destroying all balance of type in the page.


PADDINGTON PUBLIC BATHS QUEENS ROAD W
PLAN OF LARGE HALL SHOWING NEW GALLERY WITH STAIRCASES AND IMPROVED EXITS FOR THE COMMISSIONERS
PANIC EXIT GALLERY
GALLERY PANIC STAIRS
PANIC EXIT
HALL EXIT
GALLERY EXIT.
PORCH
HALL
INNER
VESTIBULE
HALL EXIT
LARGE HALL AND FIRST CLASS MENS SWIMMING BATH
PLATFORM
SCALE 10 30 50 FEET
A T BOLTON ARCHT 2 THE SANCTUARY SW

QUEEN VICTORIA MEMORIAL.

THE VIEWS OF LEADING MEN.

THE BUILDERS' JOURNAL was almost the first to publicly decry the decision of the official committee to restrict the competitors for the Queen Victoria Memorial, and we are glad to see that this decision is meeting with increasing disapproval in the daily press. The "Daily Chronicle" especially has devoted considerable space to the matter.

Mr. Norman Shaw's Opinion.

To a representative of the "Chronicle" Mr. Shaw said he felt that, reviewed from a national standpoint, the Executive Committee had carried out its work in a most unsatisfactory manner. The selection, which he took to be the result of the committee's labour, was but a compromise at best. First of all, the committee appeared to have selected three Englishmen. Then, in order to allay national jealousy, they threw in a Scotsman and an Irishman. Mr. Shaw foresaw endless trouble and confusion for the committee, who had not gone to work the right way. He considered it would have been much better if the competition had been an open one. Then a jury of specialists could decide which was the best design. As it was, who was going to sit in judgment upon the designs to be submitted by the gentlemen chosen by the committee; and how were they to know that any of the work would prove worthy of so great an occasion? It would be necessary, he considered, for a body of experts to report upon all the designs, and this body should be empowered to reject them all if they fell below a certain standard of excellence.

"English architects of to-day know nothing of monumental work," said Mr. Shaw. "This is perhaps because they have done so little of it. That little has been done badly. In this respect there is a vast difference between ourselves and the French and the Germans. Our best work is domestic architecture, theirs monumental. In the hands of people who could design the Arc de Triomphe and the magnificent votive church at Montmartre, such a work as the Victoria Memorial would be perfectly safe. With every respect for the five architects chosen, I must say that they know as little of monumental work as anyone in the profession, although Dr. Rowand Anderson did some splendid work when he designed Edinburgh University."

Asked what he considered a suitable form for the proposed memorial, Mr. Shaw said he thought that the object the committee had in view might be achieved by the erection of a new facade to Buckingham Palace, and the incorporating with it of a suitable statue of her late Majesty. This (re-naming the palace "Victoria") would be a memorial, useful, stately and ornamental.

What Mr. Charles Holme thinks.

Mr. Charles Holme, the editor of the "Studio," says: "That this great national memorial should be placed in the hands of any small group of men, no matter of whom composed, must seem a grievous error to all who have an extended practical acquaintance with the working and results of open competitions.

"The scheme devised by the council should in the first instance be made widely known, and the whole profession of architects invited to submit preliminary plans and sketches. A selection of the more suitable designs received should then be exhibited. It is by no means certain that the men whose names are the most generally recognised will produce the most worthy and acceptable projects.

"Great Britain at the present time is remarkably strong in the possession of a brilliant generation of young and rising architects, sculptors and decorators. Let these lesser-known workers have an opportunity of showing their capabilities. It is admitted throughout Europe that, had their productions been adequately exhibited at the World's Fair in Paris last year, we should not, as a nation, have suffered the humiliation of being ranked as low as we were in the scale of artistic merit."

Mr. Onslow Ford's Idea.

Mr. Onslow Ford suggested to a "Chronicle" representative that "a good way of carrying out the scheme would have been for the committee in charge to appoint a sub-committee of the sculptors belonging to the Royal Academy. The sculptors would have had power to call in an architect, as chairman, we shall say, and a scheme would have been worked out by collective effort."

The Views of Mr. Pelcher and Mr. Flockhart.

Mr. John Belcher is of opinion that it would have been well if the design had been open to competition. "But it is possible—and the point is not to be overlooked—that this would have kept out some well-known men. What I mean is that, as very busy men, they might not have cared to enter upon a purely speculative task. But, even allowing for that argument, I think the present list is rather limited. Indeed, if I may so, I fancy that the selection of one architect, like Mr. Norman Shaw, would have given greater satisfaction to the profession."

Mr. William Flockhart holds a similar view.

Mr. G. F. Bodley makes a Suggestion.

Mr. G. F. Bodley, in a letter to "The Times," thinks that the memorial should rise out of the lake in St. James's Park. "Not, however, isolated, but connected with either bank by a bridge of a sufficient but not too great a width. This should have light and graceful arches. At either end of this bridge-road there could be a flight of steps and an archway with statuary and heraldic bearings and bronze gates. Statues might also be placed on the piers of the arches of the bridge. In the centre the memorial would rise four-square or octagonal, its base rising from the water. The lower part could be of red or grey granite, and the whole of the superstructure of white marble, with bronze statuary. It could be made a beautiful object in a beautiful situation."

Mr. Haité's Opinion.

In the course of an interview with a "Daily Chronicle" representative, Mr. George C. Haité, president of the Society of Designers, said he doubted if an architect was the best qualified designer of a national monument. His work lay more in the planning and building of habitations and business premises than in designing national memorials. Such work, Mr. Haité thought, would be much better carried out by the architect working in conjunction with the artist-designer and the sculptor; for a memorial called for artistic conception and treatment of design. In order to enable the representative men of the kingdom to compete if they desired, Mr. Haité would have the final selection of the design left to a committee consisting of French, German, Italian, and American architects.

Mr. D. S. McColl's Views.

Mr. D. S. McColl holds such a high place as an art critic that his remarks on this subject are particularly valuable. In the "Saturday Review," referring to the five selected architects, he says: "If these five gentlemen are chosen, at least twenty more have a right to feel aggrieved at being excluded.

"Mr. Jackson is a man of learning and taste, whose work at Oxford was much more sympathetic with its surroundings than the disfiguring additions by earlier hands. His vein has been a little overworked, perhaps, but it is conceivable that his ingenuity and taste, concentrated on this project, might produce a pleasing monument. His might very well be one of a dozen names.

"Mr. Aston Webb is an able organiser of buildings, whom no one, probably, would call a great artist. His hands and those of his staff must be full with the additions to the South Kensington Museum, and the kind of ability displayed in those additions is not what is wanted for so special a monument as the memorial.

"Mr. Ernest George is a still more surprising choice in so limited a number. His mind is that of the picturesque sketcher rather than of the monumental architect. He has enlivened certain London quarters with reminiscences of foreign travel, but the signature of a native architectural character is always missing.

"The remaining names on the list reveal the compromising committee-mind that has drawn it up. Three names have been chosen from England, therefore one must be thrown in from Ireland, and one from Scotland. Sir Thomas Drew's work is little known in England; Dr. Rowand Anderson is of the able organising type, and has attracted a good deal of talent to his office; but clearly these two names were put down as official heads of the profession in the two countries to give a look of impartiality all round.

"If I have fairly stated the claims of the five competitors, it will be clear that the scheme is an unsatisfactory official compromise between two ways of doing the thing. No one would complain if one of the first-rate artists in the profession had been chosen and given the commission to make the best of. Thus I am convinced that every artist in the kingdom would have acquiesced if Mr. Norman Shaw had been invited to undertake the project . . . But such a decision would require in our rulers both taste and the courage of taste, and they have neither. It is better certainly not to have the courage without the taste, as is the case with the German Emperor, imperiously loading the earth at Berlin with his idea of heroic statues. But not very much better is the decision reported, which amounts to an advertisement of want of conviction.

The Great Genius of Alfred Stevens.

"Sir William Harcourt the other day repeated a familiar refrain about the wretched character of our public monuments. He forgot that we have one superb monument, and that obtained in public competition. It was obtained more by luck than judgment, it is true. Others gained the premiums, and the design of Stevens finally came to the front because it turned out to be the only one that fitted under the arch. Our luck trembled, it will be seen, on a precarious chance, but there always is that chance, the probability that talent will win at one point if not at another, and escape, by sheer efficiency, all the guards of stupidity.

"There is another reason, apart from the final choice of a designer, in favour of such a competition. A memorial like this stirs the imagine ation, and nothing would put more life into the schools of architecture and sculpture than emulous effort centred on such a monument, and crystallising the theories and tentatives that are groping for a style. It is quite conceivable that one of our younger architects might strike out a memorable design, certain that the effort on all sides, as in the old fresco competitions for the Houses of Parliament, would be quickening and educational.

"Nothing has been said so far of the choice of a sculptor. Here the committee are credited with a single choice, that of Mr. Brock. Mr. Brock will certainly do nothing offensive; his work will be preferable, in a negative way, to the photographic and arts and crafts fashions in sculpture; but he will as certainly do nothing inspired. There have been two memorable designs for a statue of Queen Victoria. One was the project by Alfred Stevens for a monument of the Great Exhibition. It can be seen at South Kensington. If this had been carried out the Queen would have had a monument indeed, and it is to be wished that some sculptor of the needful modesty and ability should even yet take it in hand. I recommend the idea to committees up and down the country. The group of continents that encircles the pedestal is a ready symbol of empire, and the younger Queen might stand for history's and the sculptor's sake. The other monument was Mr. Alfred Gilbert's at Winchester. Some demon plays havoc with many of Mr. Gilbert's designs, but this was a royal one. Is it incredible that England should throw up yet another sculptor; and was it not worth while searching for him? Nothing is more superfluous than middling sculpture on monumental architecture, and I argue in the hope that the reported scheme is not authentic or finally determined on. It would be too stupid to close all loopholes against genius."

The "Times" supports the Committee.

In a leader on the Memorial the "Times" expresses the opinion that "whatever may be the ultimate design, a memorial which is to be a worthy symbol of a nation's affection, the durable testimony of its sorrow. cannot be dealt with as if it were a contract for the supply of forage or the erection of barracks. It is found in practice that the best artists hold aloof from such competitions. They prefer to go their own way, and do not care to take the risks of a competition in which their merit may not be recognised. However carefully constructed may be the tribunal of adjudication, it is notorious that a design with certain obtrusive, perhaps tricky, qualities has a better chance than another which will be permanently more satisfactory as a work of art. Out of such a contest comes something respectable and mediocre, something costly and showy, but rarely anything better. And, then, what tribunal likely to be trusted by the multitude of competitors could be formed? The chances are that it would only escape the charge of favouritism by incurring that of incompetence . . .

"Unfortunately, there is no great choice of sculptors. We are often told that at last their art is flourishing among us, and that in a few years we may look to seeing a score of men fit to be entrusted with any national work. But . . . it generally happens, when a statute interesting to the whole nation is required, that only one or two are available, and that the result is indifferent."

Mr. Lionel Cust on Sculpture.

Mr. Lionel Cust writes to the "Times" in reply to their leader, "which seems somewhat unduly pessimistic in its view of the condition of the sculptor's art in this country at the present day.

"The art of sculpture has had a chequered existence in this country, and there have been times when it has nearly perished from inanition or from the outrageous demands made upon it by its so-called patrons. At the Royal Academy Exhibition the sculptor's art is relegated to a room by itself, where the decorative qualities of the art so essential to its existence are hardly to be perceived.

"It is, perhaps, scarcely known to the general public that of all the arts that of the sculptor is the most costly to the actual artist. A sculptor cannot afford to carry out large works in marble and bronze on the mere change of their finding a purchaser. He is compelled to wait for commissions, and cannot afford to neglect any opportunity for exercising his art in a profitable way. Hence it comes about that anything of an original nature in a work of sculpture is seldom produced in this country, where the æsthetic and decorative aspect of the art is ignored in favour of the merely monumental.

"At the present day there is in this country a school of sculptors, capable of producing artistic work, which can compete with any school of sculptors on the Continent, or, indeed, anywhere, within the last 150 years. They only lack opportunity and encouragement. If the public demand monumental statues of gentlemen in frock coats standing on drums or packing-cases, our sculptors must supply them, for otherwise they might fail to earn a livelihood. But, be they Phidias, Michelangelo, or, Rodin, they can but produce one result — that of inartistic monotony.

"The proposed scheme for the National Memorial to Queen Victoria affords an opportunity to our sculptors which has never occurred before. That the central group, or figure, should have been entrusted to Mr. Brock, R.A., is intelligible to all who are acquainted not only with that sculptor's work but with the esteem in which he is held by his brother artists.

"Should, however, the funds contributed enable the committee to decorate not only the new square, or piazza, but also the new road through the Mall with groups of sculpture, it can be said with the utmost confidence that for each group required there could be found at the present moment a separate sculptor capable, if unfettered by circumstances, of producing a work worthy to rank among the great achievements of the sculptor's art."

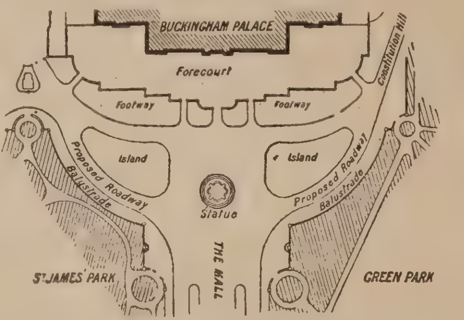
An Advocate for Two Competitions.

Mr. A. H. Skipworth says: "The utilising of a statue already (as I understand) executed suggests the second-hand lumber-shop. The national monument is apparently to be a design created specially to enshrine this piece of sculpture. Such a course is likely to considerably hamper the competing architect, who will find himself absolutely tied down to a certain sized figure for the all-important and central feature of his creation. It seems to me that there should be two competitions. The first open to all, and the second confined to a limited selection from the first. Each architect in the second to be paid for his services; and at the very least five competent assessors, the names of these to be published with the conditions. It is unfortunate, however, that, owing to various causes, competitions at the present time are not favourably looked upon by architects."

Let the Architects and Sculptor Resign.

The art critic of the "Chronicle" remarks that "all the talk last week among artists and architects, in private as in public, was on the subject of the Queen Victoria Memorial. Even little informal indignation meetings are reported to have been held, from which something may yet be heard. The almost universal opinion, expressed in private as in public, is that the committee have made a hopeless blunder. The present scheme has been met with such widespread and earnest protest that if the committee refuse to reconsider it, the only possible course left would be for the five architects and one sculptor to resign a commission finding favour with no one, and themselves propose a competition open to all British artists. They could do nothing that would make them more popular."

The "Daily Telegraph" published last week a plan showing the arrangement (? authentic) of the Buckingham Palace site. This we reproduce. It is not the official one; but it certainly seems to embody the chief proposals, and is therefore of considerable interest at this time.



Mr. William Woodward.

In a letter to the "Times" Mr. William Woodward has not a word to say against either of the five gentlemen nominated as architects, nor against the capable and distinguished sculptor who has been named, "but surely there can be no reason why all British architects should not be permitted to send in drawings and models to be considered by a competent committee of taste. The five architects have had no opportunity whatever in the past to show any particular aptitude for the character of design now required—which is quite outside ordinary building design—and it would be interesting to know how it came about that the committee were able to place their fingers upon the chosen few.

"Personally I feel the disappointment great, because for the last fifteen years . . . I have shown the opportunities which exist in London to make it a beautiful city, and more particularly have I devoted my attention to the opening of the Mall to Charing Cross and the laying out of Trafalgar Square as a public garden.

"On March 11th last I forwarded to Lord Esher a complete design for dealing with the Mall next Charing Cross and with Trafalgar Square as a fitting memorial to Queen Victoria, and that design I shall now publish."

A Recollection and a Hint.

Commenting on this letter, Mr. Richard Edgcumbe recollects incidents in connection with the carrying out of Mr. Disraeli's proposal to erect a national memorial in honour of Lord Byron. "More than a quarter of a century has elapsed since, by orders of my committe, I invited sculptors from all parts of Europe and from America to compete for what must, after all, be considered a small matter by comparison with this proposal fittingly to commemorate the personal character and achievements of Queen Victoria and one of the greatest chapters of English history.

"In response to the appeal made by the Byron Memorial Committee, under the advice of three or four celebrated sculptors—who, of course, did not themselves compete—sketch models arrived from every corner of Europe. Artists, in fact, of every nationality gave us an example of their plastic conceptions . . . Two public competitions took place . . . The result in both cases was so unsatisfactory that the committee, in order to save a further waste of time and money, felt bound to elect the best among the submitted models—with what result may be seen by anyone who passes along the railings of Hamilton Gardens!

"As a matter of fact, these public competitions are futile. If one could divest the artist's mind of a suspicion that favouritism will, somehow or other, operate in the ultimate selection of a design (no easy matter), there would still remain the feeling that his work will be judged by persons having preconceived notions as to the form which the memorial should assume. Under these circumstances a competitor feels the greatest possible restraint in carrying out his own conception, fearful (and not without cause) that the best work will be set aside by incompetent or prejudiced persons in favour of a design more in harmony with their peculiar notions of appropriateness."

Two Names Omitted.

Another correspondent of the "Chronicle" expresses great surprise that the name of Mr. Norman Shaw should have been omitted from the list of selected architects: "It is amazing to read one of your correspondents quoting Sir William Harcourt on the architecture of our British monuments, for it was Sir William who said that he could not see the difference between New Scotland Yard and the neighbouring soap-works. It is of course possible that Mr. Norman Shaw is reserved for the assessor's committee.

"Another name one would have liked to see is Mr. H. Wilson's. Mr. Wilson's work is not perhaps so familiar to the public, although for years he has monopolised the place of honour in the Royal Academy architectural room. To those who know his work, his wonderful control of sculptural and colour schemes, his masterly handling of the details (misealled ornament), especially in the weaving-in of naturalistic and symbolic forms, would have commended him as the first person to design a monument requiring in its designer just these artistic faculties."

Small Sketch Models.

Mr. James Begg suggests that the committee should invite artists to send in designs, accompanied by small sketch models.

"The jury should then select a few of the most meritorious designs sent in, and invite the successful artists to again submit their ideas in a more complete form, granting them at the same time sufficient money to cover the cost of preparing complete models and working drawings."

A Molehill—not a Mountain.—Last week the fact leaked out into the daily press that a short time ago a column in Westminster Abbey fell and was broken. First of all it was "a pillar at least 18ft. in length," and if one had no other information than that produced under the pen of a "descriptive" reporter in search of sensational "copy," one would be led to think that the interior of the Abbey was in a very parlous state—might fall in perhaps—and bury the reporter! But the pillar became smaller and shorter, and eventually, when the actual fact was ascertained, it proved to be an ornamental window shaft of Purbeck marble, 3in. in diameter and 5ft. long, in the chapel of St. John. In falling, the shaft smashed some hot-water pipes and damaged the tomb of Sir Henry Norris. There is, of course, no danger of the Abbey collapsing, though it is only to be expected that ornamental features of this kind—being, by their very nature, delicate and fragile—will not last for all time. The foundations of the Abbey are sound, and the interior is inspected and examined regularly, so there is little fear of a collapse. Too much attention has been directed to this trivial incident. It is perhaps opportune to mention that the Abbey will be closed for three months, in order that the preparations for the Coronation ceremony may be carried out. These preparations include the casing-in with wood of the pillars, in order that they may not be injured by the great crowd that will assemble there to witness the crowning of their King. The Abbey was closed for two months in connection with the Jubilee of 1887.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Concrete in which Nails can be Driven.

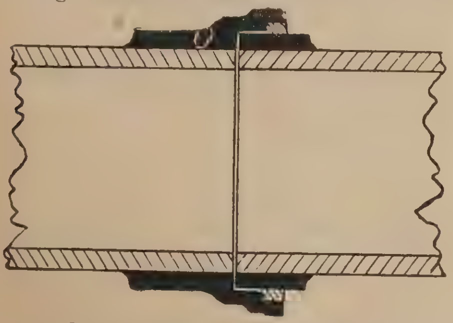
NOTTINGHAM.—QUERIST writes : "What are the proper proportions for mixing coke-breeze and Portland cement so that nails can be driven in for fixing joinery ? "

The proportions vary according to the nature of the coke-breeze. 1 part of Portland cement to 5 of a hard breeze and 1 part of Portland cement to 7 of a soft breeze gives good results. If there is time for the mass to set before being moved from the moulds the addition of an extra 2 parts of breeze, soft or hard, may be safely used. The breeze should be crushed before use. W. MILLAR.

Laying Sewer in Water-logged Ground.

GUILDFORD.—BUONOPARTE writes : "A sewer is to be laid at a depth of 11ft. in water-logged ground (water within 4ft. of surface) and running sand. How can this best be done ? Stoneware pipes with Hassell's joints have been recommended on 6in. of cement-concrete ; others, afraid of the sand and water, propose Shone's ejectors. The line of sewer proposed is near the river, in a low part of town, where the water gravitates from the hills around. Which method would you recommend for adoption ? Would £1 per yard run be a fair price for the stoneware pipes sewer ?"

In designing a sewerage system for a town situated in a flat low-lying district with water-logged subsoil, it is frequently advantageous to adopt Shone's or Adam's well-known arrangement for raising sewage to higher levels at various points. If, however, only an isolated or inconsiderable length of sewer requires to be laid in wet and treacherous ground, then it is generally advisable to incur the extra expense of overcoming the difficulty, rather than make provision for a heavy annual charge in the maintenance of sewage lifts. When laying drains in water-logged ground, sump-holes should be formed at intervals along the trenches, from which the water may be removed by pumping. Sometimes before putting in the concrete bed a line of small diameter drain-pipes is laid from the sump-hole along the bottom of the trench, so that the water-level may be kept below the invert of the sewer whilst the pipes are being laid. In very soft and yielding ground a 6in. concrete bed is usually found to be inadequate to secure a firm foundation. For situations where much ground-water is met with we should recommend cast-iron pipes with turned and bored joints. Recently we had occasion to construct a line of sewer through quicksand at a depth of 18ft. from the surface, the ground being completely water-logged and necessitating heavy steam pumping. Efforts were first made to carry the sewer on a 12in. concrete bed laid on 3in. planking spiked to longitudinal bearers, but without success. Eventually cast-iron pipes, with turned and bored joints, were supported on cast-iron screw piles, screwed into the quicksand at the bottom of the trench. The pipes were arranged with three strong bolt-lugs cast on each end, so that a perfectly tight joint was ensured by securely bolting the pipes together. Drains having Ernest Smith's patent iron joint for stoneware pipes are also readily laid in wet ground (see sketch). These drain pipes consist of butt-ended glazed stoneware pipes, having a light iron spigot and socket securely cemented to the ends of the stoneware. When placed in position, the pipes are quite concentrical, and the joint is made watertight by caulking a strip of solid-drawn blue lead into the annular space between the spigot and collar. Lead strips of the proper length and thickness are provided with the pipes, whilst the pipes themselves are made in 3ft., 3ft. 6in., and 4ft. lengths. For stoneware pipes which are required to be laid in wet trenches, Hassell's patent double-lined joint is one of the best that can be adopted. A price of 17s. to 20s. represents the average cost of constructing ordinary sewers, including manholes, &c., complete ; but for sewers laid in difficult ground, where continual pumping or additional foundations would be necessary, the price must be increased by 25 to 100 per cent., according to the local conditions. T. E. C.



Model By-laws and Party Wall.

GUILDFORD.—BUONOPARTE writes : "The Model By-laws allow the insertion of no plate, block, or plug of wood in a party wall ; *i.e.*, in cases of lean-to back offices and rooms of dwellings two distinct plates will be required. How can the top of the wall be covered satisfactorily ? No ridge tile is sufficiently broad to efficiently protect wall rafters and slates."

All party walls should be carried up *above* the adjoining roofs, and finished with a brick-on-edge or stone coping. The joint between the wall and the slate or other roof covering should then be finished on each side with lead flashings in the usual manner, so that the roofs on both sides, the party wall may be quite watertight.

T. E. C.

Book on Honours Building Construction.

BIRMINGHAM.—A. F. Z. writes : "Kindly name one or two books on Honours Building Construction. I want if possible to get a cheaper book than Rivington's, which is 21s."

"Building Construction (Advanced and Honours Courses)," by Charles F. Mitchell, price 4s. 6d., is a good book. It is published by Mr. B. T. Batsford, of 94, High Holborn, W.C.

Book on Wren's Towers.

DERBY.—VOLUTE writes : "Where can I obtain a book illustrating Wren's towers ? I remember seeing such a book several years ago—a small one, with illustrations and hardly any letterpress—and I believe that the title was 'Wren's Towers ?' "

"Wren : The Towers and Steeples designed by Sir Christopher Wren," by A. T. Taylor, A.R.I.B.A. (price 3s. 9d.), is probably the book you mean. It can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Sanitary Institute and Examinations.

PAISLEY.—W. L. writes : "What books would you recommend for study for the examination of the Sanitary Institute for sanitary inspectors ? Also, when are the examinations held ?"

Apply to the Secretary, Sanitary Institute, Parke's Museum, Margaret Street, W.

Little Stanmore Church.

BOLTON.—TWOPENCE A WEEK writes: "Please state where I can obtain a description of the old brick church at Stanmore. There is also a vault inside the ruins, I believe, about which I should like some information."

The church of St. Lawrence at Little Stanmore was, with the exception of the tower, built about 1715, and, while vaguely said to be in the "Italian" style, is probably of the English Renaissance which was in vogue at the time, and which was that of the later years of Wren's lifetime, the *true* "Queen Anne." Several well-known artists seem to have been employed to decorate the church, including Antonio Verrio, Belluchi, Laguerre, the carver Grinling Gibbons, and his father-in-law, the iron-worker. The organ was also built in Queen Anne's reign by Father Schmidt, and was re-built and enlarged in 1878 ; but some of the carving on the case is the work of Grinling Gibbons. The mortuary chapel (probably the vault referred to in the query) was also decorated with wall paintings by Verrio. G. A. T. M.

Latin in R.I.B.A. Preliminary Examinations.

SOMERSET.—R.E.G.A., writes : "Kindly name the book from which the Latin sentences set in the R.I.B.A. Preliminary Examinations are taken. It appears to me that they are taken from Æsop's Fables."

Speculation as to where examination questions are taken from, is most unwise. More failures result from "cramming" of this sort than from any other cause, for the examiner has the whip-hand of the examinee, and can readily circumvent the man who has merely crammed a few likely pieces of translation. The only proper course to adopt is to master the Latin language sufficiently to be able to translate simple prose at sight—a feat which should be within the capacity of any fourth-form boy from any public school. G. A. T. M.

Books for S.K. Examinations.

LLANELLY.—STUDENT writes : "Kindly mention some books suitable for study in the following subjects held at South Kensington (Art Department) : Architecture, Architectural Design, Principle of Ornament and Historic Ornament. Do you consider that in studying the above in preparation for the May examination, 1902, I should have too much in hand ? "

The "History of Architecture," by the late Banister Fletcher and B. F. Fletcher, is a useful summary, but you ought to read Fergusson's work. For ornament, study Meyer's "Handbook of Ornament" (10s.), Dolmetsch's "Historic Styles of Ornament" (25s.), and Mr. Walter Crane's "Bases of Design" (18s). Architectural design cannot be learnt from books ; you should study old buildings and new ones by acknowledged masters, and read Ruskin's "Seven Lamps of Architecture" (7s. 6d. nett), Viollet le Duc's "Dictionnaire Raisonné de l'Architecture," and "Stones of Venice" (3 vols., 10s. nett). These books can be obtained from Mr. B. T. Batsford, 94, High Holborn, W.C. There should be time for you to study these for the 1902 examination.

Timber Marks.

PLYMOUTH.—G. A. writes : "(1) Where can I obtain full information of the current marks (or brands) on imported timber ? Is there such a paper as the 'Timber Trades' Journal' list of shipping marks ? If so, kindly inform me where to obtain it, and the price. (2) What is the usual method of setting out a building, after bottoms are out ? Should the measurement be taken by rod or tape ? "

(1) The "Timber Trades' Journal" list of shipping marks on sawn and planed wood exported from Sweden, Norway, Finland, Russia, and Germany is published by Messrs. William Rider & Son., Limited, of 14, Bartholomew Close, E.C., price 6s. (2) With regard to setting-out a building after the foundations are put in, start at one corner and build up a few bricks, then measure off the length of one wall carefully to the next corner, a rod being preferable to a tape. Build up a few more bricks, using a large set-square made by nailing two pieces of board together, with a cross-piece to keep them in position, and level with the first corner. Proceed in this way round the building ; the corners having been built up, the bricklayers can stick in their pins and lines, and proceed merrily.

Building Trade in New Zealand.

HEXHAM.—D. S. writes : "In what issue of the BUILDERS' JOURNAL did an article appear on the building trade in New Zealand ? "

An article on "Architectural Art in New Zealand," by Mr. S. Hurst Seager, A.R.I.B.A., appeared in the R.I.B.A. Journal for September 29th, 1900, and particulars of the state of labour in the building trades in that country will be found in our "Masters and Men" column this week.

Books on Italian Renaissance Architecture.

BURNLEY.—STUDENT writes : "What books are required for the study of Italian Renaissance architecture, and what are the characteristics of the Roman and Venetian Schools ? "

"Architecture of the Renaissance in Italy," by W. J. Anderson (price 12s. 6d. nett), and Ruskin's "Stones of Venice." (3 vols., price 10s. nett), will give you the information you require.

Bricks and Mortar.

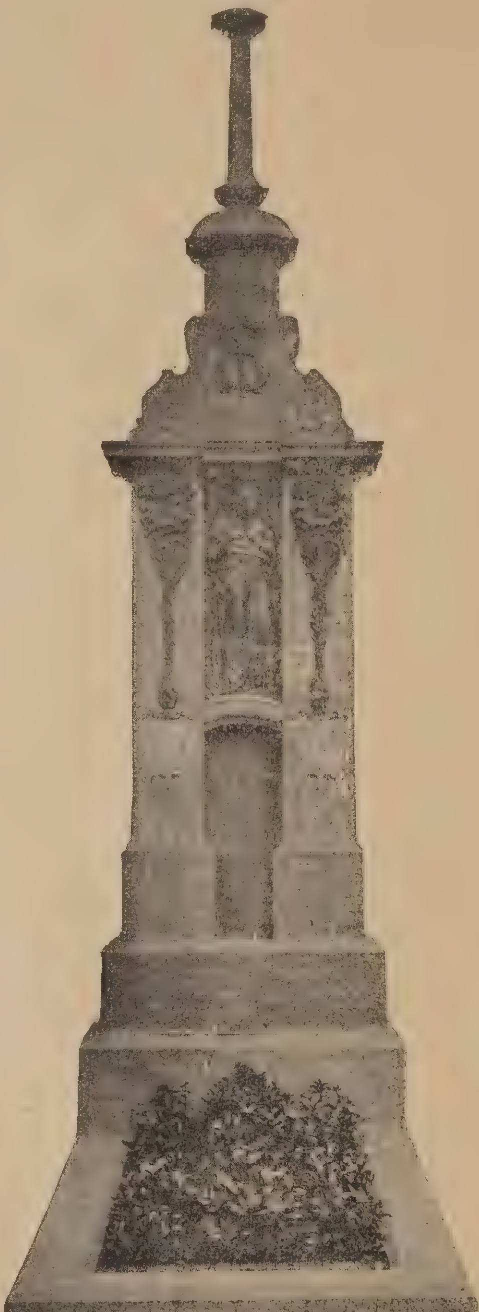
APHORISM FOR THE WEEK.

It is a general law, of singular importance in the present day, a law of simple common-sense, not to decorate things belonging to purposes of active and occupied life. Wherever you can rest, there decorate; where rest is forbidden, so is beauty.—RUSKIN.

Our Plates. GREYFRIARS CHURCH, Aberdeen, is to be pulled down, though this decision has not been arrived at without a great deal of opposition on the part of the University, the Presbytery, the Ecclesiological Society of Aberdeen, Sir George Reid, and Mr Whyte (the architect of the University tower). But, willy-nilly, the Philistines have decided to demolish it; and so goes a fine specimen of Gothic architecture. Particulars of the church will be found on page 156 of our issue for April 3rd last.—Oxford Place Chapel, Leeds, which is situated in an important public position near the Leeds Town Hall, is not an entirely new building, but is a reconstruction of an old square, barn-like structure which had occupied the site for about a century. The work consists of a new front and side elevation, as seen in the perspective view, and a large amount of remodelling in the interior, together with new seating, stained glass windows, and colour decoration. The tower and the remainder of the building to the right have not yet been built, but it is intended to commence this portion of the work in the course of a few months. The chapel is faced with red bricks from Messrs. Woolley's brickyards, with stone dressings, the stone being obtained from the Wroso Hill quarries, near Shipley. Oxford Place Sunday-school took the place of an old school which was previously pulled down. It is situated at the rear of the chapel, and fronts to Oxford Row. The new building was put up prior to the restoration of the chapel. The interior accommodation comprises a series of class rooms and vestries, and a large assembly hall on the first floor, with direct communication with the chapel. These two buildings at Leeds were carried out from the joint designs of Mr. G. F. Danby and William H. Thorp, F.R.I.B.A., both of Leeds.

A Derelict Church in Central London. RATHER more than a year ago the condition of St. Mary's Church, Soho, was pitiable in the extreme. Its ancient nave, built for the use of the Greek colony in 1677, had been destroyed by the London County Council in 1898 as a "dangerous structure." Shapeless and roofless, the nave lay a veritable heap of stones. The lofty chancel, the foundation stone of which was laid in 1872, was in a sad state of dirt and neglect, though its walls were intact. The church has now been restored. £4,568 has already been raised, and the new nave is now built. But a further sum of £2,232 is still required to enable the church to be re-opened free from debt. Contributions should be sent to either of the treasurers to the St. Mary's, Soho, Restoration Fund—Mr. T. F. Blackwell, J.P., 21, Soho Square, W.; the Rev. J. H. Cardwell, St. Anne's Rectory, 28, Soho Square, W.

Leadless Glaze. "A MANUFACTURER," writing to "The Times" upon the proposed new regulations of the Home Office, is of the opinion that if they are insisted upon the "potting trade" of this country will be absolutely ruined. He says: "Most of the leading firms have complied with all the regulations laid down from time to time in the last few years; but there are scores of small and struggling factories, which in the aggregate employ thousands of hands, who cannot afford and have not the means of carrying out all the requirements of the Home Office. My firm is quite willing to place at the disposal of any manufacturer their "leadless glaze" receipt, for which they were awarded a gold medal by the Society of Arts in 1820, but I fear few, if any, would be willing to avail themselves of it; not only because of the extra expense of using same, but the absolute certainty of the impracticability of applying it to their present body of ware; moreover, I have no hesitation in saying if they made the attempt the result would be disastrous. It therefore means that if the Home Office insist upon all potteries using a "leadless glaze" a very large proportion of the small and struggling firms will either have to alter the body of the ware, so as to withstand the very high temperature necessary to properly fuse the hard (leadless) glaze now suggested, or else close their works. The latter, I fear, will be the ultimate result in the majority of cases, as to do what is necessary to accomplish the above means heavy additional expense in adapting existing kilns to this hard firing, besides the extra expense of better and more coal for the longer and harder firing necessary."



MEMORIAL, BROMPTON CEMETERY. H. FULLER CLARK, ARCHITECT. BRONZEWORK MODELLED BY FREDERICK W. POMEROY.

Mr. Birrell on Cathedral Screens. MR. AUGUSTINE BIRRELL expresses himself on a variety of topics. The latest is that of cathedral screens. Describing Cologne Cathedral in the "Century Magazine," he says "that when you have passed through the western doors into the nave you can scarcely restrain your cheers. No miserable partition, no ill-placed organ, mars your view of the splendid proportions of the edifice you have just entered. Your eye runs with joy up the avenue of pillars, past the shadows of the transepts, enters the choir, and reverently beholds the steps of the altar, and is rewarded by the rich hues of the eastern window—and all in a moment of time! In how many of our English cathedrals is the eye robbed of this rich harvest! Too often one enters with a groan instead of with a shout of praise. An open screen of ironwork 12ft. from the ground is all that is required to divide the choir from the body of the church. It should be made a *præmunire* without benefit of clergy to allow any other partition to remain in any cathedral for more than three months after the publication of this number of the 'Century Magazine.'"

A Memorial. THE memorial illustrated on this page has been erected in Brompton Cemetery, and is of plain grey "Alloa" granite, bronze and copper. The bronze lilies at either side of the central panel have scrolls entwined in the stems, on which are inscribed the words "Alpha" and "Omega." The finial is in copper. The granite work was carried out by Messrs. Fenning & Co., of Salters' Hall Court, E.C., and the modelling of the bronzework by Mr. Frederick W. Pomeroy, of Wentworth Studios, Chelsea. Mr. H. Fuller Clark, of John Street, Bedford Row, was the architect.

Woodcroft Castle. THE Old Manor House, called Woodcroft Castle, an historic pile dating from the thirteenth century, stands a short distance on the left (or west) of the main line of the Great Northern Railway, about five miles north of Peterborough. Until recently the castle was in comparative seclusion, being almost entirely hidden from view by the surrounding trees. These have now been removed, and the time-worn structure, with its fine old mullioned windows and its famous round tower, stand fully revealed to the passer-by. The building is attributed to the latter part of the thirteenth century, and the existence of small square trefoiled windows leads one to suppose that the construction took place under foreign supervision. The round tower has, it is supposed, been utilised as a prison, as there was no access thereto from the interior of the castle. Woodcroft is seven miles from Stamford, and about one mile from Helpstone, where John Clare, the peasant poet, lies buried.

An Old London Inn. THE relics of the old coaching days seem fast disappearing in our London streets. Holborn, that once gloried in a wealth of old-time houses and taverns, is now filled with glaring gin palaces and shop premises, on their glass tank ground-floor fronts, all of outrageous design. The announcement is now made that the last of the ancient inns of Holborn, the Black Bull, is to come down. The Black Bull and its neighbour, the Old Bell (now a new erection) claim to date from the middle of the seventeenth century. It is difficult to trace the exact date of the building of either of these hostelries, but both figure in a list of courts, rentes, and inns published in "A New View of London" in 1708. The Black Bull as it stands to-day is but a shadow of its former self. The quaint old galleried building which overlooked the courtyard was some years ago converted into tenements for poor people, which have now been vacated in preparation for the coming demolition. The Black Bull, if not famous in fact, is renowned in fiction. Dickens's readers will remember that it was at the Bull Inn in Holborn that Mrs. Gamp and Betsy Prig nursed Mr. Lewsome—"Nussed together, turn and turn about, one off, one on." How different from the house as the immortal "Sairey" found it, is the Bull of to-day! We should look in vain for the "intricate passages" through which the chambermaid led her to the top of the house. The chamber where the patient lay, we are told, was at the end of a gallery, and looking from the window of this room, which she found "a little dull, but not so bad as it might be," Mrs. Gamp was "glad to see a parapidge, in case of fire, and lots of roofs and chimney-pots to walk upon." The furniture of the apartment was not so much to her liking, and she complained of the easy chair that it was "harder than a brickbadge." It is to be hoped that the sign of the bull pawing imaginary ground over the entrance to the courtyard will be preserved in the Guildhall Museum.

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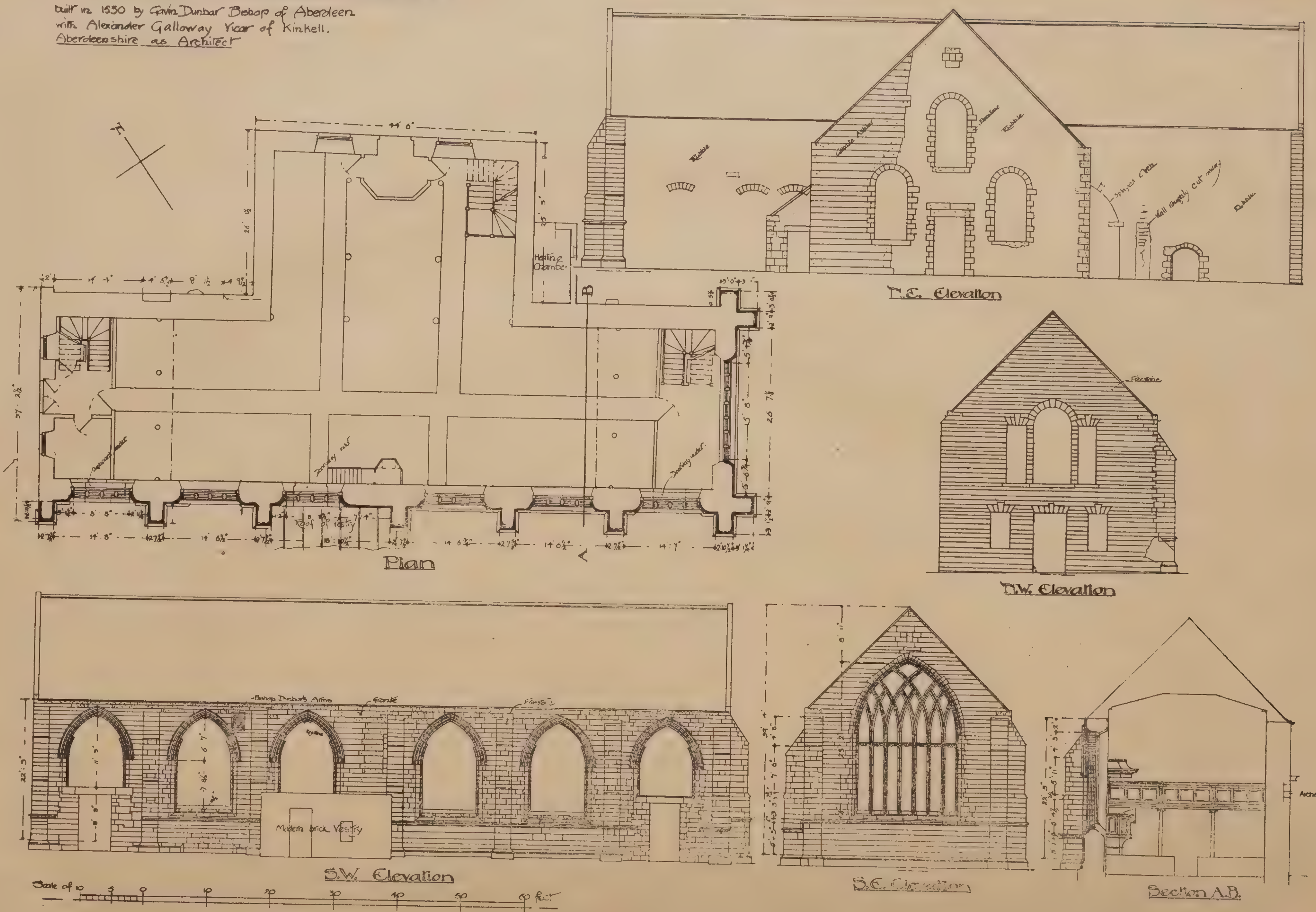
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, April 17th, 1901.

GREYFRIARS CHURCH ABERDEEN

built in 1530 by Gavin Dunbar Bishop of Aberdeen
with Alexander Galloway Vicar of Kinkell,
Aberdeenshire as Architect



Measured and Drawn by A. G. R. Mackenzie

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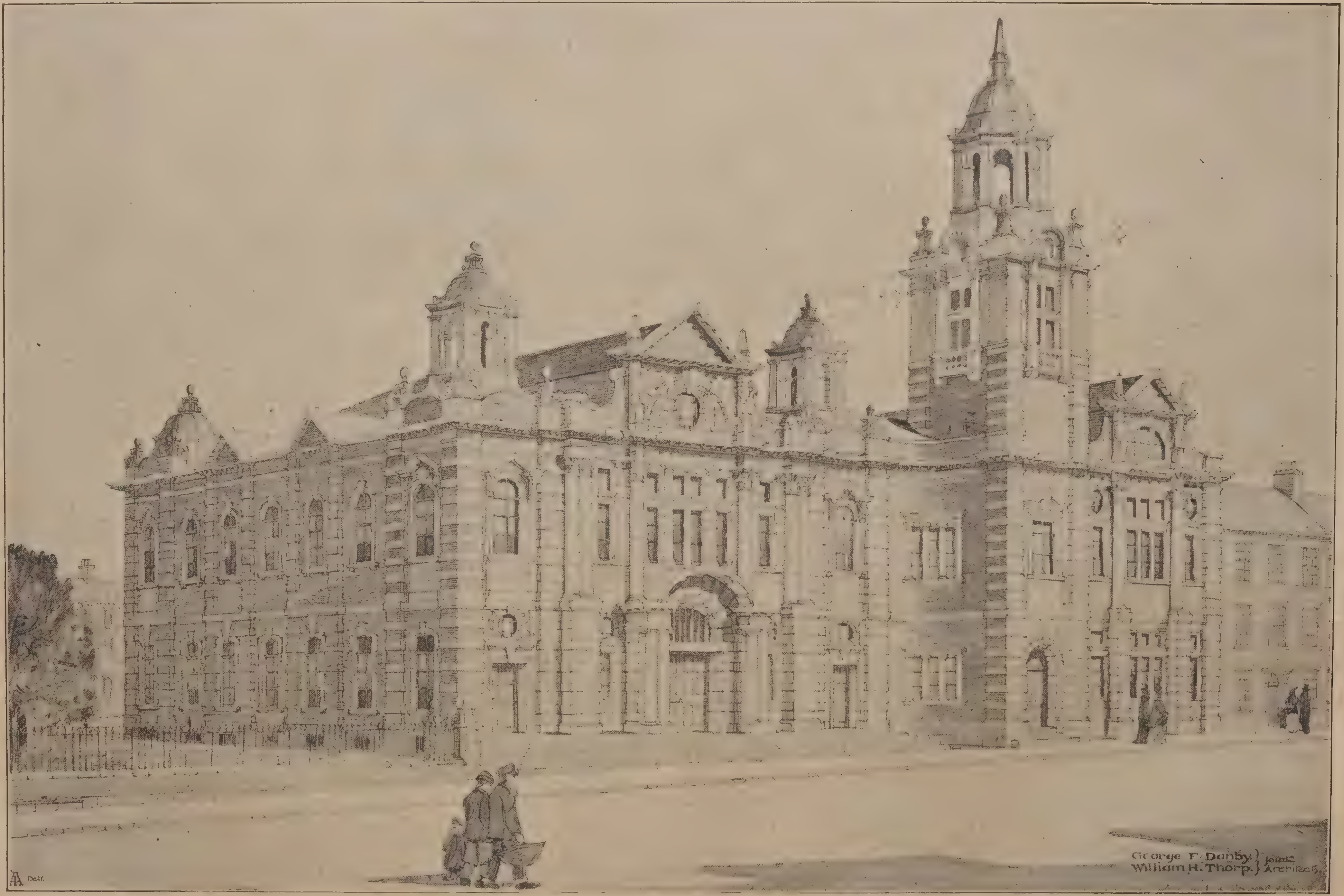

RECONSTRUCTION OF OXFORD PLACE CHAPEL, LEEDS. GEORGE F. DANBY and WILLIAM H. THORP, Architects.

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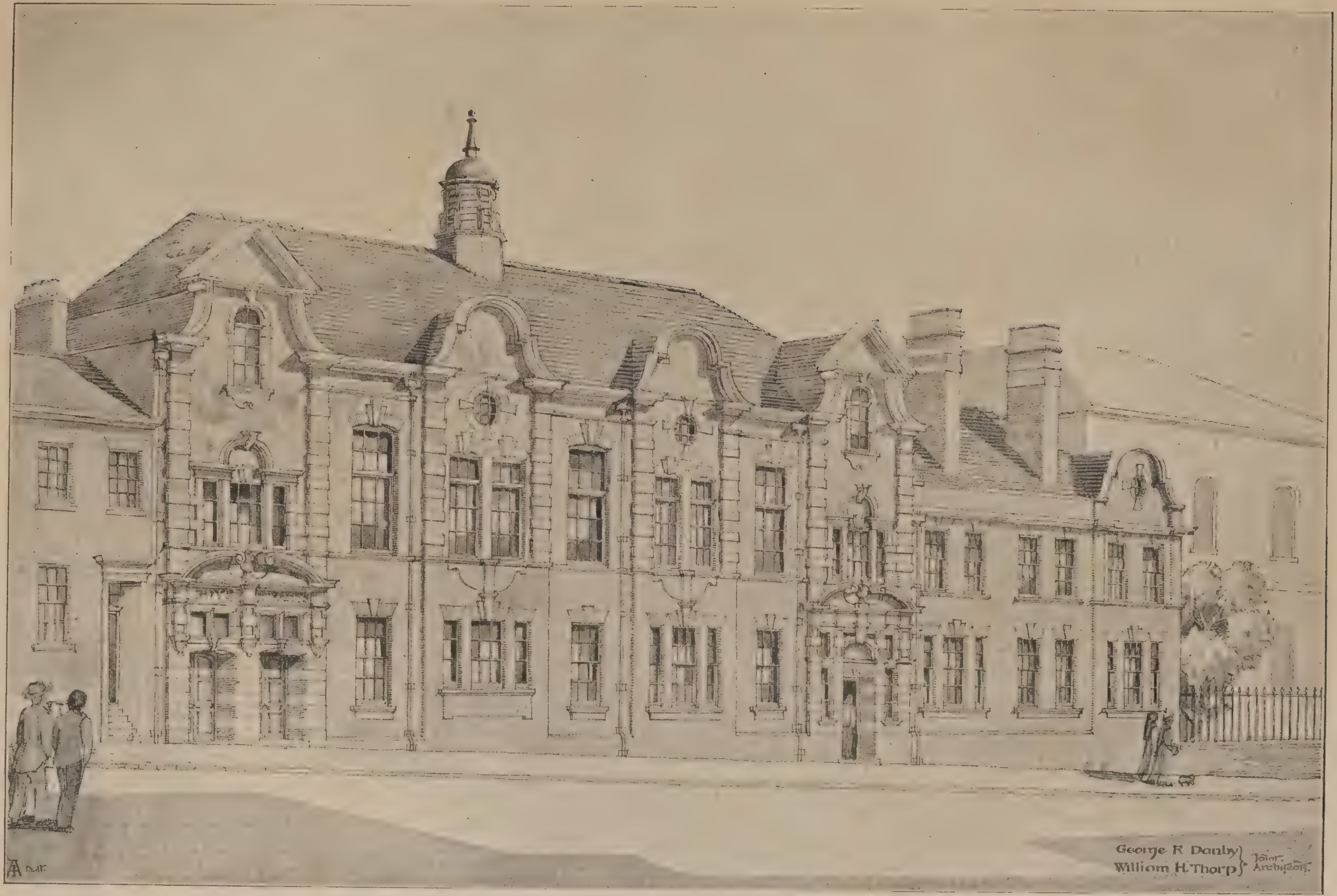

NEW WESLEYAN SCHOOL, OXFORD PLACE, LEEDS. George F. Danby and William H. Thorp, Architects.

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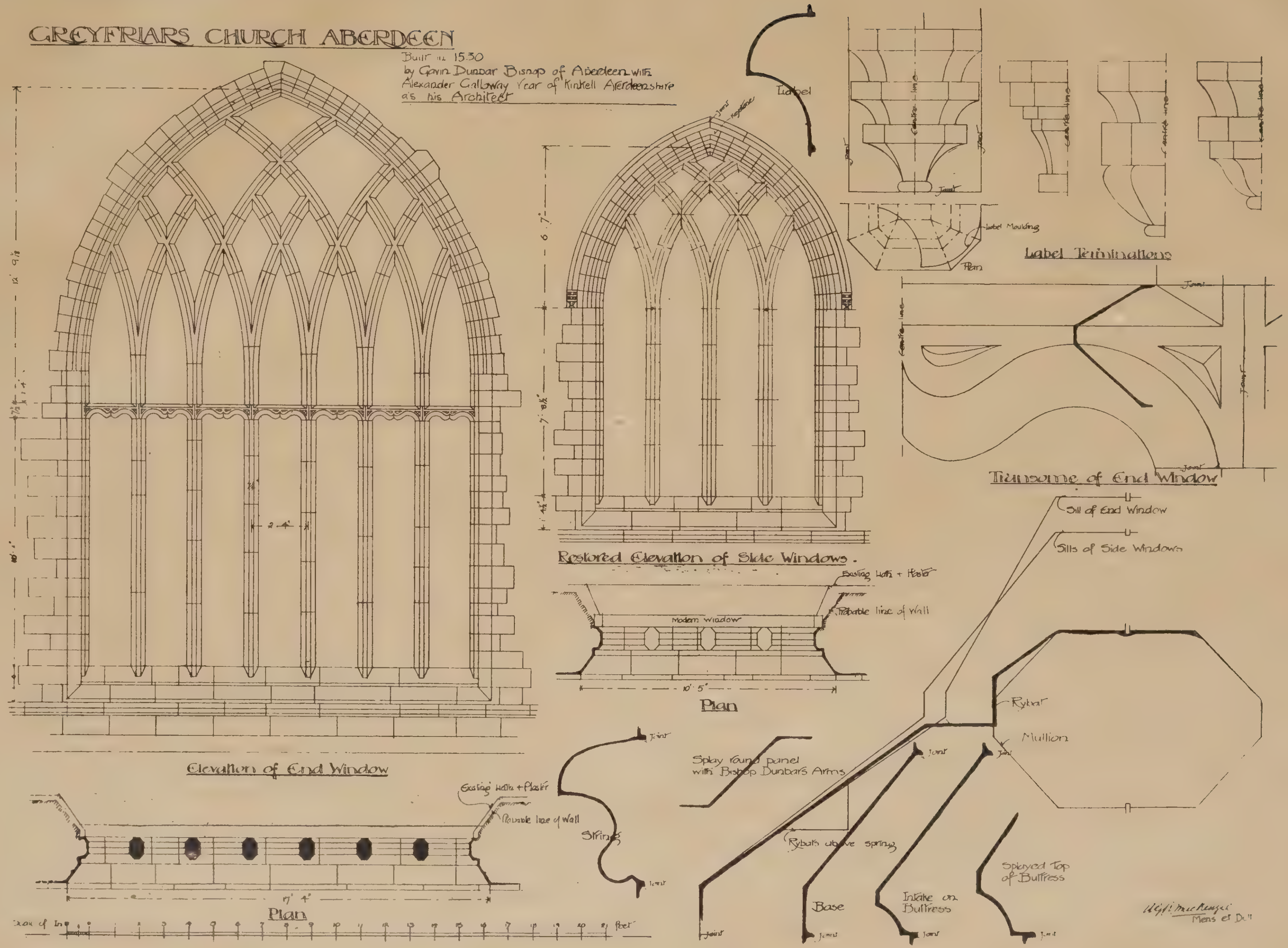

Measured and Drawn by A. G. R. Mackenzie.

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Builders' Notes.

Change of Address.—The testing station of the British Fire Prevention Committee has changed its location from North Bank, Regent's Park, to Westbourne Lodge, 66, Porchester Road, Bayswater, W., to which address communications for the Resident Engineer, should be sent.

A Scaffold Accident resulting in injury to seven men occurred at Birmingham last week. The men were engaged at a high building in Eyre Street, when the structure bearing them suddenly gave way and they were thrown to the ground, a distance of 30ft. Four of them were taken to the hospital in a critical condition, and one died there not long after admittance, his skull having been fractured.

The Building Trade at Chester-le-Street.—Whatever may be the case in other districts, there is no likelihood of any dulness in the building trade around Chester-le Street for the coming season. On three extensive estates dwelling-houses and shops are already in course of erection in Chester-le-Street itself, while at Grange Villa Mr. C. Groves is rapidly enlarging the amount of habitable property. A new Primitive Methodist chapel to cost something like £2,000 is to be commenced with almost immediately at the north end of Chester-le-Street, and a large house to the south of the present Primitive Methodist school. Immediately opposite this a new and enlarged Mechanics' Institute is to be built. The old hostelry known as the Lambton Arms is also to be rebuilt, and the Joiners' Arms is to a certain extent be to reconstructed. An improved theatre and a workmen's club are also contemplated. Further afield a new Co-operative Society is to be erected at Birtley.

Masters and Men.

The Norwich painters belonging to the Union in accordance with a month's notice to their employers, are now out on strike for an increase of wages, from 6d. to 7½*d.* per hour, and alterations to the existing working laws.

The Harrogate Plasterers have Struck against a proposed reduction of wages. When the building trade was remarkably brisk a year or two ago, the wages reached 10½d. per hour, and the masters now propose tc reduce them to 9½d. per hour, a similar rate being paid in other Yorkshire towns.

The Strike of Cement Workers at Stroud is at an end, an amicable arrangement having been come to. Parts of both sections of the factories at Frindsbury have been reopened, and about 200 men have resumed work. The rest of the hands required are to be taken on gradually until the whole of the works are again in full swing, but a month will probably elapse before this has been accomplished.

The Arbroath Joiners have Struck. It appears that the dispute arose in connection with the signing of the by-laws. It is customary for the societies connected with the joiners to give the employers three months' notice regarding the constitution of their rules, and during that time the masters are expected to sign their approval to the same. The specified time having expired, the men accordingly resolved not to resume work. Between thirty and forty men are idle.

Labour in the Colonies.—The April circulars of the Emigrants' Information Office and the new annual editions of the penny handbooks show the present prospects of emigration. This is the best season of the year for emigration to Canada. There is a fair demand for general labourers, and for certain mechanics, such as carpenters, blacksmiths, and iron and steel workers. In New South Wales, at Lithgow, there is a demand for carpenters and painters. There is a demand in parts of the colony for men in the building trades, especially plumbers. In Victoria there is practically no demand for more mechanics or labourers, unless they are specially skilled, and bring a little money with them. In South Australia and Tasmania the local supply of labour is mostly sufficient. Owing to drought and scarcity of employment in Queensland, emigrants are not recommended to go there at present unless they receive nominated passages, or take a little money with them. The report of the Government Labour Bureau in Western Australia for 1900 states that, generally speaking, there has been full employment for all classes of workmen throughout the year. Building operations have been brisk, and carpenters, masons, plasterers, &c., have been in demand at Fremantle. Timber-workers have also been wanted in parts. Unskilled labour was better employed than in the year before, and first-class labourers found no difficulty in obtaining regular employment at good wages. The last reports show that there was plenty of work in New Zealand. In Auckland there is good employment for bricklayers, carpenters, and general labourers; a fair demand for plasterers, painters, and engineers. In Taranaki there is a great demand for competent general labourers for road-work, &c., and the sawmills and building trades are very busy. In nearly all other parts also of New Zealand, except at Christchurch, the building trades have been very busy; and at Dunedin carpenters have been wanted. In the engineering trades all hands seem fully employed, but there is no special demand for extra men.

Correspondence.

Loads on Floors.

To the Editor of The Builders' Journal.

Chorley, Lancs.

Sir,—Having read the correspondence relative to "Load on Girders" in your issues of January 30th, February 20th and March 13th, I should like to make a few remarks concerning that portion which refers to loads on floors.

In your issue for February 20th, "J. D." informs us that "*a* text-book" gives 1¼ cwt. per sq. ft. distributed load as a proper allowance for a living-room floor, including weight of floor itself. Professor Adams states, in reply, that this text-book is not reliable, and cites "Molesworth" in his support, and also states that a "dense crowd averages 120lb. per sq. ft."

It is assumed, I take it, that in "J. D.'s" text-book the floor is an ordinary wood floor of joists and boarding with a plaster ceiling underneath. This floor and ceiling would weigh from 18lb. to 22lb. per sq. ft. (depending, of course, on size and spacing of joists, &c.); say, 20lb., leaving 120lb. for the live load, on the assumption of a total allowance of 11 cwt. per sq. ft.

I do not know whose text-book "J. D." refers to, but from another I am informed that "the engineers of the Chelsea bridge *packed picked* men (italics not mine) upon the platform of a weigh-bridge, with a result of 84lb. per sq. ft."; that "Mr. Nash, architect of Buckingham Palace, experimenting with reference to fireproof floors for that building, wedged men together as closely as they could possibly stand upon an area of 20ft. diam., the last man being lowered down from above among the others—result 120lb. per sq. ft." In another place it states: "The greatest load that can come upon an ordinary bridge is a dense crowd of people, and the French engineers estimate this at 41lb. per sq. ft. of platform"; that though "this is certainly as great as can well occur under ordinary circumstances, it may be considerably exceeded," &c., and advises that, to include for the crowd being in motion, &c., an allowance be made of not less than 100lb. per sq. ft., with a factor of safety of not less than 3 added to the weight of the bridge itself.

Now, is it really necessary to assume, or provide for, a dense crowd for an ordinary living-room floor? It seems to me not necessary. Does not the greatest load that is at all likely to come upon it occur during an auction, in which case it surely would not be more than "packed" with people (assuming all furniture removed), giving a load of 84lb. per sq. ft.; add to this, say, 28lb. per sq. ft. for the crowd in motion, making a total of 1 cwt. for live-load. We are still under 1¼ cwt. for the total load.

I think, therefore, that "J. D.'s" text-book is not proved to be unreliable—rather the reverse It is, no doubt, well to be on the safe side; but having reached that, there is surely no need for going further, especially where economy is an important factor.—Yours truly,

A. C.

Sir,—The text-book referred to by "J. D.," which says "1¼ cwt. per sq. ft., including weight of floor for distributed load," probably takes the figure from Hurst's architectural handbook, which was written before concrete floors were in common use, or the dead and live loads would have been dissociated. The weight of material alone in a concrete floor usually exceeds ½ cwt. per sq. ft., and when the strength of any floor is calculated it is usual to add its weight to whatever allowance per sq. ft. is taken for the external load. In the case of a common wood floor with single joists it is of little consequence either way, as its own weight is so small. In my "Handbook for Mechanical Engineers" I give the results of many experiments on the weight of crowds, varying from 35¼lb. per sq. ft. for people spaced as troops on the march to 147·7lb. quoted by B. B. Stoney in "Stresses." But the danger is not so much in the actual load as the increased stresses brought on by dancing, wrestling, moving heavy weights, &c. To provide for only 1 cwt. per sq. ft. total load and a factor of safety of 3 would be running a risk that might involve the attendance of a coroner later on.

Take an actual case. I have a room at home in which the floor joists are 3in. by 4in., 14½in. centre to centre, with a span reduced by sleeper walls to 7ft. An ordinary person walking across the room hurriedly shakes a bookcase against one of the walls somewhat severely, and dancing is quite out of the question. Calculation by the formula $\frac{c\,b\,d^2}{L}$ gives $\frac{3 \cdot 5 \times 3 \times 4^2}{7} = 24$ cwts. breaking weight in centre on each joist, or 48 cwt. distributed, and a factor of safety of 3 would make the safe load on each joist 16 cwts. distributed over 7ft. span, or $\frac{16}{7} = 2 \cdot 3$ cwt. per ft. run. The centre distance being 14½in., the equivalent load per ft. sup. is $\frac{12}{14\frac{1}{2}} \times 2 \cdot 3 = 1 \cdot 9$ cwt., or nearly double the amount that "A. C." would provide for, and yet the floor is too weak for ordinary uses. The common rule for such joists would be $\frac{7}{2} + 2 = 5\frac{1}{2}$ for depth, and $\frac{5\frac{1}{2}}{2} = 2\frac{3}{4}$ for thickness, or the nearest usual scantling of at least equal strength, say 7in. × 2in.—Yours truly,

HENRY ADAMS.

New Patents.

The following specifications were published on Saturday last, and are open to opposition until May 27th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—5,366, Knöfler, incandescent bodies for gas-lighting. 6,030, Farley, bearings for shafts applicable to air valves or ventilators. 6,996, Chorlton & Wentworth, rotary cutting, planing, and shaping appliances for woodworking machinery. 7,403, Graham, window fastener. 7,795, Calderbank, electric light fittings. 8,247, Grove, securing handles to spindles of locks and latches. 9,113, Thomson, portable machine for cutting mortises for locks. 9,215, Isler & Broadhurst, apparatus for earth-boring and pile-driving. 9,620, Smith, lavatory fittings. 13,227, Rech, band-saw machines. 16,564, Smith & United Alkali Co., Ltd., device for disinfecting water-supply. 21,019, Ketchum & Schwoob, wrenches. 22,280, Jones & Jones, night latches and draw-back locks. 22,417, Ford, gutters for use in stables and similar buildings. 22,625, Pearce, folding dressing-boxes for swimming baths. 23,850, Brookes (*Incandescent Gas Light Co.*), apparatus for incandescent gas-lighting.

1901.—1,397, Thompson, automatic flushing cistern. 1,398, Thompson, flushing cistern. 1,784, Jensen, means for repairing wooden stairs. 2,076, Ramsey, Burns & Haywood, fasteners for window sashes. 2,578, Glover, joiners' and similar cramps. 3,102, Baxter, toggles for stone-breaking, ore-crushing, and other machines. 3,296, Boult (*Soc. Lumière Boule*), burners for incandescent gas-lighting. 3,538, Napier, flushing tanks for water-closets. 3,553, Milnes, heat radiator. 3,947, Mainzer, mosaics.

Engineering Notes.

Visit of Glasgow Engineers to London.—For the last four years the Glasgow University Engineering Society has been accustomed each spring to visit one of the large centres of industry in this country. This year they visit London. The visit extends from April 16th to 20th.

The Death is announced of Mr. George Farren, M.I.C.E., F.S.S., of Carnarvon. At one time he was engaged under Messrs. Freeman & Son, and subsequently settled in Carnarvonshire, where, as a quarry-owner, he constructed, in connection with the Trevor Works, a complete village, with schools, chapels and a church.

The Death is announced of Mr. J. J. Tylor.—He died at his villa at Cap d'Ail, near Monaco, on April 5th. Though by profession an engineer, he had a well-merited reputation among specialists in Egyptian archæology. His series of enlarged photographs, completed by hand, of the "Wall Drawings and Monuments of El Kab" (1895–1900) presents a near approach to absolute reproduction of these important documents of ancient history.

Engineer's Heavy Failure.—A meeting was held last week of the creditors of Herbert Alexander, engineer, of Queen's Engineering Works, Leeds, and 159, Cannon Street, London. The statement of affairs showed gross liabilities £98,570, of which £64,857 is expected to rank for dividend. Assets were estimated at £38,442. The alleged cause of bankruptcy was the failure of a firm of foreign bankers.

The Blackman Ventilating Company, Limited, have acquired the business of Mr. James Keith, C.E., heating engineer (with departments in gas and hydraulic work), carried on at London and Arbroath. This union of two large businesses in ventilating and heating respectively rests largely on the essential dependence of these two branches upon each other for perfect development and successful use. Under the new name of **James Keith & Blackman Company, Limited,** the company has within itself the means of rapid first-hand production of all the best modern appliances for warming and ventilating.

The Andrew Carnegie Research Scholarship.—A research scholarship or scholarships, of such value as may appear expedient to the Council of the Iron and Steel Institute from time to time, founded by Mr. Andrew Carnegie (vice-president), who has presented to the Iron and Steel Institute certain debenture bonds for the purpose, will be awarded annually, irrespective of sex or nationality, on the recommendation of the Council of the Institute. Candidates, who must be under thirty-five years of age, must apply, on a special form, before the end of April to the Secretary of the Institute, at 28, Victoria Street, S.W. The object of this scheme of scholarships is not to facilitate ordinary collegiate studies, but to enable students who have passed through a college curriculum, or have been trained in industrial establishments, to conduct researches in the metallurgy of iron and steel and allied subjects, with the view of aiding its advance or its application to industry.

A Municipal Hot-water Supply.—A municipal hot-water pipe which supplies all the buildings in the town with hot water for heating purposes has been devised for the city of Chorbusco, Indiana. Large mains have been laid about 3ft. below the ground, and these are protected by many layers of corrugated paper and wood. Specially constructed boilers have been provided at the central station, and from these hot water is sent forth to all parts of the city. When the housewife desires her rooms to be heated, all she has to do is to turn on the tap, when the water flows through the pipes and radiates in a continuous stream, and in a very short time brings the atmosphere of the room up to the desired temperature. It is said that the system of regulation is so good that the heat can be controlled simply by reducing or increasing the flow of water as the occasion may require. Eventually the water finds its way back to the central station, where it is re-heated.

Contract for Widening Byker Bridge, Newcastle.—The Teesside Bridge and Engineering Company, Limited, of Middlesbrough, have secured the contract for the widening of Byker Bridge, Newcastle-on-Tyne. Eight firms sent in designs, and that of Teesside was considered the best and least expensive. Their tender amounts to £22,280. The Byker Bridge, which is of brick, is the property of the Newcastle Corporation, and connects Byker in the east to Newcastle by spanning the valley of the Ouseburn. The present structure, which is 1,280ft. long, has one roadway and one footpath, the total width being 32ft. 6in., not sufficient to accommodate two lines of tram rails and ensure safe traffic. It has been decided to increase the width of the bridge to 52ft. 6in., there being two footpaths 10ft. wide each, and the road 32ft. 6in. The above firm are to make provision for keeping the bridge open for foot traffic during the alterations with proper precautions for the safety of the public.

The Pier at St. Anne's, Lancashire.—The pier at St. Anne's, near Preston, is to be widened by Messrs. Garlick & Sykes, engineers, of Blackpool and Preston. The present width of the deck is 18ft., and the scheme provides for a widening to 34ft. The area of the pier-head is also to be extended to more than three times its present size. On the north-west is to be the pavilion, while on the opposite side will be an enclosure, surrounded by shops, refreshment rooms, &c., and furnished with a band stand. The arrangement is similar in its main lines to that adopted in the design of the North Pier at Blackpool. Before the work can be proceeded with it will be necessary to obtain a provisional order, and this cannot be applied for until November, when the plans will be deposited. It is therefore apparent that nothing can be done in time for the season of 1902.

East London Railway.—The Whitechapel and Bow Railway, which will connect the Tilbury and Southend Company's line with the underground railway systems of London, is making good progress. The erection of the new bridge over which the G.E.R. trains will pass to Fenchurch Street from Bow is now in hand, while the model dwellings which the company had to erect to accommodate the people displaced are completed. Work on the new stations at Stepney Green, Burdett Road, and Wellington Road is now proceeding and making rapid headway. Some idea of the magnitude of the work can be gauged by the fact that the construction of the line, which is only two miles long, will necessitate the use of 30,000 tons of cement, 13,000,000 bricks, 12,000 tons of steelwork, while no less than half a million tons of earth have to be excavated.

MANSFIELD NEW PUBLIC HALL.

THE Victoria Hall has just been erected by the Mansfield Brewery Company on a prominent position at the top of Leeming Street. The materials are red bricks, relieved by stone dressings. The chief hall measures 78ft. by 39ft. and 28ft. high, providing accommodation with balcony for upwards of 800 people. It is lighted by six semicircular windows on the north side, and a seventh in the gable end overlooking Leeming Street. A stage, fitted with appliances for theatrical performances and provision for an orchestra, occupies one end of the room, whilst four dressing rooms or retiring rooms with the necessary conveniences are to be found at the rear. The decorations of the hall are of an ornate character. The ceiling has been divided into seven bays by beams painted pale sage green, the plaster being Durescoed a cream tint. Inside each bay a decorative panel, worked in buff and grey, shaded and outlined with reddish brown, and containing some eminent name in music, poetry, or the drama, is painted. Over the stage is a large scroll design executed in grey, and shaded terra cotta, the walls being Durescoed in the same colour. The dado and woodwork are covered with a shade of pale green. The entrances are wide and lofty. Under the hall is a supper or dining room, which will also be used for smoking concerts, meetings, &c. The architects are Messrs. Vallence & Westwick, of Mansfield; the builders Messrs. J. Hutchinson & Sons, Nottingham; whilst the decorating has been done by Mr. C. E. Greenwood, Mansfield.

Views & Reviews.

SPECIFICATIONS.*

Few architects enjoy the trouble and mental drudgery connected with the preparation of an ordinary specification. At the present time there is an increasing tendency to call upon the quantity surveyor to draft the specification in addition to the bills of quantities, and, provided that the architect has supplied the requisite data, such a course is generally satisfactory. On the other hand, many architects prefer to draw up their own specifications; for having prepared the drawings, and being about to superintend the work, they naturally consider that they can best describe their own particular requirements. In either case, it must be remembered that such a document necessitates the most careful consideration, for it possesses considerable legal importance in a building contract. A well-written specification should therefore clearly and concisely describe the local conditions under which the work is to be carried out, whilst at the same time supplying detailed particulars of the several materials and workmanship required, so that the builder may be afforded every reasonable facility in properly interpreting the drawings, and by this means clothe in suitable and concrete form the architect's original conception.

Mr. Leaning's exhaustive work on building specifications cannot but prove to be of the greatest assistance to the specification writer, whether architect or quantity surveyor, and we congratulate the author on the admirable manner in which he has dealt with the subject. This handsome volume contains upwards of 600 pages and 140 illustrations. The broad principles underlying the preparation of a well-considered specification are in the first place succinctly set forth, and the suggested order in which the various items of each trade should be taken is conveniently given in tabular form. This summary will be found extremely useful for comparison, and also for securing a systematic and uniform order of procedure.

A valuable feature of the work consists of a complete specification for a large mansion, including stables, conservatory, and boundary walls. It comprises 714 clauses, and provides a very good model for purposes of general reference, although in some few matters of detail it scarcely describes the most modern or approved methods of construction. When iron drains and fittings are used in high-class work it is usual to provide cast-iron access pipes or junction boxes, fitted with proper covers and fastenings, to all inspection or intercepting chambers, instead of the ordinary iron channels or pipes mentioned here. In clause 87 it is laid down that no four courses of brickwork with their joints shall rise more than 12in. high. Generally it is preferable to specify that every four courses of brickwork are to gauge in height not more than 1in. in addition to the four courses if laid dry. The maximum thickness of joints permissible in the brickwork is thus closely defined, and is quite independent of the thickness of bricks used, for the latter may vary from 2½in. to nearly 3in. thick, according to the particular yard or locality from which they are obtained. Breeze-concrete lintels cast in moulds, and having one or more rolled steel joists of suitable section embedded in them are now superseding fir lintels in large or important buildings; but only the well-known clause relating to the provision of wood lintels to all openings finds a place in this specification. An alternative clause giving particulars of the more durable and fire-resisting variety would have been appreciated. Taken as a whole, however, this typical specification is full, comprehensive, well-balanced, convenient in arrangement, and accurate.

In addition to the representative specification just noticed, a series of clauses are given which apply more particularly to works of special character. These sub-sections include sewers, cofferdams, camp-shedding, concrete buildings, alterations, additions, and repairs; church restoration and underpinning, schools, churches, warehouses and manufactories, public baths, underground conveniences, shop-fronts, public-houses, cold storage, heating of buildings, electric

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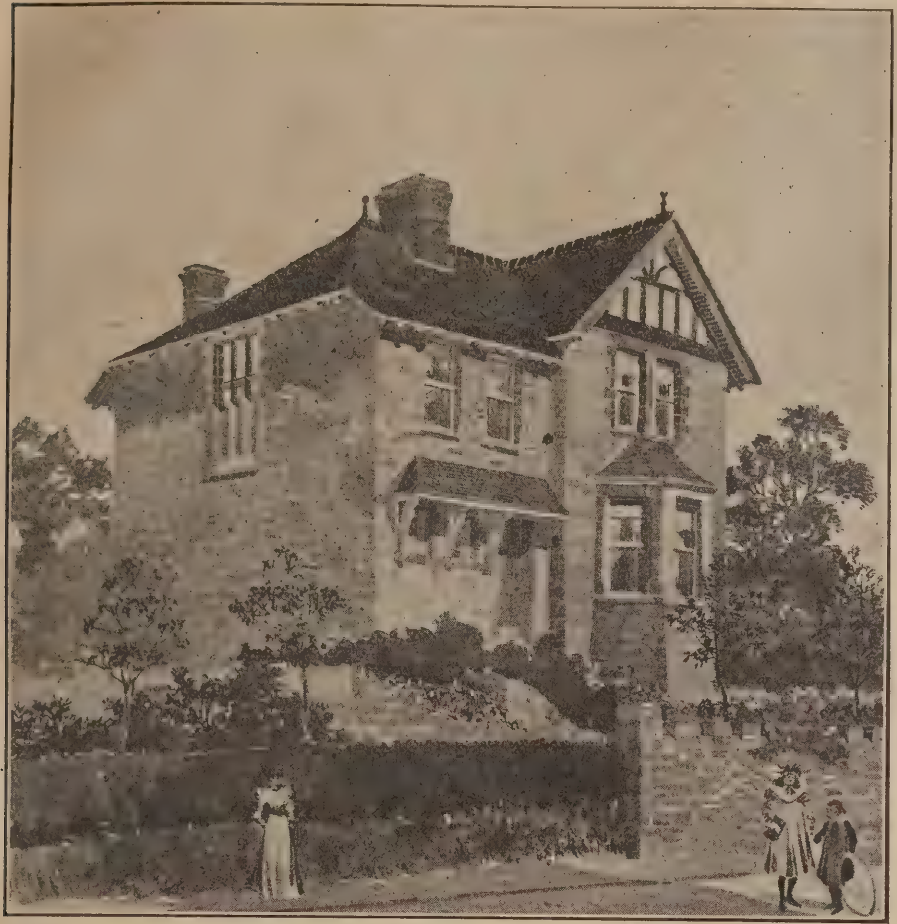
* "Building Specifications." By John Leaning, F.S.I. London: B. T. Batsford, 94, High Holborn. Price 18s. nett.



"INGLENEUK," DOWNEND, NEAR BRISTOL. LA TROBE & WESTON, ARCHITECTS.

lighting, roads and paths. It is strange that there is no sub-section containing some of the clauses peculiar to hospital construction (such as the provision of rounded angles to plastering, skirtings, door and window finishings, &c.), considering the importance of this class of buildings.

The author's remarks on building contracts are well worth careful perusal, and in this connection the general conditions of contract as revised by the Royal Institute of British Architects are quoted in their entirety, together with detailed examples relating to the provision of separate contracts for special materials such as structural ironwork; the manufacture, delivery, and fixing of terra-cotta, faïence, &c.

The practical character of the work is considerably enhanced by the large amount of information which is given concerning the different trades and methods of executing work, and includes some important notes on foundations, drains, paving, qualities and descriptions of building stones, shippers' marks on timber, fire-resisting materials, &c.

Mr. Leaning's book can be thoroughly recommended to all who desire to become conversant with the art of specification writing, and also to those who require a reliable text-book which may be consulted in any case of difficulty or doubt.

T. E. C.

"Ingleneuk," Downend, near Bristol.

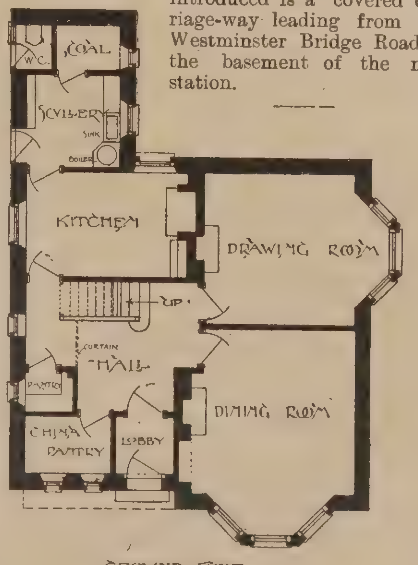
THIS house stands on a quarter-acre plot on a suburban estate which has recently been laid out. The object aimed at was to secure a convenient and pleasing house at about the same cost as that of the usual speculative house. The walls are built of the local red-grey Pennant stone, with Bath stone dressings and tiled roofs. The woodwork is painted a sage-green colour. A feature of the plan is the way in which all the flues are gathered into a central stack, thus minimising the loss of heat. The kitchen premises are screened off by a curtain, and as one bedroom is entered from the half-space on the stairs a picturesque effect both in the hall and externally is obtained. The architects were Messrs. La Trobe & Weston, of Bristol.

A NEW NECROPOLIS STATION.

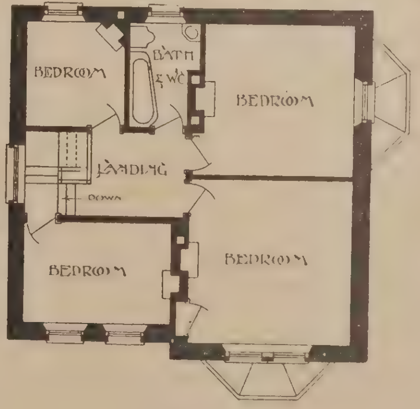
FOR a long time past the London Necropolis Company have found their station at Waterloo totally inadequate, and it was decided to erect a new station. This is now rapidly nearing completion, and when finished will have cost about £100,000. It occupies a new site, a little further down the line than the old premises. The new station is built on most elaborate lines, elaborate arrangements being made for the expedition of business and the comfort of mourners. There will be two separate platforms and a private chapel, and suitable provision has been made in the shape of comfortable waiting-rooms. There are several mortuaries of different sizes, and electric lifts from the road level to the departure platform. Among other new features introduced is a covered carriage-way leading from the Westminster Bridge Road to the basement of the new station.

A NEW INFECTIOUS DISEASES HOSPITAL FOR CHORLEY.

THE New Chorley Joint Infectious Diseases Hospital has been erected on a site of about six acres at Heath Charnock. Messrs. Jolly & Buckley, of Chorley, were the architects, and the contractor was Mr. Robert Brownley, of Chorley, with Mr. Leonard Fairclough, of Adlington, as sub-contractor for the stonework, Messrs. J. Fairclough & Sons, of Chorley, sub-contractors for the slating and plastering, and the executors of Mr. Heald for the plumbing, the painting and the glazing. The cost of the work (including furnishing and sewerage) is £17,000. The hospital consists of five blocks of buildings, namely, the administrative block, the diphtheria block, the typhoid fever block, the scarlet fever block, and the working block. To the right of the entrance gate is the administrative block from the vestibule of which opens a waiting-room for the friends of patients. From the vestibule a spacious hall is entered, from which lead off the matron's sitting room, a sitting-room for the nurses, doctors' dispensary and sitting-room, and the kitchen accommodation. In the hall is the telephone switch board, which will enable the matron to communicate with, and to receive communications from, all parts of the district and the nurses' rooms in the several pavilions. From the hall a staircase gives access to the upper floors. On the first floor are eight bedrooms for nurses and probationers, and the matron's bedroom, which is provided with electric communication with the servants. A bathroom, a linen store (the contents aired by hot water pipes), and the usual offices complete the accommodation. On the second floor are bedrooms for the domestic servants, with, on the landing, a large storage tank of water ready for use in the event of fire or any other emergency. The windows, with irregular panes, admit plenty of light, and escape a monotonous uniformity; the walls are tastefully, yet not too ornately coloured. Totally separate from the administrative quarters, and ranging in blocks from north to south, are the hospital buildings proper. Each block has a glass verandah, covering a plainly-tiled approach from the road leading to the pavilion. Further west is the diphtheria pavilion. Here are provided two wards. From a room between the nurses can survey all that goes forward in the wards, and receive through a special window the food sent from the kitchen of the administrative block. Two other wards in the diphtheria pavilion are respectively for miscellaneous cases and for cases which are undiagnosed; and the same arrangement in regard to the nurses exists for these wards, and in the other pavilions also. These other pavilions are the typhoid pavilion and the scarlet fever pavilion. Each consists of two wards—one for males and the other for females. The ward floors are of wood blocks. In the typhoid and scarlet fever pavilions provision is also made for the immediate ejection from the building of soiled linen, bound for the disinfector near; and the wards are warmed by Shorland's patent stoves. The last block—the working block—contains the disinfector house, the laundry, the mortuary, the stables, and the ambulance house.



GROUND FLOOR



FIRST FLOOR

"INGLENEUK," DOWNEND, NEAR BRISTOL. LA TROBE & WESTON, ARCHITECTS.

Keystones.

A Statue of the late Queen is proposed to be erected at Harwich.

A Bronze Statue of Sir W. T. Lewis, Bart., has been erected in the grounds of the Merthyr Hospital. The statue, sculptured by Mr. Brock, R.A., is life size, and is placed upon a granite pedestal, the work of erection having been carried out by Mr. Evan Jones, of Dowlais. From the foundation to the crown of the head the statue is 17ft. in height.

A New Police Station and Branch Library Premises in Dewsbury Road, Leeds, are to be erected from designs of Messrs. Bedford and Kitson, at the estimated cost of £12,050 The plans had been selected by the assessor in a competition open to Leeds architects. Application is also to be made to the Local Government Board for sanction to the borrowing of £9,059, the estimated cost of branch premises at Stocks Hill, Armley.

An Ancient Cross at Aldford, near Chester, which stands in the churchyard, has been restored in memory of the late Duke of Westminster. The restored cross stands on the original worn stone steps, and consists of a shaft about 11ft. high. The material used is Runcorn stone. The design has been copied from the 15th-century cross in Betterley churchyard. Mr. F. G. Sewell, of Chester, has carried out the work.

New Cattle Market for Truro.—A Local Government Board enquiry was held recently into an application by the Truro Corporation for sanction to borrow £5,400 for the entire remodelling of the cattle market. The plans have been prepared by the surveyor and engineer, Mr. M. Lea. The new market by the addition of a new piece of land will cover 6,588 square yards. The present variation of levels will be altered, so that the new market will be level. Accommodation will be provided for 3,200 sheep, 500 pigs, and 575 beasts, which is nearly double that of the present market.

A new Cottage Hospital at St. Andrews is to be erected on a site at the east corner of Abbey Park, on ground extending to about three-quarters of an acre. On the ground floor will be three wards, containing four, two, and four beds respectively. There is also a large and well-lighted surgery, and a sitting-room for the matron and staff, and there is also a spacious and well-lighted staircase. On the floor of the central block there is a female ward containing two beds, and a children's ward with six cots. There are also four bedrooms for the nursing staff and servants. The kitchen accommodation is in a separate wing to the back. The architect is Mr. Charles F. Anderson, of St. Andrews.

The Glasgow Architectural Association recently visited Sauchie and Clackmannan Towers, the former through the courtesy of the Earl of Mansfield, and the latter by permission of the Marquis of Zetland. The leader at Clackmannan Tower was Mr. A. F. Balfour Paul, who gave an exhaustive and interesting description of the old castle, and recalled all its historical associations. The party then drove to Sauchie Tower, where Mr. John Watson acted as leader, and exhibited measured drawings which he prepared many years ago before the topmost portion of the tower was demolished. The castle and the fine old cottages adjoining were examined and described.

A Municipal School of Cookery.—A Local Government Board enquiry was held recently into the application of the Newcastle Corporation for sanction to borrow £10,000 for the purpose of erecting a new school of cookery in Northumberland Road. The Northern Counties School of Cookery and Domestic Economy has been in existence about seven years. It was first commenced by the Newcastle City Council, who were afterwards joined by the Northumberland County Council. It is now proposed to build a new school, on a site belonging to the Magdalene Hospital Trustees (the Newcastle Corporation). It was at first thought that £6,000 would suffice for the building, but after plans had been chosen it was found that £8,000 would be required. The building will last fifty years. Mr. J. W. Dyson is the architect.

Mr. Eden Upton Eddis, the well-known portrait painter, died last week.

The Camberwell Infirmary, in Brunswick Square, is to be extended and completed from plans by Mr. Edwin T. Hall, F.R.I.B.A., of 57, Moorgate Street, E.C.

Mr. H. Percy Monckton, F.R.I.B.A., 32, Walbrook, is the architect for the erection of an isolation hospital and administrative block by the Wrotham Urban District Council.

An Opening for an Architect.—The town of Narberth and the large neighbourhood surrounding the town is at present without an architect, the late architect, Mr. J. M. Thomas, having left no one to succeed him.

Marble Quarries in Alaska have just been discovered, and are said to be almost as valuable as the gold mines there. The quarries are in the southern part of the territory, and the marble is said to be of finer quality and more beautiful than any now produced in the United States, and fully equal to Italian marble.

Two pupils of Mr. J. M. Boekbinder, decorator, of 11, Pratt Street, Camden Town, N.W., who are studying modelling at his establishment, gained a £10 prize each in a competitive exhibition of work under the L.C.C. held at the Northampton Institute recently. The pupils, who are both young lads—one aged sixteen and the other fifteen years—attend the Northampton Institute by Mr. Boekbinder's advice.

The Hearts of Oak Benefit Society have purchased for £36,000 freeholds in Euston Road and Grafton Place as a site for new offices. It has been decided that the leases of a third of the premises shall be purchased for the erection forthwith of suitable offices, for the best designs for which it has been decided to offer premiums of £100, £75, and £50. The cost is not to exceed £55,000.

A Torquay Memorial.—The memorial to the late Mr. Richard Mallock, of Cockington Court, and formerly M.P. for the Torquay Division, is to take the form of a clock tower to be erected on the Strand, Torquay, opposite the Queen's Hotel, and the clock is to have three illuminated dials facing the roads converging there. Competitive designs have been called for, and have to be sent in this month. Mr. James Hine, F.R.I.B.A., of Plymouth, has been appointed assessor.

New Public Wash-houses at Lochee have been opened. The cost of erecting and equipping the buildings has been about £2,800. The main building is 70ft. long by 35ft. broad, and contains twenty-two washing stalls, each with all the latest appliances, consisting of two washing tubs, clothes wringer, boiling tub, and drying horse. The contractors were as follow: Mason work, Mr. James Powrie; joiner work, Mr. John Morrison; slater work, Messrs. Laburn & Son; iron work, Messrs. Nicoll & Jack; plumber work, Messrs. A. L. Peacock & Co.; plasterer work, Messrs. Reoch & Kilgour; painter work, Mr. Arkinson.

Mr. Henry Holtom, a former mayor of Dewsbury, died recently at his native town of Stratford-on-Avon at the age of sixty-four years. An architect and surveyor by profession, he went to Halifax, and then to Dewsbury, and in succession had for partners Mr. W. Bulmer, Mr. Wreghitt Connon, and Mr. G. A Fox. He designed and erected numerous public buildings, including town halls, a free library, central co-operative stores, and board schools. He was placed on the commission of the peace for Dewsbury, and on removing to Stratford soon took a leading position, being elected to the Council and made a county justice.

A New Primitive Methodist Church at Hasland has been erected from designs by Mr. W. Cecil Jackson, M.S.A., architect, of Chesterfield—except for the building of the tower, which has been deferred for a time. The general arrangement internally consists of a large vestibule and chapel, together with two transepts, choir, and minister's vestry; also a separate portion for choir accommodation. The internal fittings are all of pitch pine, the windows being fitted with stained glass. The roof is an open-timber one. The rostrum is in pitch pine. The accommodation of the building is 400, and the total cost, including land, about £3,000.

Mr. George Wragge, whose works are at Manchester, has removed his London premises from 22, Surrey Street, Strand, to 211, Shaftesbury Avenue, W., where he exhibits in a ground-floor show-room all kinds of stained glass, leaded glass, repoussé and other metal work.

Dr. John Sykes, M.D., F.R.C.P., died at Doncaster recently. Although a medical man of some eminence in his profession, he was chiefly distinguished for antiquarian research, and was for many years a Fellow of the Society of Antiquaries.

The English Archæological Society at Rome was opened last week at the Odescalchi Palace. The establishment of the school is due to the initiative of Professor Pelham, of Oxford University, and its object is to interest the English Universities in the study of archæology.

Hindley District Council Offices Competition.—The first premium in this competition has been awarded to Messrs. Heaton, Ralph & Heaton, architects, of Wigan. The cost of the buildings will be about £7,000. The competitors numbered between seventy and eighty.

New Schools for Greenwich.—The foundation stone of the new schools for children chargeable to the Greenwich Board of Guardians, on a site purchased by the board at Sidcup, was laid last week. The cost of site and buildings is approximately £120,000. Accommodation is provided for 524 children.

A Stained Glass Window has been erected as a memorial to the late Earl of Londesborough by the tenantry of the Seamer estates in St. Martin's Church, Seamer, in the south aisle of the church, just above the pulpit. The window is of three lights, the centre representing the Transfiguration, whilst the side-lights bear the figures of the Apostles and holy women. Underneath the central figure is the coronet and coat-of-arms of the Londesborough family. The lights on either side of this are allegorical of Christ feeding the hungry and clothing the naked. The window, which has cost £125, was designed by Messrs. Burlison & Grylls, of London.

Baptist Schools, Histon, Cambs.—The foundation stone of these schools was laid recently. The school is divided off into a number of class-rooms by means of divided partitions, which, when thrown back, make one large hall. Two other large senior class-rooms are provided; also infants' room, kitchen, class-rooms for boys and girls, with the usual offices. The building is of nave and aisle arrangement, the aisles dividing off into class-rooms, with timber columns and arches of quaint design, carrying clerestory. The whole of the internal joinery is to be stained transparent olive green and varnished. The external facing is of red brick with bath-stone dressings, and the roof is of green slates. The contract is let to Mr. H. Feast, builder, Haddenham, Cambridge, and amounts to £1,852. The architects' estimate was £1,875. The architects of the schools, and also of the church recently completed, are Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5, Clement's Inn, Strand, W.C.

Dunfermline Baths Completion.—It having been found that the cost of the competitive designs for the new baths and gymnasium to be erected at Dunfermline exceeded Mr. Carnegie's original offer of £20,000 the committee in charge of the undertaking communicated the estimates to Mr. Carnegie. Mr. Carnegie has now intimated that he agrees to increase the amount offered originally for the construction and equipment of the proposed buildings so that the committee may be free to choose the design which they think most suitable, but that he relies on the committee satisfying themselves that the accommodation to be provided, while ample, should not be in excess of the probable future requirements of the town, and that there should be no expenditure on needless display. The committee have invited Mr. Hippolyte J. Blanc, A.R.S.A., architect, to meet them at an early date, Mr. Blanc's design having thus apparently been accepted. The prizes offered for the designs have been awarded as follows: 1st (50 guineas), Andrew Muirhead, Dunfermline; 2nd (30 guineas), David Barclay, Glasgow; 3rd (20 guineas), James T. Scobie, Dunfermline. The new baths and gymnasium are to be erected in Pilmuir Street, on a site acquired by the town at a cost of £4,000.

New Companies.

W. Rowe & Son, Limited.

Registered March 25th to carry on the business of plumbers, ironmongers, brassfounders, ironfounders, engineers, &c. Capital £3,000 in 550 ordinary shares of £5 each and 250 deferred shares of £1 each. W. T. F. Rowe is sole director till the subscribers appoint a board.

T. C. Williams & Sons, Limited.

Registered March 22nd to acquire the business carried on by W. W. Williams, at Reading, as T. C. Williams & Sons, and to carry on the business of manufacturers, ironmongers, ironfounders, heating and ventilating engineers, &c. Capital £20,000 in £1 shares (4,000 preference). The first directors are W. W. Williams (chairman), A. S. Williams, W. G. Millar, W. Haynes, and C. A. Rollason.

Neal & Company, Limited.

Registered March 23rd to acquire the business carried on by J. F. Neal at Heather, Leicestershire, and elsewhere, and to carry on the business of red brick, tile, and terra-cotta manufacturers, miners, coal and iron masters, chemical manufacturers, &c. Capital £25,000 in £10 shares. The first directors are J. F. Neal, N. Joyce and J. T. Jacques.

British Grey Granite Company, Limited.

Registered March 27th to acquire certain granite quarries and quarrying rights in the county of Carnarvon, and to carry on the business of quarry owners, stone merchants, masons, paviors, contractors, &c. Capital £10,000 in £1 shares. Registered office: Comberton Hill, Kidderminster, Worcestershire.

COMING EVENTS.

Wednesday, April 17.

British Archæological Association.—Mr. C. E Keyser, M.A., F.S.A., on "Sculptured Tympana of English Norman Doorways"; and Mr. T. Cann Hughes, M.A., F.S.A., on "Interments at Bleasdale, North Lancashire," 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Quarterly meeting, 8 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part II.—Mr. E. Petronell Manby, B.A., M.D., on "The Hygiene of Byres, Lairs, Cow-sheds and Slaughter-houses, and all places where animals destined for the Supply of Food are kept, and the Hygiene of Markets, Dairies, and other places where food is stored, prepared, or exposed for sale, and transported," 7 p.m.

Edinburgh Architectural Association.—Sir John Sibbald on "The Construction of an Asylum for the Insane Poor from the Medical and Administrative Points of View," 8 p.m.

Society of Arts.—Prof. Raphael Meldola, F.R.S., on "The Synthesis of Indigo," 8 p.m.

Building Trades Exhibition opens at the Royal Agricultural Hall, Islington.

Thursday, April 18.

Chemical Society.—Meeting at 8 p.m.

Society of Antiquaries of London.—Meeting at 8.30 p.m.

Institute of Electrical Engineers.—Mr. A. Campbell on "Test Room Methods of Alternate Current Measurements"; and Mr. C. W. S. Crawley on "The Use of the Differential Galvanometer"; announcement of the Council's nominations for the Council 1901-2. 8 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part II.—Mr. James King, M.R.C.V.S., on "Diseased Meat," 7 p.m.

Royal Institution.—Mr. Roger Fry on "Naturalism in Italian Painting"—I., 3 p.m

Friday, April 19.

Architectural Association.—Mr. M. A. Green on "Eighteenth-Century Architecture of Bath," 7.30 p.m.

Institution of Civil Engineers.—Students' Meeting. Mr. E. V. Clark, B.Sc., on "The Theory of Cast-Iron Beams," 8 p.m.

Institute of Builders.—Visit to Building Trades Exhibition, Royal Agricultural Hall, Islington.

Institution of Mechanical Engineers.—Presidential Address by Mr. William H. Maw, 8 p.m.

Royal Institution.—Prof. J. J. Thomson, M.A., F.R.S., on "The Existence of Bodies smaller than Atoms," 9 p.m.

Saturday, April 20.

Sanitary Institute.—Lectures and Demonstrations, for Sanitary Officers, Part II.—Inspection and Demonstration at Knacker Yard at 3 p.m.

Royal Institution.—Mr. John Young Buchanan on "Climate: Its Causes and its Effects"—I., 3 p.m.

Architectural Association.—Visit to Building Trades Exhibition.

Edinburgh Architectural Association—Visit to Duddingston House and Church, and Chapter House at Restalrig.

Monday, April 22.

Royal Institute of British Architects.—Mr. Francis Bond, M.A., on "The Classifications of Romanesque and Gothic Architecture," 8 p.m.

Society of Arts (Cantor Lecture).—Sir William Chandler Roberts-Austen, K.C.B., F.R.S., on "Alloys"—I.

Surveyor's Institution.—Fourth Junior Meeting, at 7 p.m.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers, Part II.—Mr. E. Petronell Manby, B A., M.D., D.P.H., on "The Laws, By-laws, and Regulations affecting the inspection and sale of Meat and other articles of Food, including their preparation and adulteration."

Tuesday, April 23.

Society of Antiquaries of London.—Anniversary Meeting at 2 p.m.

Wednesday, April 24.

Geological Society of London.—Meeting at 8 p.m.

Society of Architects.—Annual Dinner at the Prince's Restaurant at 6.30 p.m.

Society of Arts.—Mr. Alexander Siemens on "Patent Law Reform," 8 p.m.

Edinburgh Architectural Society.—Address by Mr. Harold O. Tarbolton, the Hon. President, and Award of Prizes in competitions.

Institute of Sanitary Engineers.—Visit to Building Trades Exhibition.

CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Hay, best	per load	4	0	0	4	7	6
Sainfoin mixture	do.	3	10	0	4	10	0
Clover, best	do.	4	5	0	5	0	0
Beans	per qr.	1	16	3	1	17	6
Straw	per load	1	8	0	1	16	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	2	2	1	12	1
Colza Oil, English	do.	1	7	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	1	0		—	
Lead, white, ground, carbonate	do.	1	4	10			
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels	do.	1	6	6		—	
Petroleum, American	per gal.	0	0	6 9/16	0	0	6
Do. Russian	do.	0	0	6⅜	0	0	6½
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	2	18	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	4	6	1	5	0
Tar, Stockholm	per barrel	1	8	0		—	
Turpentine	per cwt.	1	7	6	1	17	0

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	84	0	0		—	
Iron, Staffs., bar	do.	6	10	0	9	10	0
Do. Galvanised Corrugated sheet	do.	11	0	0		—	
Lead, pig, Spanish	do.	12	7	6		—	
Do. do. English common brands	do.	13	0	0			
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0			
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do., floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	5	0	6	10	0
Do. Mild Bars	do.	7	5	0	7	15	0
Tin, Foreign	do.	114	12	6	115	2	6
Do. English ingots	do.	118	10	0		–	
Zinc, sheets, Silesian	do.	20	10	0			
Do. do. Vieille Montaigne	do.	21	0	0		–	
Do. Spelter	do.	16	2	6	16	15	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Do. Pitch	do.	2	10	0	2	15	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P.Std.	9	15	0	17	0	0
Do. do. 4th & 3rd	do.	11	15	0	13	5	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	15	0	15	5	0
Do. do. 2nd „	do.	8	15	0	14	15	0
Do. do. Unsorted „	do.	5	5	0	13	0	0
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	11	10	0	16	15	0
Do. White Sea	do.	9	15	0	13	0	0
Do. Quebec Pine, 1st	do.	22	0	0	23	0	0
Do. do. 2nd	do.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0	12	15	0
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	7	0	0	8	15	0
Flooring Boards, 1in. prepared, 1st	per square	0	12	0	0	13	0
Do. 2nd	do.	0	9	6		—	
Do. 3rd &c.	do.	0	9	0		—	

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
April 19	Culcheth, near Kenyon Junction—Cottage Homes, &c.	—	H. Lord, 42 Deansgate, Manchester.
" 19	Salford—Cottage Homes, &c.	Guardians	H. Lord, 42 Deansgate, Manchester.
" 19	Blackpool—School	School Board	H. Wade, Empress Chambers, Church Street, Blackpool.
" 19	Ardrossan, Scotland—Additions	—	J. Armour, Architect, Irvine.
" 19	Londonderry—Houses	P. Campbell and M. Masterson	E. J. Toye, Architect, Strand, Londonderry.
" 19	Seascale, Cumberland—Alterations	Misses Wilson	W. G. Scott & Co., Victoria Buildings.
" 19	York—Extension of Banking premises	—	Botterill, Son & Bilson, 23 Parliament Street, Hull.
" 19	Great Yarmouth—Hall	—	Harrap, Messrs. Mayoh & Haley, Engineer's Office, New Britannia Pier, Gt. Yarmouth.
" 19	Hull—Extensions	—	Botterill, Son & Bilson, 23, Parliament Street, Hull.
" 20	Bulwell—Boundary Wall—Improvement Committee	—	A. Brown, City Engineer, Guildhall, Nottingham.
" 20	Merthyr Tydfil—Cottages	Lancs. Building Club	E. A. Johnson, Architect, Merthyr.
" 20	Carrickfergus—Houses	Governors of the Charles Shells Charity	Young & Mackenzie, Scottish Provident Buildings, Belfast.
" 20	Cressing, Essex—School Buildings	School Board	Clare & Ross, 66 Duke Street, Chelmsford.
" 20	Knaresborough—Resetting retort beds	Urban District Council	T. Mainman, Clerk, Knaresborough.
" 20	Halifax—Bricks, &c.	Highway and Tramway Committee	Borough Engineer, Town Hall, Halifax.
" 20	Chichester—Alterations, &c.	—	Secretary of Institute, South Street, Chichester.
" 20	Eston, Yorks—House, &c.	—	W. Stead, County Surveyor, Northallerton.
" 20	Grafton, nr. Boroughbridge, Yorks—Chapel	—	Wesleyan Chapel Vestry, Boroughbridge.
" 20	Leuchars, Scotland—Additions, &c.	—	H. Bruce, County Buildings, Cupar, Fife.
" 20	Merthyr Tydfil—Alterations, &c.	A. Buchan & Co.	J. Ll. Smith & Davies, 50 High Street, Merthyr Tydfil.
" 20	Kildrummy—Mason, Carpenter, and Slate Works	—	A. Taylor, Castle Cottage, Kildrummy.
" 20	Truro—Boundary Wall	Park and Planting Committee	M. Lea, City Surveyor, Municipal Buildings, Truro.
" 22	Leeds—Reel House, &c.	Watch Committee	City Engineer, Municipal Buildings, Leeds.
" 22	Willenhall, Staffs—Extension of Fire Station	Urban District Council	T. E. Fellows, Town Hall, Willenhall.
" 22	Yardley—Fire Station, &c.	Rural District Council	A. W. Smith, 460 Stratford Road, Sparkhill.
" 22	Letterkenny—Renovation	—	J. McIntyre, Architect, Main Street, Letterkenny.
" 22	Canterbury—Boiler House, &c.	Guardians	G. Smith, Station Road, St. Dunstan's, Canterbury.
" 22	Chailey, Sussex—Alterations	Guardians of Lewes Union	H. C. Card, 10 North Street, Lewes.
" 22	London, S.W.—Brick Bridge Abutments, &c.	West London Extension Railway Co.	Engineer's Office, Paddington (G.W.R.) Station.
" 22	Aberdeen—Dwelling Houses and Steadings	—	Estate Office, Haddo House, Aberdeen.
" 28	London, S.W.—New War Office, Whitehall	Commissioners of H.M. Works, &c.	Sir John Taylor, H.M. Office of Works, Storey's Gate, S.W.
" 23	Ponteland, Northumberland—Bridge	County Council	Moot Hall, Newcastle.
" 23	Stalybridge—Post Office	Commissioners	Clerk of Works, Stalybridge.
" 23	Rothie—Mason, Carpenter, and Slate Works	—	J. Duncan & Son, Architects, Turriff.
" 23	Burnonill, St. Fergus—Reconstruction of Bridge	—	W. Dawson, Road Surveyor, New Maud.
" 23	Brighton—Enlargement and Alteration	School Board	T. Simpson & Son, 16, Ship St., Brighton.
" 23	Pengam—Class-rooms, Laboratory, Theatre & Hall, &c.	Governors	James & Morgan, Charles Street, Chambers, Cardiff.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING—*cont.*:		
April 24	Carrickfergus, Ireland—Manse	Rev. Jolyon	S. P. Close, Architect, Carrickfergus.
,, 24	Crook, Durham—Rebuilding	——	Constitutional Club, Church Street, Crook.
,, 24	Edinburgh—School	School Board	R. Wilson, 3 Queen Street, Edinburgh.
,, 24	Glenisla, Scotland—Cottage	——	D. Ross, Road Surveyor, Kirriemuir.
,, 24	London, W.C.—Alterations, &c. to Workhouse	Willesden Guardians	A. S. Snell, 22 Southampton Buildings, Chancery Lane, E.C.
,, 24	Clowne, Derbyshire—Lock-up	Standing Joint Committee	J. S. Story, County Offices, St. Mary's Gate, Derby.
,, 24	Coventry—Repairs	Hospital Committee	H. W. Chattaway, Architect, Trinity Churchyard, Coventry.
,, 25	Sunderland—Workmen's Dwellings	Corporation	Borough Surveyor's Office, Town Hall, Sunderland.
,, 25	Halifax—Villa, &c.	S. Broadbent	W. O. Williams, 29 Southgate, Halifax.
,, 25	Keith, Scotland—Villa	P. Cumming, Inland Revenue	D. & J. R. M'Millan, 211 Union Street, Aberdeen.
,, 25	Rainhill, Lancs.—Cottage	Lancs. Asylum Board	J. Jornal, Clerk, Rainhill.
,, 26	New Clee—Schools	Great Grimsby School Board	H. C. Scaping, Architect, County Chambers, Grimsby.
,, 26	Great Grimsby—Schools	School Board	H. O. Scaping, Court Chambers, Grimsby.
,, 27	Ramsgate—Shedding Offices	East Kent Agricultural Society	P. M. Collard, Secretary, Canterbury.
,, 27	Wrotham—12 Workmen's Dwellings	Urban District Council	J. Sharp, 5 Sunnyside, Borough Green, Wrotham.
,, 29	Salterhebble, Yorks.—Houses	——	J. F. Walsh & G. Nicholas, Lancs. and Yorks. Bank Chbrs., Halifax.
,, 29	Halifax—Chapel, &c.	——	R. Horsfall & Son, 22A, Commercial Street, Halifax.
,, 29	Glasgow—Station Buildings	Caledonian Railway Company	Company's Engineer, Buchanan Street Station, Glasgow.
,, 29	Edinburgh—Wood Finishing	Corporation's Gas Commissioners	W. R. Herring, New Street Works, Edinburgh.
,, 30	Sunderland—Villas, &c.	County Borough Asylum at Ryhope	Borough Surveyor's Office, Town Hall, Sunderland.
,, 30	London, S.W.—Foundations of Admiralty Buildings	Commissioners of H.M. Works, &c.	Sir J. Taylor, H.M. Office of Works, &c., Storey's Gate, S.W.
,, 30	Woolston, Hants—Alterations	United District School Board	W. H. Mitchel, Son, & Gutteridge, 9 Portland Street, Southampton.
,, 30	Hinckley—Post Office	Commissioners of H.M. Works, &c.	H.M. Office of Works, &c., Storey's Gate, S.W.
	ENGINEERING:		
April 19	Edinburgh—Hydrants, &c.	Great Western Railway Company	Engineer's Office, Paddington Station.
,, 19	London, S.E.—Lamp Brackets, &c.	Southwark Borough Council	Kincaid, Waller, & Manville, 29 Great George St., Westminster, S.W.
,, 20	Edinburgh—Materials	Council, Lord Provost, and Magistrates	Engineer's Office, 5 Dewar Place, Edinburgh
,, 21	Palencia—Telephone System	Spanish Government	Commercial Department, Foreign Office, Palencia.
,, 22	Glasgow—Bridge	Caledonian Railway Company	Engineer, Buchanan Street Station, Glasgow.
,, 22	Dublin—Plant	Corporation	S. Harty, City Hall, Dublin.
,, 22	Auchterarder, Scotland—Water Supply Works	Town Council	J. P. Kennaway, Town Clerk, Auchterarder.
,, 22	Melrose, Scotland—Reservoir, &c.	Town Council	Belfrage & Caifrac 1 Erskine Place, Edinburgh.
,, 23	London, S.W.—Machinery	Metropolitan Asylums Board	Board Office, Embankment, E.C.
,, 23	Oswestry—Light Railway	Cambrian Railways Company	A. J. Collin, Oswald Road, Oswestry.
,, 23	Dawlish—Sea Wall	Great Western Railway Company	Engineer's Office, Paddington Station.
,, 24	London, S.W.—Plant	Metropolitan Asylums Board	Handcock & Dykes, 1 Victoria Buildings, Westminster, S.W.
,, 24	Barrow-in-Furness—Cables, &c.	Corporation	O. F. Preston, Town Clerk, Town Hall, Barrow-in-Furness.
,, 26	Brighton—Iron and Steel Work	Town Council	F. J. Tillstone, Town Hall, Brighton.
,, 27	Goole—Extension of Waterworks	Urban District Council	J. C. Mellis, 264 Gresham House, Old Broad Street, E.C.
,, 27	Cirencester—Water Supply Works	Rural District Council	F. Redman, 34 Wood Street, Swindon.
,, 29	Motherwell, Scotland—Dynamos, &c.	Electric Light Committee	J. Burns, Town Clerk, Motherwell.
,, 29	Glasgow—Hoist	Trustees of the Clyde Navigation	G. H. Baxter, 16 Robertson Street, Glasgow.
,, 30	Middlesborough—Plant	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, London, S.W.
,, 30	London, S.W.—Electric Pumps, &c.	Battersea Borough Council	Town Clerk, Municipal Buildings, Lavender Hill, S.W.
	IRON AND STEEL:		
April 19	Valletta, Malta—Pipes	——	Public Works Department, Malta.
,, 20	Halifax—Granite and Setts	Highway and Tramway Committees	Borough Engineer, Town Hall, Halifax.
,, 22	Christiania—Water-pipes, &c.	His Majesty's Consul-General	"Akers Vand-og Kloakvœsens, Kontor," Heimdals, Gade No. Christiania.
April 22	Dundee—Steel Goods	Clothing Committees	Governor, East Poorhouse, Dundee.
	PAINTING AND PLUMBING:		
April 19	Barnstaple—Whitewashing, &c.	Guardians	Master of the Workhouse, Barnstaple.
,, 20	Halifax—Oils, Paints, &c.	Highway and Tramway Committees	Borough Engineer, Town Hall, Halifax.
,, 20	Birkenhead—Painting	Corporation	C. Brownridge, Town Hall, Birkenhead.
,, 20	Salisbury—Whitewashing, &c.	Committee of the Infirmary	J. Harding & Son, High Street, Salisbury.
,, 20	Vicarsford, nr. Leuchars—Plumbing, &c.	——	Tenant of Farm Buildings, Vicarsford.
,, 24	Auckland—Painting	——	C. Johnston, Surveyor, Cradock Street, Bishop Auckland.
	ROADS AND CARTAGE:		
April 19	Hoyland Nether, near Barnsley—Slag	Urban District Council	W. P. Young, Surveyor, Town Hall, Hoyland.
,, 20	Hambledon, Guildford—Materials	Rural District Council	Lintott, Cranleigh.
,, 20	Halifax—Granite Setts, &c.	Highway and Tramway Committees	Borough Engineer, Town Hall, Halifax.
,, 22	Maidenhead—Kerbing, &c.	Town Council	P. Johns, Borough Surveyor, Guildhall, Maidenhead.
,, 22	Newbury—Repairs	Rural District Council	H. S. Talbot, Red Lodge, Cold Ash, Newbury.
,, 22	Rothwell, near Leeds—Material	Urban District Council	J. T. Pears, Council Offices, Rothwell, near Leeds.
,, 22	Whitchurch, Hants—Flints	Rural District Council	S. Clarke, Clerk, Whitchurch.
,, 23	Goole—Wood and Granite Paving	Urban District Council	L. J. Velt, Engineer and Surveyor to the Council, Goole.
,, 23	London, E.—Ballast	Great Western Railway Company	G.W.R. Clerk of Works, Royal Albert Docks, near Connaught Road Station.
,, 23	Croydon—Road repair	Town Council	Borough Road, Surveyor's Office, Town Hall, Croydon.
,, 24	Keighley—Road Works	——	B. Hopkinson & Co., Craven Bank Chambers, Keighley.
,, 29	Edinburgh—Waggons	Corporations Gas Commissioners	W. R. Herring, New Street Works, Edinburgh.
May 1	Litherland, Lancs.—Passages	Urban District Council	W. B. Garton, 25, Sefton Road, Litherland.
,, 3	Ashford, Kent—Road Metal	Urban District Council	W. Terrill, North Street, Ashford, Kent.
,, 6	Crewe—Street Works	Town Council	G. Eaton-Shore, Earle Street, Crewe.
,, 29	Havana—Sewering and Paving	Military Governor	Commercial Department, Foreign Office, Havana.
	SANITARY:		
April 19	Banff, Scotland—Drainage Works	District Committee	G. Cumming, District Clerk, Banff.
,, 20	Halifax—Stoneware Pipes, &c.	Highway and Tramway Committees	Borough Engineer, Town Hall, Halifax.
,, 20	Acome, Yorks.—Sewers, &c.	Great Ouseburn Rural District Council	F. S. Capes, Clerk, Borough Bridge, Yorks.
,, 20	Hindley, Lancs.—Sewers, &c.	Urban District Council	A. Holden, Surveyor to the Council, Hindley.
,, 23	Tanfield, Durham—Sewers, &c.	Urban District Council	R. Heslop, Surveyor, Burnopfield, R.S.O.
,, 23	Keighley—Sewers, &c.	Rural District Council	B. Hopkinson & Co., Craven Bank Chambers, Keighley.
,, 23	Watford—Sewerage Works	Rural District Council	E. Lailey, 1 Market Street, Watford.
,, 26	West Hartlepool—Sewers	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
,, 29	Stromness, Scotland—Sewers, &c.	Town Council	W. R. Copland, 146 West-Regent Street, Glasgow.
,, 29	Thornhill, Yorks—Sewage Purification Works	Urban District Council	S. W. Parker, Council Offices, Thornhill.
,, 27	Altrincham—Sewage Works	Urban District Council	Hinnell & Murphy, 41 Corporation Street, Manchester.
May 14	Ilfracombe—Sewers, &c.	Urban District Council	Engineer and Surveyor, Town Hall, Ilfracombe.
	TIMBER		
April 20	Halifax—Timber	Highway and Tramway Committees	Borough Engineer, Town Hall, Halifax.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
April 30	Keighley—Public Library	£50, £30, £20	W. H. Hopkinson, Borough Engineer, Town Hall, Keighley.
June 10	Ennis, co. Clare—Additions, &c. to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
,, 24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100 respectively	W. H. Talbot, Town Clerk Town Hall, Manchester.
,, 24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
No date	Gillingham—School	£10, £5	E. T. Atchison, 28 Waterloo Road, New Brompton.
,,	Darlington—Row of Shops and Dwelling Houses	——	Borough Surveyor, Town Hall, Darlington.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BECKENHAM.—For the erection of new Council Chambers, &c. for the Beckenham Urban District Council. Mr. John A. Angell, architect :—

Martin, Wells, & Co., Vauxhall	£4,580
Smith & Sons, Croydon	4,492
B. E. Nightingale, London	3,953
Campbell, Smith, & Co., London	3,884
Syms & Duncan, Beckenham	3,870
Perry Bros., London	3,817
Huntley Bros., Croydon	3,778
J. Lonsdale, Swanley	£3,699
F. P. Duthoit, Bromley	3,524
Foster Bros., Norwood Junction	3,453
H. Heathfield, Beckenham	3,395
W. Wallis, Balham	3,225

BRISTOL.—For Cutlers Mills relief culvert, for the Bristol Sanitary Authority :—

W. Underwood & Bros., Dukinfield	£47,580	0	0
W. L. Meredith & Co., Gloucester	45,360	1	6
J. & T. Binns, Croydon	37,665	11	0
R. H. B. Neal, Plymouth	34,000	0	0
S. Saunders, Earl's Court	30,457	0	0
Cook & Co., Westminster	30,369	0	0
G. Bell, Tottenham	28,987	0	0
W. Cowlin & Son, Bristol	26,846	0	0
J. Durnford & Son, Bristol	26,185	0	0
Krauss & Son, Bristol	25,527	0	0
J. W. Smith & Co., Ayrshire	23,781	18	0
E. Nuttall,* Manchester	21,546	11	0

* Accepted.

CAVERSHAM (Oxon).—For the construction of about 2,300 yards of 9 in. and 6 in. stoneware pipe sewers, together with manholes, lampholes, and other works in connection therewith within their district, for the Urban District Council. Mr. S. Percy Andrews, surveyor, 22 Prospect Street, Caversham :—

Johnson Bros., Hereford	£3,956	19	6
W. Thair, East Ham	2,056	5	6
J. Jackson, Plaistow	2,029	8	4
T. Free & Son, Maidenhead	1,921	5	2
F. Talbot, Reading	1,910	17	1
J. Bottrill & Sons, Reading	1,749	7	10
Collier & Catley,* Reading	1,514	0	0

* Accepted.

CROYDON.—For the erection of shop and workrooms, Hedgis Yard. Mr. F. West, architect, Croydon :—

Wagstaff & Sons	£2,098	S. Page	£1,795
Smith & Son	1,978	G. Knight	1,757

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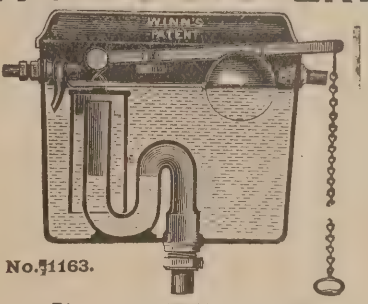

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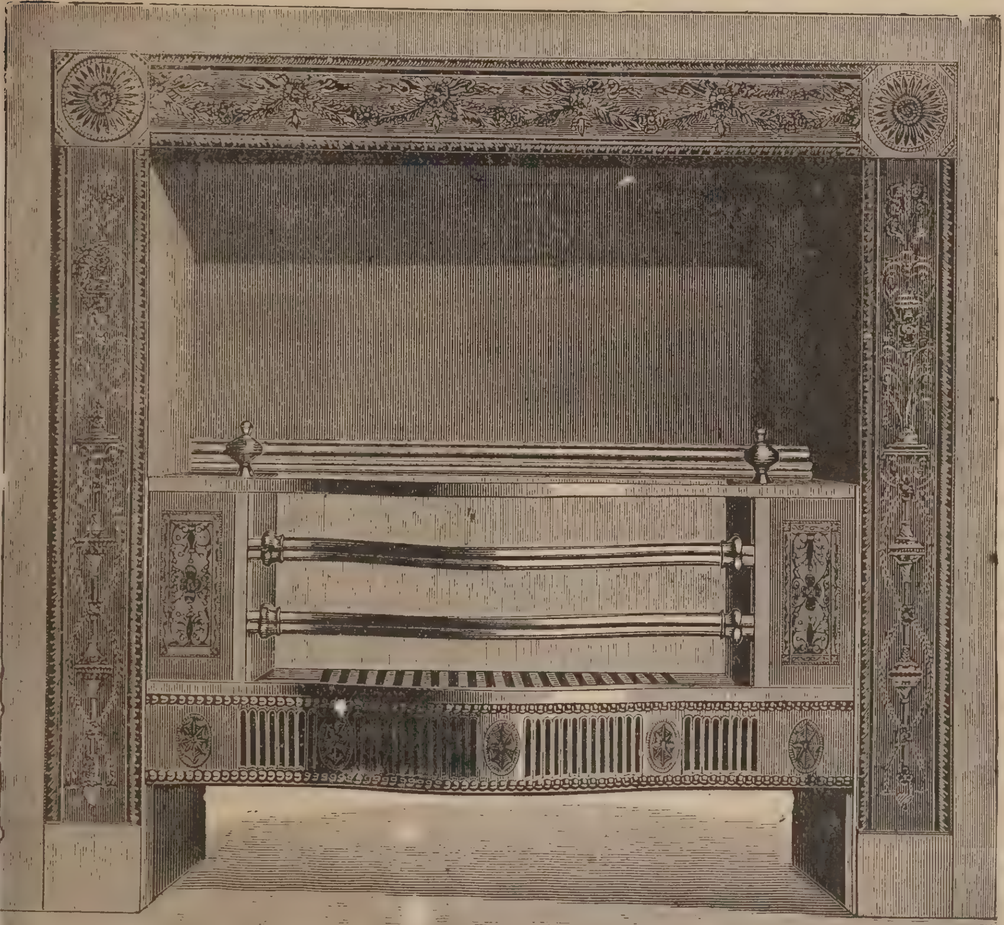

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TENDERS—*continued.*

DUNDEE.—For the construction of a sea-wall, 880 yards in length (in extension of the existing esplanade sea-wall), upon the bed or soil of the River Tay, and relative works, for the Town Council. Mr. Wm. Mackison, C.E., engineer:—

R. C. Brebner & Co., Edinburgh	£45,550	18	3
G. Lawson, Rutherglen	31,887	17	0
G. Mackay & Son, Edinburgh	24,454	0	0
A. Will, Dundee	20,480	18	0
Clark, Simpson, & Scott, Edinburgh	18,780	15	0
T. S. Dick, Broughty Ferry	14,775	19	0
J. B. Hay, Dundee	13,879	3	8
J. McAdam & Sons,* Charlotte Street, Aberdeen	13,568	19	0

* Accepted.

NOTTINGHAM.—For the erection of motor-car works, Canal Street, for Mr. E. R. Bridson. Mr. W. Dymock Pratt, architect, Cauldron Chambers, Long Row, Nottingham. Quantities by the architect:—

E. Hind	£1,840	0	0
Green & Sons	1,809	10	0
J. Lewin	1,802	0	0
G. M. King	1,800	14	5
W. Crane, Limited	1,733	0	0
W. Maule	1,710	0	0
F. Messom	1,670	0	0
A. G. Bell	£1,663	0	0
J. Wright	1,645	0	0
T. Cuthbert	1,645	0	0
Williamson & Co.	1,584	0	0
J. G. Thomas,* Netherfield	1,547	0	0

* Accepted.

RISCA (MON.).—For alterations and additions to the Risca Town School, Risca, for the Risca School Board. Mr. George Rosser, architect, Risca:—

J. Lewis, Pontymister	£1,197
Leadbeter Bros., Caerau Road, Newport	1,088
J. Pritchard,* Pontymister	1,065

* Accepted.

RUGELEY (STAFFS.).—For the construction of sewers, manholes, lampholes, overflow chambers, screening chamber, covered tanks, distributing carriers and chambers, drains, and inspection chambers, and other works in connection therewith, at the Rugeley outfall works, and the vicinity thereof, in the parishes of Rugeley and Brereton, for the Rugeley Urban District Council. Messrs. Pritchard, Green, & Co., engineers, 37 Waterloo Street, Birmingham:—

J. Holme, Spa Villa, Aylestone Park, Leicester	£6,528	4	5
C. J. Nevitt, Stafford	5,781	8	2
G. Trentham, Heathfield Road, Handsworth	5,750	0	0
C. E. Carden,* Penkridge, Stafford	5,679	18	9

* Accepted.

SOUTHMEAD (near BRISTOL).—For the construction of a drainage system and other works for the workhouse at Southmead, near Bristol, for the Barton Regis Board of Guardians. Messrs. W. H. Thorp, F.R.I.B.A., and A. P. I. Cottrell, A.M.I.C.E., engineers:—

R. Wilkins, Surrey Street, Bristol	£2,505	0	0
W. & J. Bennett, 162 Pennywell Road, Bristol	2,210	0	0
Forse & Son, Horsefair, St. James's, Bristol	2,150	0	0
A. Wills & Sons, Spring Gardens, Bath	1,598	0	0
M. Lovell,* Arley Hill, Bristol	1,414	6	10

* Accepted.

DUNDEE.—For the supply and delivery of about 1,540 tons of steel girder rails and 60 tons of fishplates, for the Town Council. Mr. Wm. Mackison, C.E., engineer:—

Orenstein & Koppel London	£12,648	0
W. Scott, Limited, Leeds	12,217	14
Batchelor & Co., Dundee	11,929	0
Bolcklow, Vaughan, & Co., Limited, Middlesbrough	11,727	14
Barrow Hematite Steel Company, Limited, Barrow-in-Furness	11,587	14
Dick, Kerr, & Co., London	10,247	14
Pennsylvania & Maryland Steel Co., U.S.A.	10,209	19
P. & W. Maclellan, Limited, Glasgow	10,167	14
Lorain Steel Company,* Ohio, U.S.A.	9,607	14

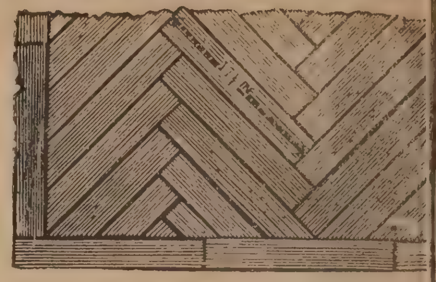
* Accepted.

HEVER (Kent).—For the erection of new isolation hospital at Hever, for the Committee of Hever and other joint districts, Mr. M. M. Smith, architect, 62 Berners Street, W.:—

Lawrence & Sons	£7,253
H. Leney	6,934
Lorden & Sons	6,888
E. Punnett & Son	6,783
K. Avard	6,427
Wallis & Sons	6,319
Davis & Leaney	6,288
Bottrill & Sons	£6,250
Roberts & Co.	6,200
Foster Bros.	6,185
J. Jarvis	6,175
H. Constable	5,916
Ottewell & Son	5,489

LONDON, N.—For the erection of a new junior mixed school at Upper Edmonton, for the Edmonton School Board. Mr. W. H. Dobb, architect, 54, London Wall, E.C.:—

L. & W. Patman, Enfield	£10,870
Patman & Fotheringham, London	10,481
Almond & Son, Ponder's End	9,900
Gregor & Son, Stratford	9,596
Martin, Wells, & Co., London	9,569
Foster Bros., Norwood Junction	9,184
J. Appleby, London	9,130
Lawrence & Son, Waltham	9,093
Willmott & Sons, Hornsey	8,986
Fairhead & Son, Enfield	8,985



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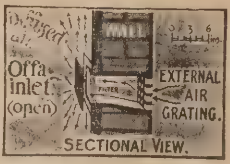

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As our issue is published on the same day as the Exhibition opens, it is of course impossible for us to give a full account of all the exhibits, but by making forward arrangements we have been enabled to compile a goodly number of notices, which we now publish in the form of a Supplement. The remaining notices will be incorporated with those now given, and all will be published in our next issue as a Special Exhibition Supplement.

THE BUILDERS' JOURNAL.

As usual, the BUILDERS' JOURNAL AND ARCHITECTURAL RECORD occupies a stand at this Exhibition (No. 81, Row C, close to the band stand). Here are displayed copies of our own periodical, and also of that finely-illustrated magazine "The Architectural Review," which is also published at these offices. "Specification," which is so highly esteemed by all architects, builders and engineers, is also exhibited. Our representatives will be happy to supply advertisers and readers with all information in any way affecting the publications referred to.

JULIUS HÜLSEN & CO.

Messrs. Julius Hülsen & Co., of Newcastle-on-Tyne, in their exhibit, demonstrate the efficiency of their precipitated carbonate of barytes as a preventative against scum and discolouration in facing bricks, terra-cotta, ridges, quarries, &c. Specimens are shown from the same seam of clay, partly with and partly without an admixture of the carbonate of barytes. Those made without the barytes are scummed, whilst those with which the barytes has been mixed are quite clean and of a good colour. "Linkum" Patent Belting is also exhibited at this stall. This is a belting made up of links punched from manufactured sheets of specially-prepared and highly-compressed fibre. Being made in this way, every link is as strong as its fellow; and as it is claimed that a "Linkum" link is of considerably greater tensile strength than the best leather link of the same section, the belt is very serviceable.

STANLEY BROTHERS, LIMITED.

Messrs. Stanley Brothers, Limited, of Nuneaton, have the following exhibits on their stand:—White and coloured enamelled bricks; improved salt and grey granite bricks, for Board schools, hospitals and public buildings; red and buff chimney pots; brown and glazed cane sinks; ornamental red and buff terra-cotta; glazed socket pipes and connections; semi-encaustic paving tiles; blue pressed bricks, garden tiles, &c.; red ridge tiles, finials, ventilating bricks, &c.; red and buff terra-cotta and glazed vases; roofing tiles, malt kiln tiles; Staffordshire quarries, ridges, &c. This firm has branch works at Burslem and Willenhall, near Coventry, and collieries at Nuneaton and Bedworth.

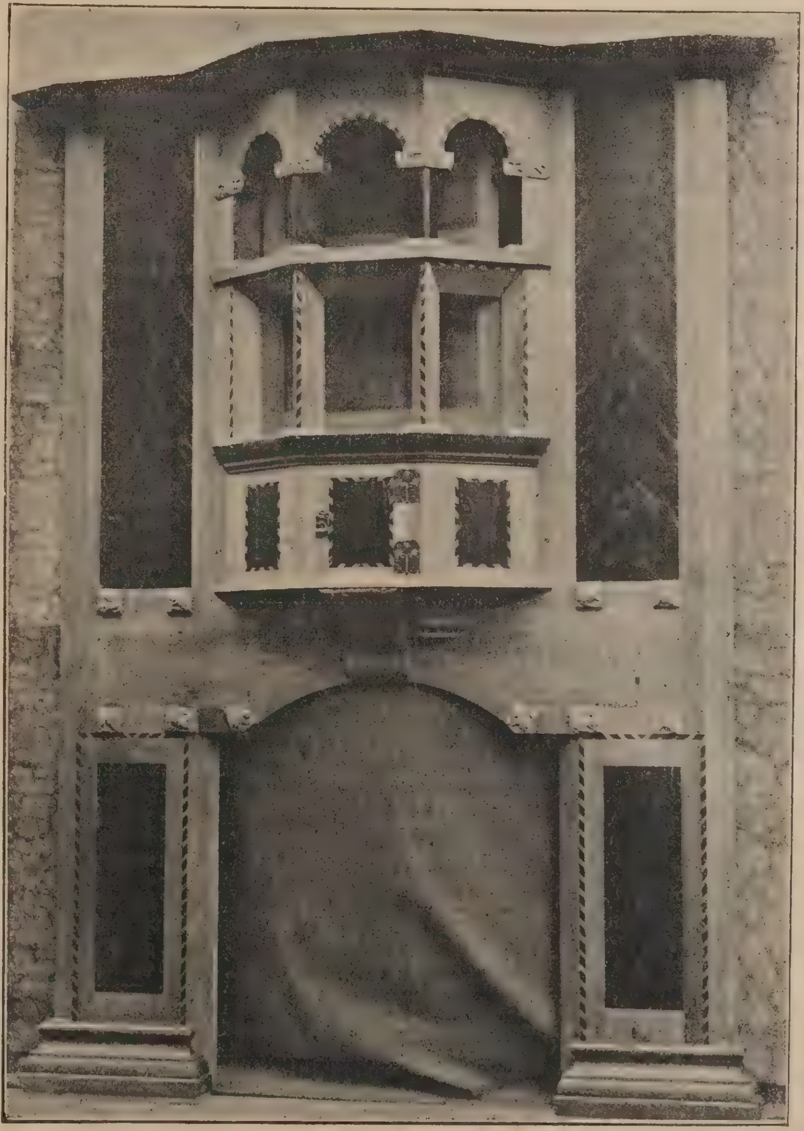
JOHN P. WHITE.

As a maker of beautiful mantelpieces and garden furniture Mr. John P. White, of the Phyghtle Works, Bedford, occupies a prominent place in this country. The exhibits at his stand (No. 68, Row C) are fine specimens of design and workmanship. It is sufficient to mention that he has work from the hands of such men as Mr. H. Wilson, Mr. C. H. Quinnell, Mr. G. M. Elwood, to draw attention to his exhibit. We illustrate a mantel by Mr. Wilson to be seen at this stand. It is in oak with coromandel inlay. Mr. White's garden seats and gates have none of that foolish gewgaw which passes under the name of "ornament," but show a quiet restraint in design which is most desirable for all articles associated with a garden. The "Phyghtle" garden seat (by Mr. Quinnell) is particularly happy in treatment. In his new catalogue of garden furniture, Mr. White says: "The good results produced by my garden seat and gate catalogues, and the recent development in the craft of gardening, have suggested to me that there must be many gentlemen—members of the architectural profession and others—who are anxious to obtain some modern representations of the various quaint conceits and devices which contribute so much to the charm of the Old English Garden." And in this, with the assistance of Messrs. Forsyth & Maule, Mr. Quinnell, and Mr. James S. Cooper, architects, Mr. White has certainly succeeded. We would call special attention to the manner in which these catalogues are produced; they are well printed on good paper, and are illustrated by line drawings of very considerable merit. Roberts' drawing-board rest, fixed by four screws, is also to be seen at this stand.

C. D. MONNINGER.

Saw-sharpening machinery is the special feature of the exhibit of Mr. C. D. Monninger, St. Anna Saw and File Works, 124 and 126, Clerkenwell Road, London, E.C. The improved latest pattern "Climax" band-saw sharpening and setting machine is to be seen at work. This machine will sharpen band-saws of any length up to $2\frac{1}{2}$-in. wide, provided the teeth are not more than $\frac{5}{8}$in. space, and the sharpening is done quite automatically, so that there is a great saving over hand work, to say nothing of accuracy.

The improved saw-sharpening machine for circular saws and mill webs is also to be seen at work. Much prominence is given to guards for dangerous machinery, the Couzens' patent automatic saw guard being shown fitted to Monninger's improved rising and falling top saw-bench. Another exhibit at this stall is the patent "Practical" moulding machine guard fitted on a latest pattern vertical-spindle moulding machine. This is made specially for the use of builders; and as the workmanship and material are of the best, and it is constructed most solidly, it can be employed for the heaviest work with the greatest ease; it can be run at 6,000 revolutions



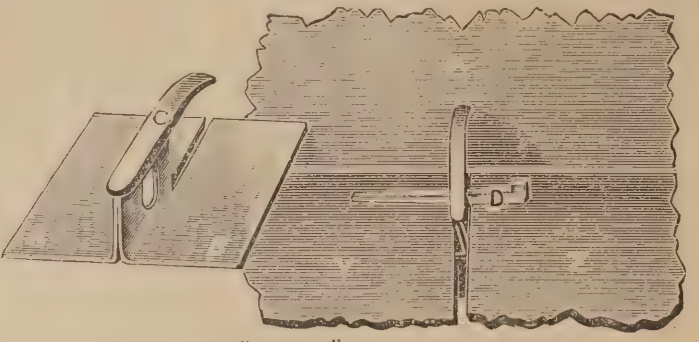
MANTEL DESIGNED BY H. WILSON FOR JOHN P. WHITE.

per minute without vibrating in the least. Monninger's patent hand-feed planing machine guard has recently been still further improved, and is shown fitted to a "Victory" hand-feed planing machine.

Among the numerous other exhibits are improved joiner's and sash cramps, and safety glue-heaters, which meet with the approval of H.M. Inspectors. With regard to these latter, it is impossible for a fire to occur through their use, as the flame does not come in direct contact with the glue pots.

PRYKE & PALMER.

Messrs. Pryke & Palmer, whose offices are at 47 and 48, Upper Thames Street, E.C., have their stand in Row F, No. 123; and among a number of interesting exhibits shown, there is the patent "Perfik" roof-slate fastener, illustrated on this page. For repairs to slate roofs, this is intended to supersede the old-fashioned lead or zinc strips. Its particular advantages are that one fastener binds three slates, that it will not shift by wind or sliding snow, holds the bottom edge of slate down, is scarcely perceptible on a roof, and will not catch or tear workmen's clothes. In fixing the fastener, the damaged slate is first removed, and replaced with a new one, as at X in illustration. The flanges A B of strap are shipped under the old slates Y Z, the part C standing up between. The strap is then pushed upwards until the notch in part C retains the bottom edge of the new slate X. The wedge D is inserted into the hole in fastener, and driven until sufficiently wedged to secure the slate from slipping.



THE PATENT "PERFIK" ROOF-SLATE FASTENER.

Another novelty shown is Fullerton's patent metallic connections for w.c. pans, in lead or brass, with short or long arm connectors.

FLEMING, BIRKBY & GOODALL, LIMITED.

The "Teon" belting made by Messrs. Fleming, Birkby & Goodall, Limited, of Halifax, may be examined at their stand. This belting has been put to several tests, and has proved itself a good article. It is a most suitable belt for trying positions, or in countries where adverse and extreme climatic influences prevail, "Teon" being absolutely unaffected by the rays of the hottest sun, the most humid or steamy atmosphere, or the keenest frost, no matter how constant or interchangeable any of these conditions may be. Tests prove the ability of the belt to resist the action of dry heat up to 230 degs. Fahr., steam up to 200 degs. Fahr., damp, water and open air exposure; also oil, grease, alkalies and acids (with the exception in the last-named of bi-sulphide of carbon and chloride of sulphur). The basis of "Teon" is a specially-woven fabric, made up without joint or seam, thus securing perfect uniformity and evenness of driving. This cloth is built up in piles, then cemented together under enormous pressure. The cement is a secret preparation, and is the prime factor in enabling the belt to resist influences potentially deleterious in their nature. No ingredient used in this cement is influenced by any heat under 230 degs. Fahr.; and even at a higher temperature the cement is equally efficacious in its adhering power, and the "life" of the belt is in no way impaired. Every belt is moreover passed through a specially-devised stretching apparatus, so that practically all "stretch" is taken out, and the total result is a sound, reliable, and high-grade belt.

THE STONEHOUSE WORKS COMPANY.

The Stonehouse Works Company is the engineering business of Mr. Edward Tailby, timber merchant and general woodware manufacturer, of 76, Summer Row, Birmingham. Several saw benches are to be seen at this stall. The improved patent high-speed saw bench exhibited is arranged for cutting and ripping deals and battens at a very high rate of speed, dealing equally well with round timber that has once been broken down. The bench is all in one heavy massive casting, and is fitted with a steel spindle, with extra large pulleys, running in three long gun-metal bearings, the outer bearing being self-contained with the bench, and thus preventing any vibration of the saw or spindle, or heating of the bearings through tightness of the belt. The patent radial arm (which can be fitted to any existing make of saw bench) enables work to be executed with very great rapidity. The machine is also provided with a patent pressure attachment and saw guard.

In the patent self-acting cross-cut saw bench the wood is placed on the table against the fence, and the stop set at the length required, and by the simple movement of the lever the saw travels, cross-cuts, and returns to its position in four seconds, thus enabling a deal about 14ft. long to be cross-cut into six pieces in less than half a minute. Fifteen gross of boards, 36in. long, were cross-cut in one hour; and it is here opportune to mention that these statements are absolute facts, and not misrepresentations. The fence is arranged to turn right over, leaving the top quite clear for ripping.

Tailby's patent planing machine has a patent feed which is instantly turned over for rapid planing, moulding, rebating, &c.; this can be varied by means of change wheels, up to 3,000ft. run per hour, and entirely does away with the great danger of the operator getting his hands in the cutters. The feed can be fitted to any existing hand-planing machine.

The patent hand and steam power central rack rising top saw bench is a handy tool. It will take a 15in. circular saw, and will cut 5in. deep. The fence is adjustable every way, and swings clear over for cross-cutting. Other saw guards and machines are also to be seen at this stand.

FIREPROOF PARTITION SYNDICATE, LTD.

The Fireproof Partition Syndicate, Limited, of 10, York Buildings, Adelphi, W.C., exhibit at Row B, Stand 48, a two-roomed "week-end" bungalow composed of their patent dovetail corrugated metal-sheeting, while a gate-keeper's office is exhibited in the fire-proofing section. The sheets are formed by patent machinery into dovetail grooves, which form an excellent double key for any kind of plastic material, thus rendering them solid, fire-, sound-, damp-, and vermin-proof walls only 2in. thick. The sheet being without perforations, there is no waste of plaster, or any fear in case of fire of flames passing through after the plaster has fallen away from intense heat. The roofs of the buildings shown are also made with the patent sheeting, plastered, with tiles embedded. The saving in space in a building where these partitions are used means a nett gain of 4in. on each partition. One partition saves 4in.; two, 8in.; three, 12in.: thus, with three partitions, saving 1 cubic foot through the entire building, as the 2in. partitions are equal in strength to a studding partition 6in. thick. The firm also show samples of paten fireproof floors, constructed on a similar principle. They can be both cheaply and speedily erected, and can be plastered immediately if required, while it is claimed that the weight per foot super. is considerably less than that of any other fireproof floor on the market to-day.

GEORGE PRICE, LIMITED.

All those in need of a good safe should inspect the "Twentieth Century" bent steel side-locking safe to be seen at the stand (in the Fire Prevention Section) of Messrs. George Price, Limited, of Wolverhampton. The outer shell is bent cold by powerful hydraulic machinery out of a single steel plate, from ¼in. to ½in. thick, so that the corners are solid and jointless. Back plates, of ¼in. to ½in. steel, are put in from the front and firmly secured to steel flanges overlapping the backs. The door frames are of special section T-steel, absolutely wedge-proof. Doors are of ⅝in. to 1in. solid steel. The safe is lined throughout with 3¼in. chambers, tightly filled with improved steam-generating composition. Chambers on doors, 4in. to 5½in. thick, are filled entirely with fire-proof composition. The doors are secured at the back by a continuous bar, which, when the door is closed, passes behind the solid web of the T-section door frame. The fronts of the doors are fitted with wedge-shaped dowels slotted out at their front edges, which pass through corresponding openings in the door frames. The safe is locked automatically without applying the key to the lock. The act of pulling the handle to the right causes the locking bar to slide up the slots in the dowels, and the safe is made secure. The T-steel frames of the safes in which the lock and locking mechanism are fixed are "case hardened," and protect the locks from drilling at all points. In the better qualities the doors are "case hardened," and are drill and sledge-hammer proof; they are also banded back and front with endless wedge-proof bands shrunk on hot like the tyre of a wheel, and securely covering up the rivets and screws. The "Twentieth Century" strong-room door can also be inspected at this stand. This also locks on the side, has a 5½in. fireproof chamber on the door filled with fireproof composition, and is constructed in a similar manner to the safe above described. The firm has been established for more than fifty years, and has supplied safes to H.M. Board of Works, War Office, Admiralty, Bank of England, foreign Governments, and numerous large companies.

STANDARD SANITARY MANUFACTURING CO.

The Standard Sanitary Manufacturing Co., who exhibit at Stand No. 82, Row C, have opened London showrooms at 22, Holborn Viaduct. The head office of the firm is at Pittsburg, U.S.A., but they have established branch offices and agencies in all the principal cities of the world, and are now placing on the market high-class porcelain enamelled baths, lavatories, and similar goods. The "Standard" baths were awarded the only Grand Prix at the Paris Exhibition of 1900, and also the gold medal of the Department of Hygiene and Social Economy. The firm control practically every cast-iron enamel bath made in the United States, but none of the plants so controlled produce the bath styled "Standard," which is made only at the works in Allegheny, and under a secret process not granted to the other plants. The following is a specification of an "Elysian" bath: White enamelled bath tub, with 3in. enamelled roll rim; brass common overflow connected with nickel-plated overflow; waste plug with rubber stopper; width, 23½in.; depth, 18½in.; height from floor, 24in.; length over rim, 4ft. 5in.; length inside, 4ft.; price, £7 5s.

Mr. Leon N. Loeb is the general manager for the United Kingdom.

MOORE'S PATENTS COMPANY, LIMITED.

The exhibit of Moore's Patents Company, Limited, Nightingale Hall, Lower Edmonton, N., is to be seen at Row C, Stand No. 65. When the sashes of Moore's patent vertical sliding sash windows are at the bottom they are always hinged, and then a person standing inside on the floor can, by moving a handle, turn them inside and paint, repair, or clean the outside, and replace them, as easily as an ordinary door is opened and closed, without steps, poles, risk of accident or detachment. These sashes cannot be opened inwards until they are down and hinged, and when turned inwards for cleaning or full, ventilation, they cannot become unhinged, or get wrong when being replaced. When specified of similar material and shape they cost no more to make than ordinary windows.

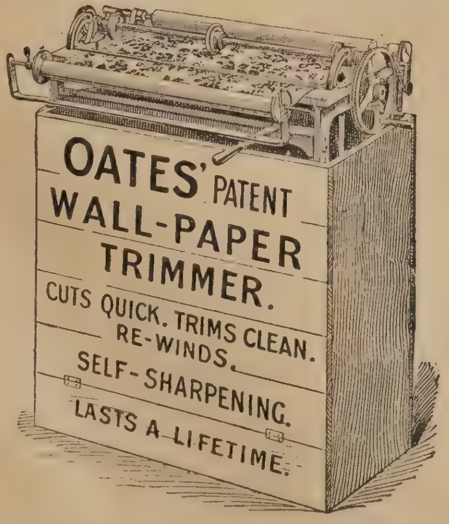
Both frames in Moore's patent casement windows are exactly the same as in ordinary casements, opening outwards, with solid or nailed-down beadings. By moving a catch on the inside with the finger when the sash is open, the outside will turn inside for cleaning; the sash can be replaced, and the catch pushed back, with great ease and rapidity. When fitted with a non-rattling stay and catch they cost only a trifle more than the ordinary casement. Other exhibits at this stand are: Patent fanlight or skylight openers, two-way door springs and hinges, and one-way door springs. The two-way door springs are screwed on the floor (without cutting a hole for them) and on the bottom of the door, and are almost invisible. They have a screw adjustment to suit them to heavy or light doors, and the wearing part runs in oil.

T. FEWSTER WILKINSON.

Mr. T. Fewster Wilkinson feels that as the present form of stairs has been in universal use since very ancient times (possibly since the Pyramids of Egypt were built) there will be a good deal of inherited prejudice to overcome in the adoption of his own patent stairs. These are designed to combine easier risers with wider treads than can be arranged on the ordinary system, and instead of being level across the whole width of the stairs the treads alternate to the right and left. Handrails at each side guide the person in the centre of the staircase, and he places his left foot on the left-hand steps and his right foot on the right-hand steps. There is one more riser on the left-hand side (looking upwards) than on the right-hand side, so that both the ascent and the descent begin with the left foot, as a soldier does in marching. At an angle of 45 deg., the risers and treads can be in the following proportions: 5½in. by 11in., or 6in. by 12in., or 7in. by 14in.; instead of equal risers and treads, as in the ordinary system. At lesser angles easier risers and wider treads can be provided. The stair exhibited is at an angle of 50 deg.; there are eleven risers for a height of 5ft. 0½in., each riser being only 5½in. high; the treads are 9¼in. wide; the "going" is only 4ft. 2⅞in. The stair exhibited has been made with unusually easy risers for the purpose of showing the vast difference between the new system and the ordinary stair delineated on the outer side of the string-board, having seven risers, each 8⅝in. high, and treads only 7¼in. wide. Mr. Wilkinson's address is Bartle Garth, Reepham-by-Lincoln.

J. OATES.

The exhibit at Stand 31, Row A, consists of a number of "Empire" patent wallpaper trimming machines made by Mr. J. Oates, of 24 George Street, Huddersfield. These are shown in operation, edging all kinds of wallpapers, from common pulps, grounds, and sanitaries, &c., up to Anaglypta; and that so expeditiously and at the same time so accurately, that visitors cannot help being struck with the great difference between the results obtained by the use of this neat little labour-saving machine and the old-fashioned, slow, and tedious method of work with hand scissors; indeed, the latter method must finally become a thing of the past, as an ever-increasing number of these wallpaper trimmers are being used throughout the Kingdom and abroad. The 1901 model shown at this stand embodies the very latest improvements in trimming machines.


OATES' PATENT
WALL-PAPER
TRIMMER.
CUTS QUICK. TRIMS CLEAN.
RE-WINDS.
SELF-SHARPENING.
LASTS A LIFETIME.

A. T. COOPER.

Mr. A. T. Cooper, of 92, Moray Road, Finsbury Park, London, N.W., is the inventor and patentee of a patent suction and vacuum pump which has been submitted to many severe tests by competent authorities, and has given satisfaction. On December 16th, 1893, a War Office test was made at Wellington Barracks. A tier of latrines was choked. The pump was set to work and withdrew a full-size lemonade bottle in one minute. A manhole was also cleaned in the same time. On another occasion a test was made with a large gulley outside the married quarters at Lincoln Barracks. From a 4in. outlet the pump withdrew a child's wooden sand spade 15in. long, and on the same day also cleared a very obstinate obstruction in the laundry drain. In the course of a test with a set of three closets at Netley Hospital, the pump withdrew the third of a dinner plate in five minutes. The pump is therefore of ample strength. The London School Board have 100 of these drain clearers in use, while the Commissioners of H.M. Prisons have provided the whole of their prisons, 60 in number, with Cooper's Patent Drain Clearers. H.M. Office of Works is also supplied throughout with them. The exhibit at this stand also includes Cooper & Bryant's patent "Clincher Lock of the Future." The bolt has an opening at the end which slides over and clinches the catch firmly, fastening the door so that it cannot be prized open from the outside. A locked shutter is also provided to protect the keyhole.

WATERPROOF CEMENT COMPANY.

Waterproof cement is a material as yet imperfectly known on the English market, but it is one deserving the earnest consideration of architects and contractors. It is exhibited at the stand (No. 137, Row F) of the Waterproof Cement Company, who have works at Brentford and offices at 6, Millbank Street, Westminster, S.W. Portland cement mixed with this composition becomes impermeable to water. The material is used under ordinary conditions, no heat being required for mixing. Frost will not affect it when properly mixed and set, and it is so compact as to be practically imperishable. It is specially applicable to reservoirs, cellars, barracks, ammunition magazines, fine-art galleries, libraries, damp-proof courses, plastering, pointing, and positions where exposure to damp renders ordinary cements unreliable. The longer it is set the harder it becomes, and the colour may be varied so as to harmonise with existing fabrics. This waterproof cement takes paint readily, and can, if desired, be faced with ordinary Portland cement. Samples will be forwarded on application, and the company will be pleased if these be submitted to any practical tests that may suggest themselves. The amount used in combination with Portland cement and sand forms about 10 per cent. of the bulk, and the cost is about 10 per cent. more. The cost, £12 10s. per ton, free on rail, in lesser quantities 14s. per cwt., is thus very nominal in view of its waterproof and lasting quality. Packages are charged at cost, credit being given on return in good condition within two months, carriage paid.

Samples are also exhibited on this stand of the "Standard" damp-proof composition. With a lining of this material properly applied, a guarantee is given that no house or place will show evidence of damp. It is applied in a molten state, and sets quickly. The result is a rock-like mass, without fissure, absolutely impermeable to water. It is a non-conductor of heat and sound, does not harbour disease germs, and is positively vermin-proof. The "Standard" composition is sent out in blocks or in bags. Its price is £5 5s. per ton, free on rail, lesser quantities at 6s. 6d. per cwt.

MELDRUM BROS., LIMITED.

The exhibits of Messrs. Meldrum Brothers, Limited, of Atlantic Works, City Road, Manchester, will be found at Stand No. 109, Row E. The specialities exhibited are the "Meldrum" forced draught furnace, the "Koker" stoker combined with forced draught, and refuse destructor.

The "Meldrum" forced draught furnace is suitable for all types of steam boilers, and is very largely used at brick and tile works, as well as at every other description of works where steam power is employed. The chief advantages of these furnaces are: (1) For greatly increasing the steam power of the boiler beyond what natural draught will give; (2) for effecting economy by the use of cheap fuel; (3) for overcoming defective chimney draught; (4) for minimising the emission of smoke; and (5) the cost of upkeep is exceedingly small, even the bars lasting for years.

The "Koker" stoker combined with forced draught is adapted for mechanical feeding on the coking principle, and the combination gives results claimed to be in advance of any other mechanical stoker, especially as regards high boiler duty, fuel efficiency, and smokelessness. Stokers have been fitted for a number of the largest steam users in the country, and Messrs. Meldrum Brothers have a large number of them in hand, including twenty-two boilers for one large firm, eighteen boilers for another, and many other important orders.

Refuse destructors are now being erected by this firm for numerous cities and towns in England and Scotland, besides which there are a good number already at work. The main advantages of the Meldrum system are that it destroys the refuse entirely without any objectionable fumes or nuisance of any kind, and at the same time produces the highest possible steaming power from the refuse, this steam being used for electric lighting, sewage pumping, or other useful municipal purpose. The high temperatures maintained in the destructors ensure the thorough cremation of the fumes &c.

H. J. & C. MAJOR, LIMITED.

Majors' patent waterproof roofing tiles are the leading feature of the exhibit of H. J. & C. Major, Limited, of the Patent Tile Works, Bridgwater, at Stand No. 106, Row E. The various patterns of these tiles are well known for their general utility and efficiency, combined with economy. Their adaptability for buildings of every description has been shown by the adoption of them by leading architects, and by the demand for them by landowners, contractors and builders for all kinds of roofing purposes in the United Kingdom, the British Colonies, and foreign countries. The general assortment of ridge tiles, paving bricks, oven bricks, ornamental, and other building bricks deserves special attention, as well as the roofing tiles above referred to. Messrs. H. J. & C. Major, Limited, have been awarded the highest and only award for roofing tiles in every competition in Great Britain and Ireland since 1884, and also the highest and only award for roofing tiles at the Paris Exhibition, 1900.

CROSSLEY BROTHERS, LIMITED.

The exhibit of Messrs. Crossley Bros., Limited, of 10, St. Bride Street, E.C., in Wall Space No. 124, consists of the following engines: One type "U" gas engine of the latest pattern, capable of developing 33 effective h.p. as a constant working load. One type "OE" high-speed electric lighting gas engine fitted with one specially heavy fly-wheel, supported by outside bearing. This engine is capable of developing 12½ brake h.p. as a constant working load, and is used for driving a dynamo for lighting this stand. A perfectly steady light can be obtained with this type of engine, without accumulators. One type "JJ" oil engine, capable of developing 1½ brake h.p. as a constant working load. The "U" type above referred to drive the brick-making machinery on the adjacent stand of Messrs. Thomas C. Fawcett, Limited, engineers, of Hunslet Road, Leeds. Also, in addition to the above, there is one of the "M" type gas engines, capable of developing 7 brake h.p. as a constant working load, on Messrs. Pullman and Mann's Stand, Leeds; and an "S" type engine, giving 20 brake h.p., on the stand of Messrs. Bradley & Craven, of Wakefield.

SHEPWOOD & COMPANY.

The "Shepwood" patent partition brick, made by Messrs. Shepwood & Company, of Lindisfarne, Walton-on-Thames, can be inspected in the Fire Prevention Section of the Exhibition. It has hollow spaces passing vertically through it, so arranged that when the bricks are placed over one another with bonded joints the spaces are continuous. It is claimed that a partition constructed with these bricks, finishing 2½in. thick, is as rigid as an ordinary 4½in. wall; it will support itself across a wide span, and may be used in place of fire-spreading lath-and-plaster partitions, and for closet and lavatory divisions, articles and dormitory partitions, where space is valuable. The size of the bricks is 13½in. by 6in. by 1⅞in. thick. No ironwork is used in construction. These bricks have been used in numerous important buildings, such as the North-Eastern, St. George's, and St. Thomas's Hospitals; the Stock Exchange; Bank of Scotland, Bishopsgate Street; Victoria Theatre, Manchester; and Pitman Schools, Southampton Row.

S. T. CLOTHIER.

Mr. S. T. Clothier, quarry owner and stone merchant, of Street, Somerset, exhibits at Stand No. 34, Row A, flags, steps, and kerbs of Keinton stone, a very fine-grained blue-greystone. Flags and kerbs of this stone are very suitable for public footpaths, and are in use throughout the Midlands and South of England for this purpose. The rubbed flags for paving public buildings of all kinds have been used in the Royal Courts of Justice, Strand; and for tennis and racquet courts at Princes' Club, Knightsbridge, the University Club, Cambridge, Sir A. Noble's, &c. Their price is 1s. per ft. cube at the quarries, which are at Keinton, Somerton, and Street, in Somersetshire.

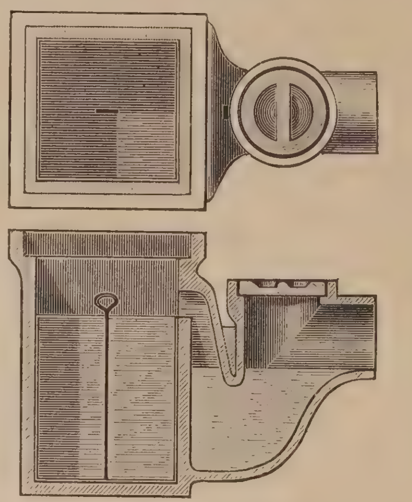
Blue and grey blocks are also shown of forest stone, a fine grained blue and grey sandstone, suitable for steps, landings, monumental and general architectural purposes, in general use throughout the Midlands and South of England. The price of this stone is 2s. per ft. cube at the quarries, which are at Knockley, Darkhill and Gosty Knoll, Forest of Dean, Gloucestershire.

HOULDSWORTH'S PATENT BARROW COMPANY.

The exhibits of Messrs. Houldsworth's Patent Barrow Company, of Park Lane, Keighley, at their stand in a Gallery bay, consist of barrows and barrow fittings. One of the great faults in ordinary barrow wheels is the constant repair necessitated by the failure of the axles. In Houldsworth's patent wheel it is claimed that this is entirely obviated by making the axle of the wheel really of two-flanged axles of steel bolted through the stays, which are of wood, and form a cushion to the axle. As the axles work in patent Bush bearings, the liability to get out of order is reduced to a minimum. The wheel is stated to always run true and to outlast several of the usual make. The Bush bearings referred to are driven in with a hammer into the usual hole bored in the axle block. Barrows can be fitted with patent adjustable bearings if required.

JOSEPH PLACE & SONS, LIMITED.

The chief exhibits of Messrs. Joseph Place & Sons, Ltd., of Darwen, Lancs. (who occupy Stand No. 135, Row F), are the "Adi" and "Zaza" chimney pots, the patent kiln bottoms, and Place's patent street gulley. The "Adi" and "Zaza" chimney pots are designed to prevent smoky chimneys, by means of having double-arms and louvres, the former with the louvres below the arms and the latter with them above. In the "Adi," when there is a direct down-draught, the wind rushes in at the top and out at the side arms, thus creating a vacuum in the flue. The smoke ascends the flue to fill this vacuum, and is driven out at the side arms. The stronger the wind that falls on the top of the chimney, the better the chimney pot answers. The "Zaza" chimney pot should be used where the wind re-bounds from a high building; as the "Adi" will not in all cases answer under these conditions. The "Zaza" increases the up-draught and prevents a down-draught. The patent chequer bricks for kiln bottoms give increased strength and decreased solid on floor level; rubbish cannot lodge on the supporting walls, nor between the chequers, the supporting walls are tied together and lateral movements are prevented, and a 4-in. pipe can stand anywhere and still have free draught. These kiln bottoms should be seen to be appreciated. The special advantage of the patent street gulley, which is illustrated on this page, is that by the arrangement of the outlet the whole depth of the gulley is utilised for sediment, and still the outlet and gulley are accessible in every part. This distinctly advantageous arrangement is stated to be quite as cheap as the ordinary gulley. Samples of white enamelled and special salt glazed bricks are also shown; these are made from the firm's "diamond" stoneware clay, which enables a brick to be made perfectly true on the bed and still get the same high glaze as other makers.


PLACE'S PATENT STREET GULLEY, NO. 249.

MOFFATT & EASTMEAD, LIMITED.

Moffatt & Eastmead, Limited, lift manufacturers, of 39, Victoria Street, S.W., occupy Bay No. 5. Here may be seen an electrically driven warehouse lift, the hoisting machine being fitted with a self-sustaining shaft in place of worm gear, and having an automatic mechanical stop action provided to prevent overwinding. A patent self-sustaining hand-power goods lift which requires neither brake nor brake rope (as soon as the operator releases the hand-rope, or should the latter come off the wheel, or break, the cage remains stationary and will not run away even when fully loaded). A patent self-sustaining hand-power dinner lift for flats and private houses. Improved patent automatic safety gates for protecting the entrance to lifts. A belt driven dispatch sack hoist for granaries, breweries, stores, barrow hoisting, &c. A self-sustaining hoisting crab which dispenses with both brake and ratchet, and will not allow the handle to fly back. The warehouse lift and sack hoist are shown working, and are driven by a 3-h.p. electric motor supplied by the General Electric Company, Limited. Another exhibit is one of Moffatt's improved 1900 patent feed-water heaters and fuel economisers for steam boilers. This heater, by which dirt, lime, salts and other impurities are prevented from entering the boiler, is very compact. Each of the internal tubes is fitted with an independent expansion joint, and when utilising the exhaust steam from a steam engine it will deliver water into a boiler at from 206 degs. to 208 degs. Fahr., the water being purified and softened in its passage through the heater. A large number of these heaters are in use in breweries, factories, laundries, &c.

In designing their hydraulic lift Messrs. Moffatt & Eastmead's main object has been to secure safety and economy. The former has been attained from results gained in actual practice, and the latter by reducing the number of parts to a minimum, rctaining only those necessary to efficient working.

L. LEWIS & Co.

Messrs. L. Lewis & Co., of 51, Shirland Road, Paddington, W., are the manufacturers of the flexible damp-course, patent mastic roofing felt and slaters' felt to be seen at Stall No. 17, Row A.

The damp-course is manufactured by a chemical process, and is not liable to crack or ooze out under pressure. It is manufactured in lengths of 33ft. (widths to order), thus having an advantage over 32in. slabs and saving from 25 to 30 per cent. in material and labour. It can be rolled along the wall and kept down to the mortar, avoiding frequent overlapping, in which case it would not be a true damp-course, whereas if cut in slabs it would take 12 overlaps of 3in. each, or 36in. in all.

The flexible mastic roofing felt is manufactured on the same principle as the damp-course. Messrs. Lewis claim that this felt is much superior to the ordinary straw or fibrous felt, both in strength and durability. Their felt is largely used for roof covering (under slabs or tiles), and being of close texture insects cannot penetrate it. Sparks or lighted matches falling on it will not affect it. By reason of its cheapness and portability it is particularly adapted for shipment to the Colonies, while its non-conducting quality renders it effectual in resisting the sun, the cold winds and the winter frosts. The mastic slaters' felt is manufactured on the same principle as the roofing felt, but is thinner in substance.

The price of the mastic damp-course, extra quality, 9in. wide, is 4d. per lineal yd. in rolls of 11yds. The roofing felt costs 5s. 6d. per roll of 11yds. by 39½in. wide (contents about 108ft. super.). The slaters' felt, 11 or 22yds. long, 39½in. wide, costs 3s. and 6s. respectively (contents of rolls about 108 and 216 super. ft.).

These goods have been supplied to the War Office, Admiralty, General Post Office and other Government offices.

H. C. SLINGSBY.

The patent trucks made by H. C. Slingsby, of 142, 144, 146, Old Street, E.C., where there are 20,000 sq. ft. of show-rooms, are too well known to need much description. They are obtainable in various sizes for all trades, run both ways, spin like a top, and have a sliding wheel at each end. A number of these trucks are shown—being a selection from 400 styles and sizes listed, and 1,000 styles and sizes to be seen—at 142, 144, 146, Old Street, E.C., which is the new address of the firm. The offices were formerly at 30, Gray's Inn Road, E.C. Mr. Slingsby's exhibit occupies Wall Space 157.

Visits and Meetings during the Exhibition.

The following is a list of the visits and meetings that will take place during the time the exhibition remains open, from April 17th to the 27th:—

Friday, 19th.—Visit of Institute of Builders.
Saturday, 20th.—Visit of Architectural Association.
Wednesday, 24th.—Visit of Institute of Sanitary Engineers.
Thursday, 25th.—Visit of Society of Architects. Annual meeting and dinner of Institute of Clayworkers.
Friday, 26th.—Conference on standardising of bricks, at 4 o'clock.

In respect to the standardising of bricks, this Conference has been arranged jointly by the Royal Institute of British Architects, the Institution of Civil Engineers, and the Institute of Clayworkers. The chair will be taken by Mr. Thomas Blashill, F.R.I.B.A. Anyone desirous of attending this meeting may obtain admission to the Hall upon application to 43, Essex Street, W.C.

A party of fifty Germans engaged in the building industries will pay a ten days' visit to England for the purpose of seeing the exhibition. They will be entertained at a banquet at the Hall by the Institute of Clayworkers on the Thursday evening, April 25th.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

APRIL 24, 1901.
No. CCCXXIV.

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An Architectural Causerie.

Scenic Art. THE past week has been remarkable for two utterances on the interesting topic of scenic art. The revival of "Coriolanus" by Sir Henry Irving at the Lyceum Theatre has, naturally, excited the attention of stage enthusiasts, and the production gains an enhanced interest from the fact that Sir Laurence Alma-Tadema, the artistic authority on Rome and Romans, is responsible for the scenes and dresses. In a chat with a "Daily News" interviewer Sir Laurence showed very clearly that in his opinion dramatic action gains from suitable surroundings, an opinion with which the majority of playgoers will be prepared to agree. It is interesting to note that the designs for "Coriolanus" were prepared about twelve years or so ago, and the scenes as now presented at the Lyceum are, with slight exceptions, identical. Sir Laurence pays a tribute to Shakespeare's genius in entering into the spirit of the times he depicted, and states that many things which the poet conjectured have been established by subsequent researches. Mr. Percy Fitzgerald's paper upon the true principles of stage scenery, read before the Society of Arts, takes an entirely opposite view, and is not by any means so conclusive. Mr. Fitzgerald ridicules many of the devices used to produce illusion in theatres; but the theatres from which he has collected impressions would appear to be third-rate provincial houses in which the scenic accessories of travelled-stained "fit-up" companies usually find a home. To attribute such a standard to the productions of Her Majesty's and the Lyceum theatres is simply a travesty of reasoning. No one, we presume, would argue that scenic art has yet attained perfection; but the efforts of our leading managers to produce illusion in this direction have naturally fostered inventive talent, and led to the appearance of new methods and new material. There are yet difficulties in the way of "sky-borders" and other unruly details which require improvement; but we have little doubt that these difficulties will ultimately be surmounted. Mr. Fitzgerald cannot find any virtue in built-up scenery. "No dramatic advantage was secured by making people ascend or descend flights of steps, or cross bridges, or enter the porch of a church, as all those operations could be described or suggested." Mr. Fitzgerald does not show how these operations could be described or suggested; and we cannot imagine any attempt to do so that would not excite the ridicule of the audience.

But on the general statement we join issue. The "processional" part of a play has a distinct dramatic advantage in creating an "atmosphere." To prove it we can take one or two examples. In Mr. Tree's production of "King John" the curtain rose on an empty stage, save for one attendant standing at the head of the staircase in full view of the auditorium. The pealing of the organ, the entry of the chanting monks, the acolytes with swinging censers, the procession of the Court down the steps, all contributed to dramatic action in carrying the minds of the audience away from the small-talk of the nineteenth century to the spirit of a time centuries back, when religion, more feared than believed in, dominated the lives of the people.

Similarly, the spectacle of the mad king Herod, clothed in rags amid the splendour of his court, stricken with catalepsy by his wife's bier, with the Roman envoy offering him kingdom, titles and sceptre that his palsied brain and hands cannot grasp, presents a scene of dramatic pathos which could not have been realised without the wealth of detail which Mr. Fitzgerald decries.

Only in regard to stage-lighting are we at all in agreement with Mr. Fitzgerald, though this branch of stage art is not quite so advanced as the lecturer assumes. Still, when one considers the moonlight scene in "Herod," and the Agincourt scene in Messrs. Mollison & Waller's production of "Henry V.," there is every reason to believe that stage-lighting is receiving its proper share of attention in the development of stage art.

S. MARIA IN ORGANO, VERONA. SANMICHELI, ARCHITECT.

The Dowdeswell Galleries. WATER-COLOUR drawings by Mr. and Mrs. Harry Hine, of castles, abbeys and minsters, are now shown at these galleries. When artists are husband and wife the latter can seldom, if ever, be correctly described as the better half; and seeing the paintings of Mr. and Mrs. Hine together we feel, as might be expected, that the husbands are almost invariably better—more masterly, if one may say so. Distinction of line is a *sine qua non* when the subject selected is a building, or group of buildings, and this, more than anything else, is felt to be lacking in Mrs. Hine's paintings. But the difference is not, after all, so great as to justify our speaking of this as an undesirable partnership, and what remains to be said relates to the whole collection. They have travelled almost over England, not needing to be told that their buildings are beautiful, nor exactly what should be selected. The minster, passive, unchanging, but never the same to the painter—from dawn till the evening he works, and in this ever-changing climate he cannot have wanted variety. It should help architects to better their best to know that there are infinite possibilities of delight in buildings of every sort, and it is hoped that many may have opportunities of seeing, as they may here, in what esteem even the lowliest of their achievements are held by lovers of art, and by those who speak for them—the painters. They have gone as far north as Richmond in Yorkshire, as far south and west as Wimborne and Wells, and it is almost impossible not to feel envious. If the view of "Christchurch: Evening," is said to remind us of Albert Goodwin, it is because no praise could be higher; but there are drawings which stand alone in their excellence, suggesting no sort of comparison excepting with the spectator's ideal, and losing little or nothing thereby. Wimborne Minster, from the Meads; St. John's College, Cambridge—the well-known view from the "Backs"; Dunstable Priory; Pul's Ferry, Norwich; St. John's at Madder Market, Norwich; Hatfield House, from the Park; the Guildhall, King's Lynn, Norfolk—there is something in these that must deepen our feelings of reverence; and members of the many societies that have combined to oppose the spoliation of buildings hallowed by Time should spend a half-holiday here.

Plate Glass. PLATE glass, the creation of comparatively recent times, is responsible for many of the enormities which render the street architecture of to-day so devoid of grace and harmony. This subject has now become somewhat hackneyed, but despite all that has been said against the manner in which it is used, architects continue to emphasise the ugliness of their buildings by inserting great panes of what we know is a brittle, fragile material, and not therefore one to—apparently—support great masses of masonry and stone. It is always of special interest, in studying the development of architecture in any country, or part of a country, to note how local conditions govern the features of the style; and this is specially true of plate glass, though it would perhaps be too foolish to speak of the ordinary shop premises as being in a "style." There are those among us who are for ever harping on the despicableness of everything around them, and of the universal beauty of the work done by our forefathers. Doubtless there is much truth in their argument, but it helps us little in the effort to ameliorate our own conditions and improve our own productions; we are tired of their grumblings. Those, however, who contend that a house-window glazed with small panes—even those so popular at the beginning of the nineteeth century, about 12in. by 15in.—is much more pleasing in appearance than one glazed with one great sheet, are, we think, quite in the right. The work of cleansing is increased, it is true, but the slight additional trouble is well repaid. One cannot expect a modern shop front to be divided up into panes—nor would it be desirable perhaps—but a great improvement would be effected if the panes finished a couple of feet from the ground instead of running down to a thin brass rim on the pavement, being held vertically by an absurdly thin strip of brass or wood.

SANMICHELI AND HIS WORK.*

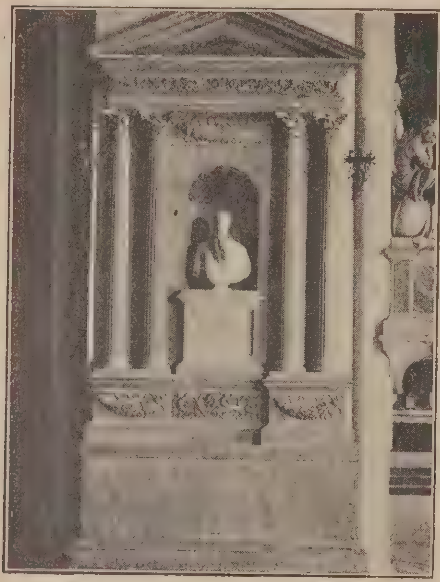
By J. STUART SYME.

IN taking up the study of the Renaissance architecture of Italy, or any particular phase of it, one comes face to face with a great conflict of opinions on the subject. There are those who condemn it more or less out and out, like Ruskin. There are those who revel in the fifteenth-century work of Florence and Tuscany, and such luxuriant examples as we find in the Certosa at Pavia. Some, again, fall down and worship the architecture of Michelangelo as devoutly as Mr. Fergusson the historian condemns it.

It is not proposed here to view the subject in the spirit which praises one phase of an art movement to the exclusion of all those others with which it is necessarily connected. It is suggested rather that we consider Sanmicheli and his work without prejudice to any admiration we may have for any other architect or school, whether of the Renaissance or not.

It might not be unprofitable to expend at the outset a few thoughts as to the questions which should have weight in an endeavour to determine the artistic worth of a man and his achievements. It is a question whether it is quite fair to accord our admiration, or the reverse, to an artist without considering the circumstances which helped to produce his art. We are, perhaps, a little inclined to lavish praises on an artist who produced specimens of his art which accord with our æsthetic ideas, and to overlook those circumstances of environment which, while shaping the road for our favourite, directed the energies of others in a direction in which it does not suit our humour to travel.

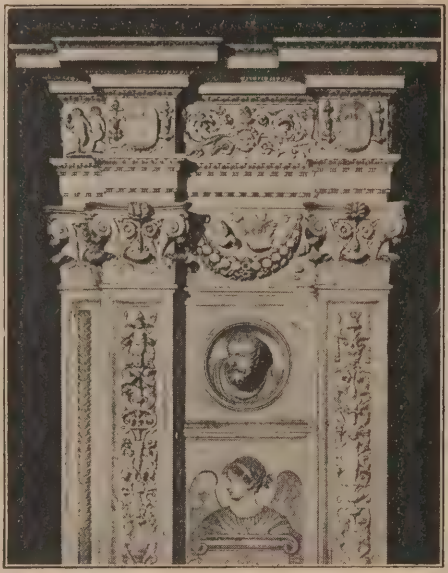
For instance, the delight which some of us may have in the Early Florentine work should not be allowed permanently to blind our eyes to the merits of the Early Venetian work, hampered as it was by Byzantine influences. If we, on the contrary, should be kindly disposed to this Byzantine feeling, let us not reject the other school which had no control of the circumstances which failed to equip it with similar material for inspiration.



MONUMENT TO CARDINAL BEMBO IN THE BASILICA OF S. ANTONIO, PADOVA. SANMICHELI, ARCHITECT.

We should, in fact, consider what favouring opportunities, or the reverse, an artist met with in the exercise and development of his art; and knowing them, we are in a better position to pronounce on the merits of his productions. Other thoughts as to the spirit in which such a study may most properly be made should doubtless suggest themselves readily enough to the student.

Let us look now at the outlines of the history of the Revival, and try to obtain some idea of the position in which Sanmicheli stood with regard to it. The beginning of the fifteenth century is generally understood to be the time which saw the birth of the Renaissance architecture of Italy, and to Florence is assigned the honour of being the cradle of the art. Filippo Brunelleschi may be said to have been the presiding genius of its infancy. It is interesting to note that the Revival sprang up in Florence, and not, as might have been expected, in Rome. Rome, however, at this time, owing to political disturbances, had fallen on evil days, and was even indebted to Florentine artists for the architectural productions of this period which it possessed.



DETAIL OF ALTAR, ORVIETO CATHEDRAL. SANMICHELI, ARCHITECT.

Here one may remark the confusion of ideas resulting from the use of the term "Roman" as applied to various matters that the student has to consider. For it may have reference either to the ancient classic art of Rome or to the art of the Renaissance as related to that city. Further, we may note that a Renaissance building of Rome does not necessarily show more traces of the ancient Roman influence than a building of the same period in one of the other great artistic centres. An instance of this might be shown in the facade of the Farnese palace at Rome, which has a feeling quite distinctly suggestive of the Florentine palace work of a century previous rather than of Rome's own ancient examples. Compare this with the Vecchian Library at Venice, which was erected nearly at the same time from the designs of Jacopo Sansovino the Florentine, and has a distinctly classic Roman character. One finds, naturally enough, some little difficulty in determining the influences which dominated the qualities to be observed in the works of the various architects of those times.

The Renaissance feeling, which first appeared in Florence, next showed itself in Milan about 1460, and in Venice about 1480. It was not until the beginning of the sixteenth century that the new influence made itself properly felt in Rome. Bramante, whose genius had been previously exercised in Milan and its adjacent territory, coming to Rome about this time, may be said to have been the pioneer of the new movement there.

Rome began early in the sixteenth century to reassert its position as a great centre of artistic activity, and here it was that the early Renaissance style, which may be said to have ended with Bramante, developed under the hands of his pupils and successors into what has been called the Culminating period. The influence of these followers of Bramante induced the spread of the classic forms of the late Renaissance all over Italy. It was to this Culminating period that Sanmicheli belonged. During this period a closer approach to classic Roman types was of course made, while the inspiration derived from the ancient examples was applied with greater boldness and facility than in the earlier work, and at the same time in a thoroughly sincere and intelligent manner.

It is surely not too much to claim for this work the place of first importance, inasmuch as the earlier work, however charming it may be, cannot be said to show the fullest development of the new ideas, while in that of the succeeding period (should we divide the Renaissance into three periods) we meet with the evidences of an inevitable decay.

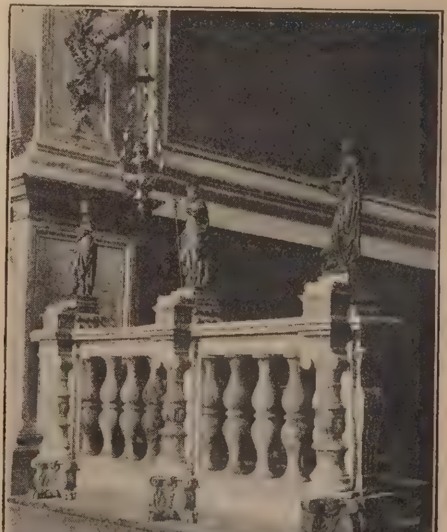
Sanmicheli's most important work was executed during this Culminating or central period, which may be said to be embraced, roughly speaking, in the first half of the sixteenth century; and though signs of the decadence of the art may be seen in buildings erected during our artist's lifetime, his work may fairly be said to be free from any trace of a downward tendency. In fact, the very essence of his art is an absolute negation of those same faults which in his contemporaries and successors led to the degeneration of what was noble and refined into the voluptuous and debased Barocco style.

Michele Sanmicheli was born at Verona, in the territory of the Venetian Republic, in the year 1484. His father was an architect, as was also his uncle, and from them he doubtless derived his first instruction in the rudiments of his profession. At the age of sixteen he went to Rome, and there commenced the study of the ancient architectural antiquities, measuring and examining everything with the greatest care and with a zeal which seems to have brought him into prominence not only in the capital but in the outlying territory also. It is worthy of note that it was just at this time that Bramante came to Rome, and that there had been up till then but little in the way of Renaissance buildings in the city. Sanmicheli would doubtless see springing up, in the course of the first few years of the new century, new buildings designed by Bramante, and of a more advanced type than he had been accustomed to. We may be sure that these new buildings, which included the Cancellaria and Giraud palaces, were carefully noted by our artist.

Sanmicheli's reputation as an industrious student of art seems to have procured for him the position of superintendent of works at the cathedral of Orvieto. For this building he designed the beautiful altar of the Magi, or Three Kings.

This piece of work has, as we might expect, a predominant early feeling about it, and some of its features suggest the early or Lombardesque manner of Bramante. The altar does not seem to have been completed at this time, as we read that Simone Mosca undertook the greater part of the sculpture work a good many years later.

In the same town Sanmicheli constructed underground in the church of San Domenico a sepulchral chapel for the Petrucci family, as well as some houses here and in the neighbouring town of Montefiascone. The cathedral of this latter town, a church octagonal in plan



DETAIL OF CHOIR, S. GIORGIO, VERONA. SANMICHELI, ARCHITECT.

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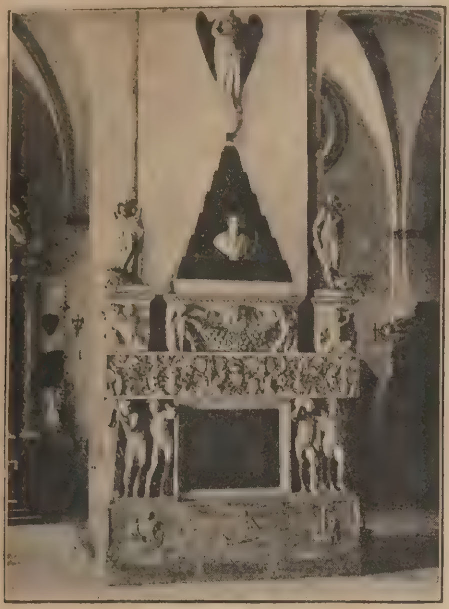
* A paper read before the Edinburgh Architectural Society on March 13th, 1901.



MONUMENT TO GENERAL ALESSANDRO CONTARINI, S. ANTONIO, PADOVA. SANMICHELI, ARCHITECT.

and having a cupola which is said to be of graceful and elegant design, is also attributed to him, though Sangallo the younger, who was certainly engaged in Montefiascone about that time, has also been credited with it.

The consideration of these works takes us to somewhere about the year 1523, which saw the commencement of the Pontificate of Clement VII. This pope soon found himself involved in the political disturbances which culminated in the sack of Rome in 1527. At the time of his election, the Emperor Charles V. and Francis I., King of France, were at war with one another in Lombardy; and Clement, apprehensive of the safety of his own territory, determined to strengthen the fortifications of the Ecclesiastical States. In particular, he wished to make secure Parma and Piacenza, two important towns in the north, close to the Lombardic frontier. Sanmicheli was appointed to assist Antonio da Sangallo the younger in the works just referred to, and by their labours the designs for the fortifications were brought to perfection.

This was the commencement of a long and eminent career as a military architect. For many years Sanmicheli must have directed his energies entirely to works of this class, and there can be little doubt that many of the characteristics of his style are the outcome of these years spent in the designing of structures in which utility was the consideration absolutely essential.

Sanmicheli probably completed his works in the north of the Papal States in the year 1526. Being at no great distance from Verona, he desired to visit his native town and to see once more his kindred and friends. Thither he went, and after a stay of a few days, formed a desire to examine some of the fortresses of the Venetian territory. Thus he made his way to Treviso, and after studying there he proceeded to Padua. The Venetians, who were at this time in league with Pope Clement VII. against the Emperor, being warned of this examination of their strongholds, and fearing that Sanmicheli might propose to use these observations to their injury, had him arrested and thrown into prison at Padua. Being assured however, on enquiry, as to his integrity, they immediately released him, and offered him a position in their service with the promise of a liberal allowance. Sanmicheli excused himself from accepting this offer on the ground of his being still in the service of the Pope, but he gave them fair promises, and was finally allowed to depart.

The Venetian Signori did not allow him to forget these promises, but seem to have brought all the influence in their power to bear on him, with a view to inducing him to abandon Rome and enter their service. Possibly they may have had some lingering doubts as to the object of his inspection of their fortresses. Sanmicheli, however, refused to stir until His Holiness accorded him full permission to depart, whereon he immediately set out for Venice and entered the services of the Signori within the territory of whose jurisdiction he had been born. This probably occurred either late in the year 1526 or early in the following year.

He immediately took in hand the works his masters had in view, and it was in Verona, his native place, that his abilities were first tested. Here, after overcoming many difficulties, he erected, to the great satisfaction of the Signori and their captain-general the Duke of Urbino, a splendid fort called "la Maddalene."

The erection of this structure may be said to denote an important development in the history of military architecture. Here it was that a new type of bastion was designed in which was realised a form which had hitherto been the aim of all mediæval military works. This aim was to provide a fortification which should give to the defences a strength and resisting power equal to the force of the attack up to the point where siege artillery acquired an irresistible superiority. The realisation of this is to be found in the angular bastion which Sanmicheli is credited with having originated.

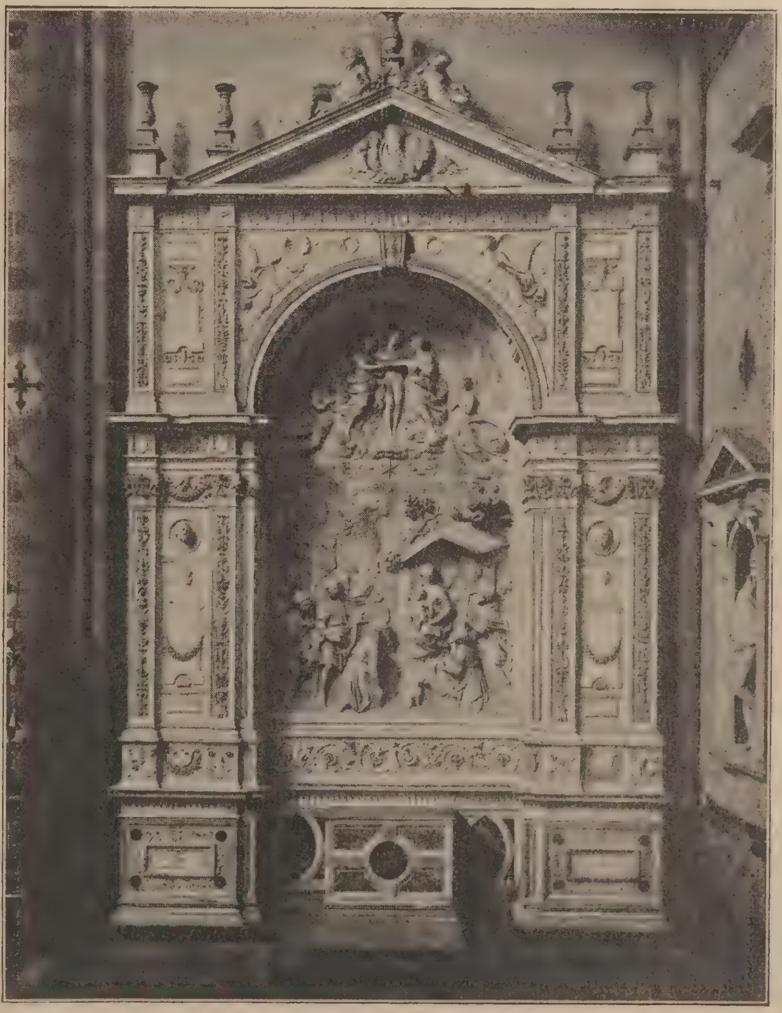
Viollet-le-duc, however, points out that France may reasonably contest Italy's claim to this distinction, inasmuch as there exists among the archives of Troyes a manuscript plan of fortifications for that town in which are clearly shown bastions whose faces form obtuse angles. This plan, Viollet-le-duc declares, cannot be of later date than 1530, at which time Francis I. had these fortifications repaired. It is quite possible that this form may have been evolved independently by different persons about the same time, as the military science of the day had been gradually advanced to a state of which this new departure was a natural outcome. These bastions were towers whose primary object was to defend the enclosing curtain wall of the fort, and they were attached to and projected from the wall at its salient angles and at certain intervals throughout its length. It was a maxim that "whatever defends should itself be defended." Thus these bastions relied to a great extent for their security on the readiness with which they themselves could be defended from points close at hand on the curtain wall. The early square towers and the circular ones in vogue later were deficient in this respect, for there was always a space in front of the tower which was not covered by the fire from the curtain on each side, and in this space the sapping or other work of destruction might under some conditions freely proceed. Later on a beak or horn was formed on the face of these round towers, by which means they were completely covered by the fire from the curtain wall, which would keep the enemy at a safer distance. The perfection of this idea is to be found in Sanmicheli's bastion, by means of which a perfectly complete system of defence works may be said to have been provided; for an assaulting column, whether it was thrown on a bastion or the curtain wall where a breach had been made, was always met by a cross-fire.

The faces of the bastions were defended not only by the fire from the curtain, but also by cross-fires from their own batteries; and so long as these batteries were in action any attempt to force a breach in the curtain adjoining was fully guarded against.

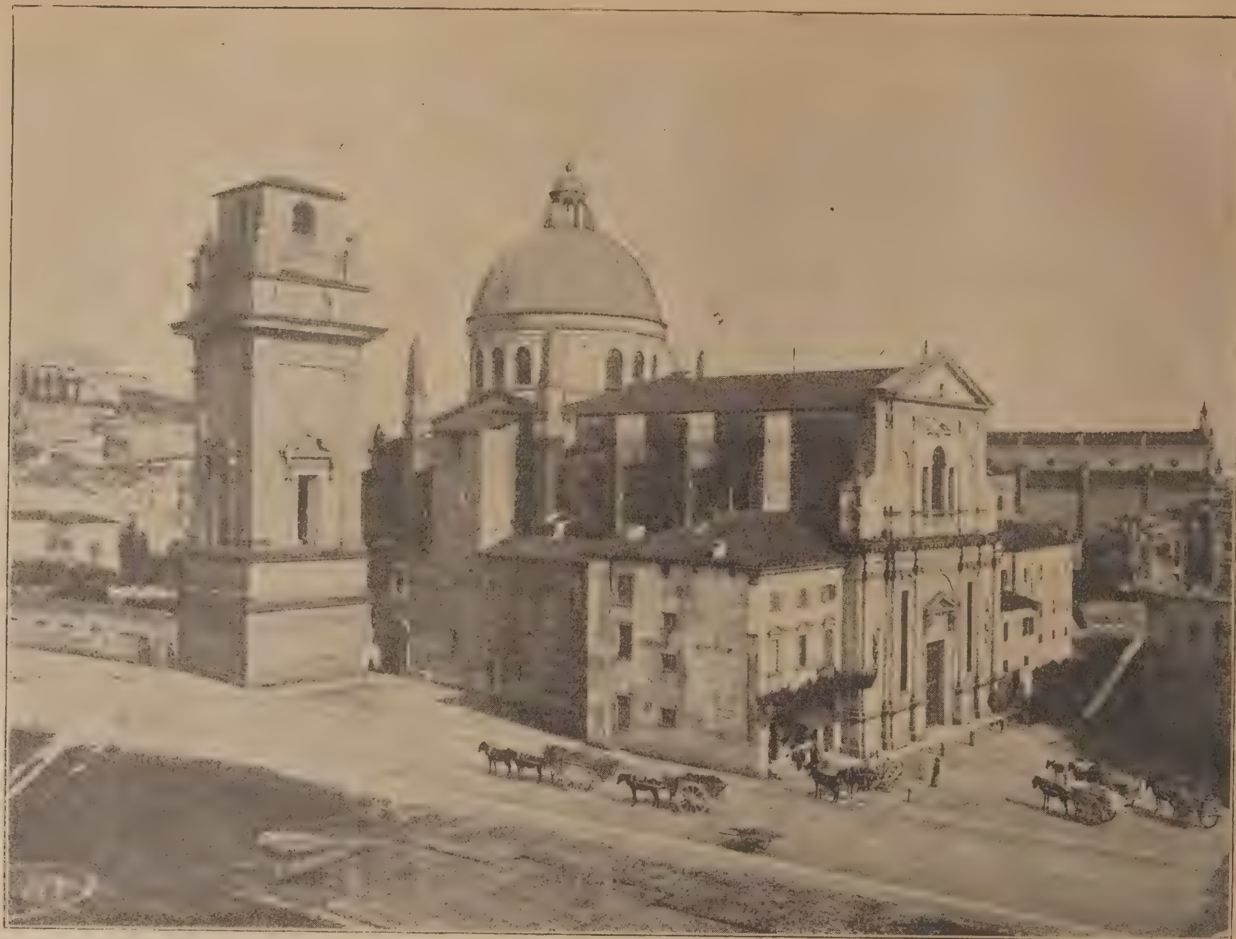
Further, should the bastion main batteries be silenced, a breach be effected in the curtain and an assault made there, the enemy were enfiladed by the fire from batteries held in reserve and masked from the fire of the siege batteries by the projecting rounded ends of the bastions, called orillons.

This, then, was the sort of work on which Sanmicheli was engaged almost exclusively for the best years of his life.

Fortunately, however, these fortification works, though primarily utilitarian, nevertheless afforded some opportunities for the display of artistic skill. These chiefly occurred in the fortified gates which gave access within the city walls. At Verona several gates were erected from his designs and these may be reckoned



THE ALTAR, ORVIETO CATHEDRAL. SANMICHELI, ARCHITECT.



S. GIORGIO, VERONA, SHOWING WORK BY SANMICHELI.

among the finest of his works. No praise, it seems to me, could be too high for the artistic skill shown in these productions. One is struck by the perfect fitness of the architectural treatment to the purpose which the structure was designed to serve. Here we have the two qualities which we should consider essential—simplicity and strength—expressed to perfection and with the utmost refinement.

The spirit of ancient Roman art seems to live again in them, and to justify the very foundation principle of the Renaissance. Few buildings of the period are clothed with forms which may be said to embody so entirely the letter of the old tradition, and yet here is given a manifestation of the most vigorous and healthy living art.

In the Porta del Palio a Doric order almost Greek in feeling is employed. The gateway is divided into three bays, with arched openings on the interior face, flanked by coupled attached columns, the whole face being rusticated. We note the immense keyblocks in which Sanmicheli delighted, and to which he gave a practical value in the actual support of the architrave. The entablature is beautifully detailed on regular classic lines. The columns have neither necking nor base, and the arches are denied an archivolt. The corners are finished with pilasters, not columns, and the horizontal rusticated courses are varied in depth. On the exterior front of the gate we have a richer treatment of a theme similar to the above. The order is employed with all its ornaments, and a flat arch is introduced under the architrave. The small side entrances are crowned with pediments carried on tresses.

In the Porta Nuova (illustrated on page 138 of the Builders' Journal for March 27th last) the same order is employed treated with the severest simplicity and with an effect that is most noble.

Sanmicheli also erected another gate in Verona, namely, that of San Zeno, and several bastions; much of this work is now destroyed. He also designed two fine gates at Legnano, and numerous other fortifications throughout the Venetian territories. So widespread, indeed, was his fame that he was begged to enter the service of the Emperor Charles V. and of Francis I., king of France, whose offers he was patriotic enough to refuse. The Duke of Milan was more fortunate in his endeavours to profit by the genius of Sanmicheli, as the obliging Republic his masters lent him for three months to their powerful neighbour. The late J. W. Anderson states this period at three years, but on what authority I know not.

So much was demanded of our architect that he had to depute a good deal of work, chiefly in the carrying out of designs, to his nephew, who seems to have been a very capable man. The only other work of this nature to which it is proposed to refer is the castle of Sant' Andrea del Lido at Venice. This was an undertaking of great difficulty, the site being, according to Vasari, a tongue of marshy land projecting into the sea. The Signori took good care to impress on Sanmicheli an idea of the importance of the work entrusted to him, and of the caution and care it would involve. He might well have undertaken the work in fear and trembling, knowing the despotic nature of the Signori, who seemed to favour that form of justice which consisted in hanging a man first and trying him afterwards. His contemporary Sansovino had a taste of their quality, being thrown into prison, degraded and fined 1,000 ducats because some stone vaulting in the library had fallen in during construction.

Sanmicheli, however, after tremendous effort succeeded in laying the foundations, which were below sea-level, and proceeded to erect a splendid fort. His difficulties were not over, however; for when the work was well forward, troublesome persons raised an agitation, alleging that the walls were not strong enough to sustain the weight of the artillery which the fort was to receive, much less the shock of its discharge. The architect immediately proposed that the fort should be armed with all the heaviest pieces of ordnance available, and that they should all be discharged at once. This was forthwith done, and the perfect solidity of the building was clearly revealed. Vasari quaintly remarks that such was the commotion raised by this incident, that certain noble ladies were removed from the city lest any catastrophe should have an ill effect on the delicate condition in which they happened to be at the time.

Now such a devotion to works of an essentially utilitarian character could hardly fail to have a marked effect on his designs for work where a more or less ornamental treatment was required. This view is, indeed, fully justified by the character of his civil and ecclesiastical works. The most notable example of this is the Palazzo Pompei at Verona, a work of great simplicity of treatment and most beautiful effect. The lower storey is rusticated, mouldings are to a great extent dispensed with, and a severe Doric order, almost Greek in feeling, is employed in the first storey. The broad archivolts of the upper windows, the huge keyblocks, and the raising of the columns on a double base may be noticed as characteristic of this architect's work. It should also be noticed that in this and his other buildings he simply recesses the joints of his rustications, and not the courses.

Besides the Pompei, he built many other palaces in Verona, including the Bevilacqua, Canossa, Guastaverzi, and others not readily identified (see Builders' Journal for February 6th last). Of these the most important is the Bevilacqua Palace, a building of some richness, in which we find again a rusticated lower stage. The Doric pilasters of this storey and the Corinthian columns above are grouped in pairs, which, with the windows they enclose, form main features of support, between which are large arched windows. Characteristic points may be noted in the keyblocks, the spiral flutings of the columns, and the double pedestals on which these are raised. A somewhat similar grouping of pilasters, and a window not unlike the small first-floor windows, may be seen in Bramante's Cancellaria Palace at Rome. An example of antique Roman columns fluted spirally is to be seen among the ancient ruins in Verona.

He designed in Venice the Grimani, Mocenigo, and Bragadini palaces, as well as some in other districts which are now lost to us. The Grimani Palace (see Builders' Journal for February 6th last) has been called Sanmicheli's masterpiece, though there are some defects in its proportions. Ruskin, who had little good to say of the Renaissance, spoke in glowing terms of it. It has some resemblance to the earlier Vendramini Palace, a work by Lombardi, who also came under Bramante's influence.

The Grimani Palace lacks the traces of the Gothic tradition noticeable in the earlier Venetian palaces, these being replaced by a strong Roman feeling. The arcaded bays in the upper storeys seem to have a suggestion of the Colisseum in their stunted proportions as well as their general composition. The unpleasing proportion of the upper storeys is the weak point in this design, the ground stage being perfect in itself. Sanmicheli's simplifying spirit finds expression in the use of one order throughout the facade.

We are told that the building had not proceeded very far at the time of the architect's death, and that his successors departed from the original details considerably.

The Palazzo Gran Guardia at Verona has been attributed to Sanmicheli, and also, with more show of reason, to a nephew who was evidently also a disciple.

With regard to ecclesiastical work Sanmicheli was singularly unfortunate. Notwithstanding the many designs he made for buildings of this class, there is hardly one that may be said to have been carried out in its entirety by him. The death of clients, scarcity of funds, stupidity of committees, and finally the death of the master himself, are responsible for this. The Pellegrini chapel, in the church of San Bernardino at Verona, is the most important work of this nature he has left us, and even this was not completed during the artist's lifetime. It is circular in plan, in the Corinthian Order, and shows detail of great refinement and grace. His works at Orvieto and its vicinity have already been referred to. Mention may be made of his works at Santa Maria in Organo, and San Giorgio, Verona, both incomplete.

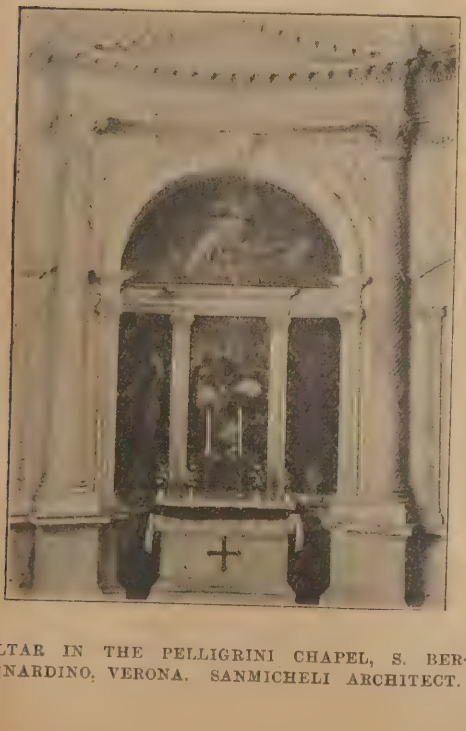
He designed, in addition, many other works of this class, which need not be referred to here.

Two interesting monuments which he erected are those at Padua to General Contarini and Cardinal Bembo. These are designed in a manner quite distinct from the well-known Renaissance type, which Sanmicheli is said to have considered more suited to an altar than a tomb, and to have objected to on that account.

There exists in Verona, and possibly also in other Italian towns, small works, such as doorways, attributed to him, which might be sought out and catalogued did a suitable opportunity for doing so occur.

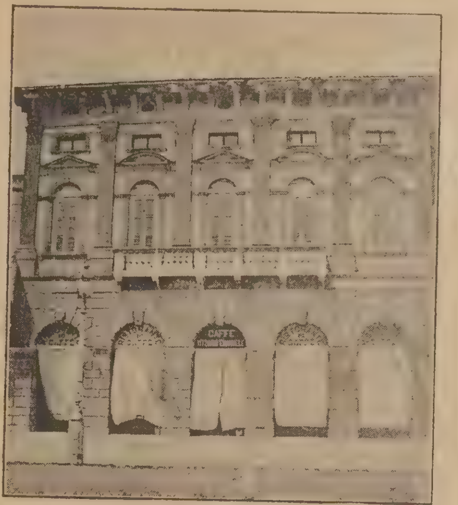
A few words may be said as to the chief artistic qualities which Sanmicheli shows in his architectural designs. First and foremost are his great power of restraint, somewhat unusual in the artists of his time, and his love of simplicity. This power of restraint was, of course, inherent and natural; and his simplicity, though partly co-existent with it, was doubtless also the outcome of the particular circumstances under which his art was practised.

His devotion to works of military architecture, from which the idea of simplicity and boldness of treatment could hardly be separated, doubtless fostered this tendency of his. Another factor which may have led to his adoption of a simple treatment for his Veronese facades was the custom which held there and in other Italian towns of adorning them with painted decoration.


ALTAR IN THE PELLIGRINI CHAPEL, S. BERNARDINO, VERONA. SANMICHELI ARCHITECT.

In his ornate buildings we see his restraint very clearly, as well as in his severe ones. Compare his Grimani Palace, say, with Sansovino's Library at Venice, and one finds in the former a sense of repose which is somewhat lacking in the latter.

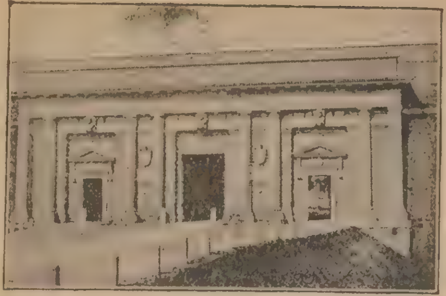
Sanmicheli seemed to have the faculty of giving to his subordinate features just the right amount of emphasis, keeping them in fact truly subordinate. A faculty closely linked to the above was his refinement. Even in his boldest semi-military work there is not a trace of coarseness. These are, in fact, but phases of his exquisite sense of proportion. He was possessed of great fertility of design and originality of treatment. Although he adhered closely to the elements of the ancient classic style, and probably received suggestions from the work of contemporaries, he developed them in a way peculiarly his own, and his compositions are varied, free from any taint of sameness and usually delightfully fresh. His Contarini tomb, highly satisfactory as it is from an architectural point of view, might well satisfy the cravings of the most earnest searcher for the original in art.


PALAZZO VERZI (GUASTAVERZI). SANMICHELI, ARCHITECT.

He gave great consideration in his designs to the connection which should exist between architectural features and the practical quality which they might be said to express. Thus his columns and pilasters are features of support, and not merely casual ornaments. The corners of his columnar facades he strengthened and finished with a square pilaster in a straightforward fashion, and they are always satisfactory. There is no quibbling with meaningless pillars, as in some of Sansovino's corners. His keyblocks, as their form suggests, were made actually to support the architrave which was jointed over them. We find him raising his columns on a double base, or even on a double pedestal, where he seemed to think the orthodoxy of a single base fatal to a proper expression of that feature.

A few words may suffice to tell of his personal characteristics, which were indeed in perfect harmony with the refined artistic qualities of the man. Judged in the light of the contemporary standard of morality, he seems to have been well-nigh perfect. Vasari says he was a man of most orderly and upright life, highly honourable in all his actions. He was a man of most devout and religious habits, and most careful to perform his daily religious exercises before attempting to start work of a morning.

A contrast to this sober regularity may be found in Michelangelo, who threw himself on his bed at nights dressed just as he was in his working garb, and after a few hours rest would rise impatient to be at his beloved work. So careless is Michelangelo said to have been that parts of his clothing were sometimes unremoved for weeks at a time, with the result that when that necessary operation was performed his skin suffered considerably in the process.


PORTA STUPPA, VERONA, SANMICHELI, ARCHITECT.

Sanmicheli was generous almost to a fault. If we may believe Vasari, he was the most kindly and friendly man that ever lived, insomuch that he was hardly aware of the wants or desires of his friends before he would instantly set about labouring to fulfil the same, though it were to the spending of his life. We are told that the Venetian Signori many times desired to increase his stipend, but that he always declined these addditions, desiring that these sums should be given to his nephews, who assisted him in his work. Vasari gives many instances of Sanmicheli's liberality and courtesy, which show well in the light of the character of such a man as Torrigiani the sculptor, who, it is said, used to boast that he had broken Michelangelo's nose in a fit of anger. This sculptor, however, carried his passion for breakage a little too far; for in later years, having a dispute with a Spanish grandee about the price of a Madonna he had carved, he dashed the sculpture in pieces. For this sacrilege Torrigiani was promptly thrown by the Inquisition into prison, where he starved himself to death.

Sanmicheli was, in fact, highly esteemed by many of the great men of his day, by artists and nobles alike. Michelangelo, in particular, is said to have had the greatest regard for him. He died in Verona in 1659, at a good old age, and was buried in the church of San Tommaso.

His work, without doubt, had a good influence on the art of his contemporaries; and to successive ages of architects it has stood as an example well worthy of study, and a safe guide to those who desire to express their art with dignity, sincerity and refinement.

AREA LIGHTS.

PROPOSED RESTRICTION AT SHEFFIELD.

THE secretary's report read at the recent annual meeting of the Sheffield Society of Architects (see page 199 of last week's issue) referred to the question of area lights. A letter had been sent to the Town Clerk in regard to the proposed action of the Plans Sub-Committee of the Highways Committee to restrict the construction of area lights in footpaths. The letter pointed out that up to the present the Society had no intimation that area lights were objected to by the Corporation, and they were unable to ascertain that any resolution had been passed by the Highways Committee of the City Council in regard to this matter. They considered that some formal intimation should have been given to the architects of Sheffield before the Corporation changed their policy. The proposed prohibition of area lights was a serious matter, affecting the value of property, both to owners and ratepayers of the city. The prevention of area lights would depreciate the value of building site already acquired on the supposition that such light would be allowed, as previously had been the case, and it would considerably reduce the ratable value of the property. Area lights of the maximum projection, if properly constructed, constituted no danger or inconvenience to the public, and most of the important towns allowed them to be constructed under proper regulations. This had been considered by the Highways Committee, and referred to the Works Sub-Committee, upon whom a deputation from the Society had attended. The sub-committee had delegated the chairman, vice-chairman and City Surveyor to meet the deputation at a future date and discuss the matter in detail.

THE QUEEN VICTORIA MEMORIAL.

SOME FURTHER OPINIONS.

We published last week a synopsis of the opinions of leading architects, sculptors and designers on the National Memorial to Queen Victoria to be erected in front of Buckingham Palace. Since then some further opinions have been expressed in the daily press.

Mr. Walter Crane

Mr. Walter Crane writes to the "Daily Chronicle" supporting the contention that the memorial should be the subject of an open competition among the artists of the country. In his opinion the general scheme should be sufficiently comprehensive to need the co-operation of many artists, including architectural and decorative design, as well as portrait and allegorical sculpture, and the work of many cunning craftsmen.

He says: "In the realisation of such a monument in the present condition of public taste, it seems to me there are too main pitfalls. On the one hand, there is the danger of sinking into tameness, and on the other of breaking out into extravagance and vulgarity.

"Such a thing might be made as official and characterless as our postage stamps, or some of our coinage; or as flamboyant as the latest steel-framed street frontage playfully concealed in terra-cotta, and, perhaps, 'surmounted by something Japanese.'

"It seems to me, too, that a mere naval and military trophy, however imposing, would be inappropriate. It is rather in the arts of peace that we have the most honourable record during the last sixty years, and it is by our progress in these that we shall be remembered in the future."

And His Suggestions.

Mr. Crane suggests that, in the open competition, "a certain number of prizes might be offered, so that meritorious designs not winning the first place might still have some substantial recognition and the designers some reward for their labours. A public free exhibition should be held of all the designs sent in, and the public invited to record their vote, by ballot, of the one preferred. Models to scale should be sent in by every competing artist of his design, and the models should be all to a given scale.

"Another way of obtaining a fairly extensive national opinion on the subject would be for each leading newspaper to invite its readers to send in the names of, say, five or six artists (to include architects, sculptors, and decorative designers) whom they would prefer to be invited to design the memorial. Then those artists whose names had the majority of votes should be invited to form a committee or council to draw up a scheme for the memorial and assign the execution of its different parts, which should be distributed as widely as possible, so far as might be consistent with excellence of design and workmanship."

Mr. Philip H. Newman's Walhalla.

Mr. Philip H. Newman, the honorary secretary and treasurer of the Society for the Encouragement of the Fine Arts, also writes to the "Chronicle" on the subject. He thinks that a building in the nature and scope of a Walhalla might be erected on the site of the transept of the Exhibition of 1851. In his opinion it might be even preferable to any other scheme, not only because of the possibility of including in some part of the plan the present Albert Memorial, but because "a building would afford that shelter to the groups and statues adorning it which our climate and London's atmosphere peremptorily demands."

What the Committee had in View.

Among the schemes considered by the Executive Committee was the revived one for extending Westminster Abbey as a national Walhalla, by adding a new chapel to it. Another was the erection of a building which should be of such design internally and externally as to typify Queen Victoria's reign. It was urged in objection to the latter scheme that the building would have to be in one of the parks, and so out of the way. Accordingly, in the end, the proposal for making the Mall into what may be called a "triumphal avenue" was adopted.

The view of those charged to decide the matter was that the Mall memorial would be more a question of sculpture than of architecture. It was necessary that a bird's-eye plan, so to speak, of the whole scheme should be made by an architect, but after that it would be the sculptor chiefly who would be called upon. It was decided to ask Mr. Brock to design the chief group of sculpture, that to be set up near Buckingham Palace. This was to be a beginning, for it was clearly understood that our other leading sculptors would be asked later, as funds justified progress, to contribute sculptures for the adornment of the Mall.

That point is important as removing a misunderstanding. The argument based upon it is that the memorial will really be open to the work of all our best sculptors. As to the task of the architects, the contention is, as has been stated, that it is subsidiary to the other.

These observations may be taken as indicating, more or less, the view of those charged with the organisation of the Memorial.

Mr. Caröe objects to the Mall Scheme.

Mr. W. D. Caröe said to a "Chronicle" representative: "I don't like the Mall scheme at all. I don't think it will work out well. At one end of the Mall you have Buckingham Palace, which can hardly be called a thing of beauty. At the other end you have the new Admiralty buildings, which are not beautiful either. Then, I think, it's a pity to interfere with the Mall, which has many historial associations, more especially as better schemes are possible. My own favourite one, perhaps, is the extension of Westminster Abbey, but various excellent schemes might be suggested." With regard to the question of a limited or open competition, he thinks that the greater the available talent the better.

Mr. Wimperis's Censure.

Mr. Edmund Wimperis, the well-known architect, holds strong views on the subject. Speaking of the Committee's action to a "Chronicle" representative, he said: "They say the best men will not send in competitive designs. Can they prove this? I have the very best reasons for knowing that it is not so, and that if there were a competition every one would send in designs. In my opinion the committee have gone on the wrong tack altogether. They begin by asking for a statue of Queen Victoria, and making that the central point of the whole memorial. And then they go on and ask the architects to provide the statue with some sort of a resting-place. What they might have done was to have asked for designs for the memorial as a whole."

Nothing New under the Sun.

A curious fact is made known by Mr. T. May. He finds that the suggested avenue from Buckingham Palace through the park, with an outlet by way of a memorial arch, is exactly paralleled in an engraving published on May 12th, 1794, by Lawrie & Whittle, of 53, Fleet Street, illustrating the Grand Walk in Vauxhall Gardens, with triumphal arches and statues of Mr. Handel and other famous musicians. Solomon was always wise in his sayings.

Mr. Adams Acton wants a Statue 200ft. High.

We learn that Mr. Adams Acton, the sculptor, recently submitted to the King a scheme which he has for the Victoria Memorial. By the King, who no doubt has been made the recipient of many suggestions, it was passed on to Lord Esher, the secretary of the Victoria Memorial.

Mr. Adams Acton designed the model for a statue 200ft. high. The design shows the Queen in her coronation robes. The sculptor would make the interior space of the monument, furnished by a colossal pedestal, a treasure-house for memorials of Queen Victoria's reign and a Walhalla for our illustrious dead. From the topmost jewel of the Queen's crown a great light would radiate at night, and lesser lights from the other jewels.

Mr. Adams Acton adds that if the scheme were carried out in its entirety it would give employment to all our leading sculptors and architects. Engineers would also be needed in the construction of the monument.

Mr. Lennox Browne makes the suggestion in the "Daily Graphic" that the Palace might have another storey added to it, a central cupola erected, the stucco removed from the front and replaced by red brick and stone, and a great curved screen with arches of varying heights substituted for the existing railings. Outside this screen, and facing the Palace, would be the statue of the late Queen on a high pedestal.

A special meeting of the Royal Institute of British Architects is to be held shortly to discuss the whole matter of this memorial.

THE BRIDGES OF CARDIFF.

An article on "Bogey Bridges of South Wales," by Mr. Edwin Seward, F.R.I.B.A., recently appeared in the columns of the "Western Mail." In Queen Street, Cardiff, the Taff Vale Railway Company some years ago cleared away a heavy, grimy, and undesirable structure of stone, replacing it by a girder bridge of a character "which, though not, perhaps, fulfilling all æsthetic requirements, goes a good way towards being an example of how iron girder bridges can be shaped and brightened up. The adjoining Rhymney Railway bridge has always been among the more graceful pieces of engineering design in the locality. Elsewhere in the town, however, another aspect of things prevails. The bridge carrying the Great Western Railway over Bute Street remains an utter disfigurement, with its uncompromising iron plates and girders. Another unsightly structure is the gloomy, tunnel-like bridge under the Great Western Railway in Penarth Road.

"In the matter of river bridges Cardiff is more fortunate. The widening of Cardiff Bridge itself (always regarding it as a modern engineering addition to an old masonry structure) is more broadly and attractively dealt with than is often the case. Cardiff is again fortunate also in having an engineering work of great technical importance and almost unique design in the Clarence Bridge over the Taff.

"Burges's little galleried bridge of Swiss character in the grounds of Cardiff Castle is most worthy of mention.

"On this subject of local bridges, considering the coming development of Cathays Park, it looks as if the long-expected highway from a point in Cathedral Road across the Taff and canal towards Cathays would afford an excellent opportunity for good designing. Perhaps a Victoria memorial may be asked for in connection with Cardiff, and, with the Clarence Bridge crossing the southernmost passage of the Taff, a Victoria Bridge connecting the northern districts above referred to would be a suitable and useful and (as it should be) a beautiful memorial to her late Majesty."

NOTES ON AN ARCHITECTURAL TOUR IN BELGIUM.

This was the title of a paper by Mr. James A. Arnot read before the Edinburgh Architectural Society recently. Belgium, although a small country, said Mr. Arnot, was exceedingly rich in architectural monuments. Its historical record is no less interesting. It attained the height of its prosperity during the Middle Ages, but declined under the tyranny of the Spanish rule during the fifteenth century. The country was not famous for its ecclesiastical architecture so much as for its splendid array of buildings devoted to secular purposes. Evidences of this wealth of the country were to be seen in the town halls of Brussels, Bruges, Ghent, &c., which were most richly adorned with sculpture and detail. Among the trade and guild halls were also to be found buildings of no mean importance. The most notable of this class were the cloth hall at Ypres and the halls at Bruges. Among the guildry houses at Brussels and Antwerp were also seen traces of the wealth of the country.

In domestic buildings the people displayed the same care that they gave to more important edifices, and in this class were found many interesting facades richly adorned with brick tracery and cusping. Among buildings of the present day the most important was the Palais de Justice, Brussels, which ranked amongst the world's wonders. At the present time there was in Belgium a tendency to adopt the style which has become known as "L'art Nouveau," and whatever the merits or demerits of this break away from the beaten track, it was a subject well worth studying, as it was undoubtedly the outcome of very considerable thought.

UNION BANK BUILDINGS, ABERDEEN.

CONSIDERABLE improvements have been completed to the Union Bank Buildings in Castle Street, Aberdeen. By the reconstruction now carried out there is both an outer and an inner door to the telling-office, so that all draughts are avoided. The architectural features of the outer doorway are pilasters and architrave. An entirely new polished mahogany doorway and porch have been provided, the larger outer door sliding back into a pocket. The inside double swing doors have bevelled plate glass panels in the upper portion. Inside the office a new mahogany counter has been provided, with circled glass framing for the teller's boxes, and space provided for four instead of three tellers as formerly. The floor of the office has been laid with mosaic tiling of a unique pattern, the bank's coat of arms—a combination of the arms of Edinburgh and Glasgow—being wrought out in the centre. The whole office has been re-painted and re-decorated by Messrs. A. Ferguson & Co., Aberdeen, whose design was selected in competition from those submitted by the leading painters in the city. The present building was erected in 1800, for the Aberdeen Banking Company, from plans by Mr. James Burn. Electric light, electric bells, and telephones have been introduced. A patent collapsible iron gate, furnished by the Bostwick Gate and Shutter Company, London, shuts off the bank offices proper from the access to the dwelling-house. The grill in the arch over the entrance door is composed of Scotch thistles wrought in hammered iron, with the name of the bank intertwined, and was executed by Messrs. Jones & Willis, Birmingham. The outside iron gate of the doorway was provided by Messrs. David M'Hardy & Son, Netherkirkgate, Aberdeen; the woodwork by Messrs. M'Robbie & Milne, Aberdeen; the masonwork by Messrs. Gall & Walker, Aberdeen; the electric lights by Messrs. Pratt & Keith, Aberdeen; and the tiling by Messrs. Carter & Co., Poole. The counter brackets between the tellers' boxes were constructed by Messrs. John Blaikie & Son, Aberdeen. The architect for the work was Mr. A. C. Bruce, of Messrs. William Henderson & Son, Union Street, Aberdeen.

PALAZZO GRAN GUARDIA, VERONA; IN THE STYLE OF SANMICHELI.

PRESTON ROYAL INFIRMARY.

A SCHEME of alterations and additions to the Preston and County of Lancaster Royal Infirmary, including the erection of a new operating theatre and the addition of a new wing to be used as a nurses' home, is being carried out. The new operating theatre has already been completed, and is now in use. With the furnishings, it cost £2,654. It consists of a room for the reception of patients, anæsthetising room, operating theatre (lighted from the roof and sides), doctors' consulting room, lavatory, &c. With a view to guarding against the lodgment of dust and a harbourage for microbes these rooms have been laid with tiled floors on concrete, the walls and ceilings tiled throughout, and all corners rounded off. The operating theatre has a semi-circular end. The semi-circular ceiling is surmounted by a second roof to admit of an equable temperature at all times of the year, while large windows of polished plate glass, obscured on one side, give a bright and even light. The natural system of ventilation—heating by radiators specially constructed for easy cleaning—has been introduced here. A special feature has been made of the drainage, the waste pipes being disconnected from the drains, and the sinks and other surgical apparatus being of the best quality. The theatre is electrically lighted by brackets from the sides, and there are five movable lights round the operating table.

The new Diamond Jubilee wing, which joins up to the present administrative block, is intended as a nurses' home. It consists of 43 bedrooms, bathroom, large nurses' day room, large nurses' dining-room, linen rooms, sitting and dining rooms for head nurses, probationers' and other accommodation.

Alterations have been effected in the children's ward, the covered way, the typhoid block, and the main wards. In the children's ward there is a new bathroom, and the wards, corridor, kitchen, bathroom, and other offices have been been laid with terrazzo flooring, and the walls have been tiled, while the whole building has been painted and redecorated. The latest sanitary fittings have been introduced, and the drainage has been rearranged, while the system of heating has been improved. All skirting, cornices, and all square internal angles have been removed and made concave, to allow of easy cleansing. In the typhoid block renovations and improvements similar to those in the children's ward have been made, and this also applies to the alterations now proceeding in the main wards. The ventilation, which is on the natural system, has been carefully considered, and special arrangements are being made for the summer, when the movement of air is sluggish. Electric light will be introduced. The heating arrangements are also being remodelled, while the entire system of drainage is being rearranged, as the old system was considered far too defective for a building of this nature.

Further additions, are in contemplation. Plans have been prepared for a new out-patients' department at the side opposite the new nurses' home, and when completed this proposed new wing will balance the one already in progress, the entire block then taking the form of a cross. In this proposed wing there will be provision for a large central waiting room, with consulting rooms, surgery, and dispensary, and an ambulance porch. Alterations to the administrative block which will give improved conditions and increased facilities are also proposed, and several other necessary changes in the lesser departments are also to be introduced. All of this work of alteration and addition has been carried out from plans prepared by Mr. F. E. Dixon, A.M.I.C.E.

SCENIC ART.

The Architecture of "Coriolanus" and "The True Principles of Stage Scenery."

A VERY interesting interview with Sir Laurence Alma-Tadema with regard to the architectural scenery in Sir Henry Irving's "Coriolanus" at the Lyceum Theatre was published last week in the "Daily News." Sir Laurence, it may be mentioned, has a very fine collection of architectural photographs of buildings in all parts of the world.

"Coriolanus," he said, "presented difficulties far beyond the other plays for which I have designed the backgrounds. In the first place, our accurate knowledge of such a distant time is necessary very limited. In the second place, what we do know places serious obstacles in the way of presenting that dramatic contrast which is so essential in the theatre. For the information which the discovery of the monument beneath the Lapis Nigra afforded proves almost conclusively what, indeed, was known before, that the early Roman civilisation was mainly Etruscan.

"But it was necessary in this play to mark a contrast between the inhabitants and the buildings of Rome and Corioli, and to make the Rome of Marcus more distinctively Roman, and I was obliged to avail myself of a little artistic or poetic licence. In the Volscian scenes I have made some attempt—necessarily founded largely on conjecture—to reconstruct the known characteristics of Etruscan architecture. In the Roman scenes, while partly preserving the same character, I have allowed myself a little latitude in bringing the date of the play in architecture a little nearer to a period which can be recognised as definitely Roman, while I have sometimes assumed that the earliest forms in furniture and other accessories were not so far different in earliest Rome than in earliest Greece—as who shall clearly differentiate the forms of common things in the beginning of the two civilisations?"

Sir Laurence's water-colour originals for the interior of Caius Marcius's house, and the beautiful exterior of Aufidius's house in the moonlight, are to be exhibited at the Water-Colour Society's gallery this year.

Mr. PERCY FITZGERALD'S PAPER.

Mr. Percy Fitzgerald read a paper on "The True Principles of Stage Scenery" before the Society of Arts last week.

Formerly, he said, it was the drama, with the display of character and emotions, that constituted the attraction on the stage. Now panoramic and spectacular joys were provided, and there were fair grounds for the general opinion that in this direction we had all but reached a sort of perfection.

But this extraordinary circumstance had to be noted—the whole of our scenic system seemed based on a number of primitive shifts and devices, clumsy to a degree. Trees were supported by means appropriate to music stands; rocks were boxes with painted linen tacked on; the sky was represented by strips of linen suspended from sticks, like clothes hung out to dry; landscapes fluttered about foolishly; and from the stalls you could see great disillusioning gaps.

He did not know what was gained by the modern built-up scenery. No dramatic advantage was secured by making people ascend or descend flights of steps, or cross bridges, or enter the porch of a church, as all those operations could be described or suggested. "It may seem paradoxical to say so," continuted Mr. Fitzgerald, "but it seems that the greatest so-called improvement of modern days, namely, the brilliant lighting of the stage, has done much to destroy all scenic illusions." Many would recall the beautiful scene-painting of Tolbin, Stanfield. Grieve, and Danby, and of Mr. Craven in his earlier days. Formerly scene-painters became R.A.'s—a thing nowadays inconceivable.

The scene-painters of those days were able to produce such finished work because the light on the stage was low and did not kill their colours. At the present time all half-tone yellows and other delicate tints disappeared, and the painters had to paint to suit the conflagration. In Garrick's days there were simply four large chandeliers, which furnished a zone of light within which the actors kept, the rest of the stage being misty, and the surrounding scenery much like the indistinct details of the tapestry.

We were not working on the right lines—we were engaged in thoroughly disillusioning audiences. Scenery, he argued, should be more or less abstract, for "if the interest excited by the dramatic situation be sufficiently strong and overpowering, we shall not note how the players are dressed, or how magnificent the scene and its appointments are."

Correspondence.

Computing Land Areas.

To the Editor of THE BUILDERS' JOURNAL.

LONDON.

SIR,—I read with interest the article in your issue of April 10th on the above subject, and should like to make one or two remarks respecting the concluding paragraph.

Alluding to the computation of areas contained within irregular boundaries, the writer observes that "no method of computing curved outlines can be considered as absolutely correct," from which remark I am led to conclude that the writer of the article is not familiar with the great advantages to be derived from the use of Amsler's planimeter for this purpose; since, by the use of that instrument the difficulty alluded to is entirely obviated. Sir Frederick Bramwell, in a communication to the British Association (printed *in extenso* in the Association's Report for 1872), pointed out that the area of any figure, *however irregular*, can, by means of Amsler's planimeter, be measured with "absolute accuracy" by merely running the tracing point of the instrument round the perimeter of the figure to be measured; and stated that "it gives to the surveyor the readiest means of calculating the acreage of whole estates or of separate fields."

Of the various methods for computing land areas from maps and plans, that in which the planimeter is used is, I feel confident, by far the simplest and most accurate; and were this fact more generally known other methods would be discarded in its favour. The planimeter records the number of *square inches of map surface* contained by the plot under measurement, and if this and the scale of the map be known, it is clear that the acreage of the plot can be calculated. To do away with the necessity for these calculations, I drew up, a few years ago, some tables, showing—for any scale—the area in acres, roods and perches represented by any number of square inches of map surface, which thus form a "Ready Reckoner," from which the acreage can at once be taken. Having been requested to make these tables available for public use, I lately submitted them to the well-known firm of E. & F. N. Spon, Ltd., who published them.

I should like to add that I do not think it is overstating the case to say that the combined use of the planimeter and these land area tables reduces the labour involved in the computation of areas to a minimum, as no previous knowledge or practice is required, and the work can be performed by the most unskilled person. —Yours truly, WILLIAM CODD.

Little and Great Stanmore Churches.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, N.W.

SIR,—May I venture to correct an error made by "G. A. T. M." in his reply, on page 203 of your last issue, respecting Little Stanmore Church. The church described in the answer is that of Little Stanmore *alias* Whitchurch. The ruined brick church to which the query refers is that of the adjoining parish of Great Stanmore.

The original church at Great Stanmore stood on a site about a quarter of a mile to the south of the ruined brick church. Its position was denoted by a tomb to the memory of Baptist Willoughby, who was for fifty years incumbent of the parish, and died in 1610.

In 1632 a new church was built on a site given by Mrs. Barbara Burnell, Sir Thomas Lake and a Mr. Robinson. The building was erected at the expense of Sir John Wolstenholme It was consecrated by Bishop Land (afterwards Archbishop), and dedicated to Sir John the Evangelist. The building consisted of a nave and chancel, with an embattled tower at the west end. The porch, which apparently stood on the south side, was designed by Nicholas Stone. The arms of the Wolstenholme family were introduced into the glazing of the east window.

In 1720 six bells from Little Stanmore church were bought by the parishoners, and were hung in the tower. The church contained memorials to the Drummond, Wolstenholme, Burnell and Beauclerk families, and a vault belonging to the Marquis of Abercorn. The vault referred to in the query is probably the mausoleum of the Holland family, formerly of Stanmore Hall.

The present church, which stands to the east of the second church, was built about 1849. Mr. Henry Clutton was the architect. It contains several monuments, which were removed from the previous building; among them being that to Sir John Wolstenholme, which was designed by Nicholas Stone, and cost £200. Another monument to John Burnell, his wife and family curiously represents three children who predeceased their parents, holding skulls in their hands. The parish register dates from 1599.

"Twopence a Week" will find references in Lyson's "Environs of London" (1810), a copy of which at the Guildhall Library is extended from the original four volumes to thirteen volumes by the insertion of engravings. Hughson's "London," published also in 1810, and Cassell's "Greater London" also contain notices of the church.—Yours truly. B. C. DEXTER.

Builders' Notes.

Building Operations at Cambuslang.—To cope with an ever-increasing demand for shops and houses, especially of two and three room apartments, building operations have been exceedingly brisk in Cambuslang for the past few months. The large blocks of tenements at Pretoria Street and Park Street are rapidly nearing completion. A line of shops is to be commenced at Tavern Square. Brownside Road and Greenlees Road have lately been lined by many self-contained cottages.

A Private Chapel in the new Archiepiscopal Palace at Canterbury was consecrated last week. The chapel has been erected, from designs by Mr. W. D. Caröe, architect to the Ecclesiastical Commissioners, by Messrs. John Barker & Co., of London, contractors for the alterations and additions to the palace. There are two rows of stalls on each side of the chapel, which, like the panelled roof, are carved in fumigated oak, and on the ends of the stalls are figures of the archbishops from St. Augustine to Dr. Benson.

Mr. Henry William Bull, head of the firm of Bull & Sons, builders of the Law Courts, the Parliament Houses at Cape Town, and other large structures, died at Southampton last week. It was during the work at the Law Courts that the famous masons' strike occurred. Mr. Bull went to Germany and engaged a large number of German masons, whom he brought to England, and they were housed on the site of the Courts under Government protection. The building operations ruined the firm, and a claim of many thousands of pounds on the Government for extras is still unsettled.

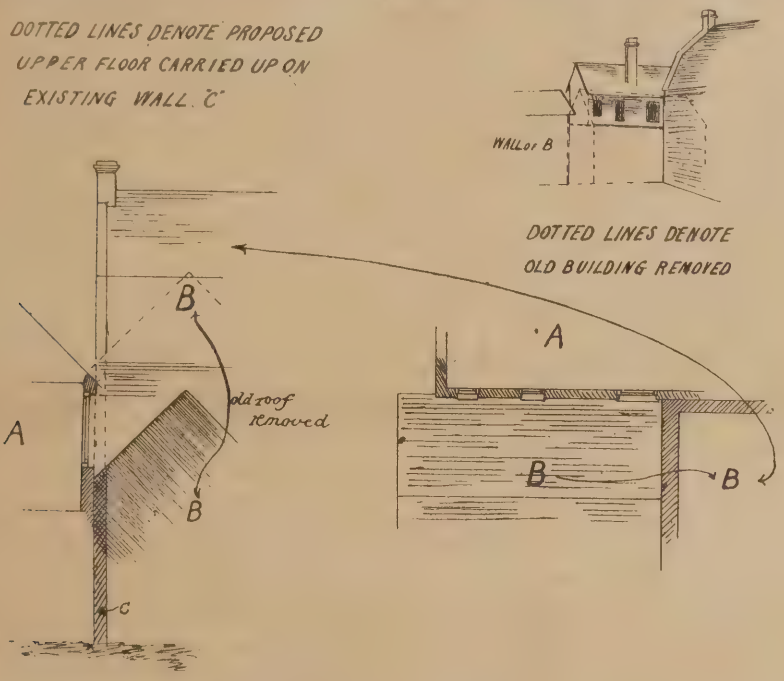
"How is the Future Workman to be Trained?" was the title of a lecture delivered by Mr. George Ellis before the members of the British Institute of Certified Carpenters recently, at Carpenters' Hall, London Wall, E.C. The lecturer advocated the establishment of numerous apprenticeship schools, organised and managed by a joint committee of masters and men, to which boys should be indentured for a term of years. The first year should be spent entirely in the workshop of the school, and the succeeding years partly in the works of the affiliated firms and partly in the school. This would enable the boys to be trained rapidly both in theory and practice. The cost of maintaining the schools could be met by contributions of the employers, local taxation, and the premiums paid by the parents of boys apprenticed.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Ancient Lights.

Potton.—W. H. R. writes: "I should be glad of your assistance on a question of ancient lights arising as follows:—Owner of property B has pulled down one-storey building (see accompanying sketch), with the exception of wall C, intending to carry that up for a new bedroom (see dotted lines). The removal has revealed bedroom windows in adjoining property A, a building about twenty-five years old. As these windows were quite hidden away—not only as shown on sketch, but by trees and buildings—no one concerned with property B knew of their existence. They seem to have been put there without consent or knowledge, but there is no doubt that two of them have existed for more than twenty years. Present owner of A is unwilling to arrange for alternative rights on own or other side of bedrooms, although owner of B is willing to bear expense. I believe that if a right is blinded or obstructed no right can be established. I would be glad to know if, in your opinion, there has been such blinding or obstruction to a sufficient extent in this case."



A QUESTION OF ANCIENT LIGHTS.

This is a somewhat unusual case—in fact we do not know that any similar one has ever been contested. Apparently A has acquired a right of light to his windows, and that without B having ever been aware of the existence of the windows, and could obtain an injunction to prevent B from building so as to obstruct his light to a greater extent than it was obstructed while the one-storey building existed. This could only be upset if fraud could be proved against A; but it could hardly be fraud upon his part to keep his own counsel. For nineteen years and a day he ran the risk of his windows being discovered and immediately blocked by B, evidently doing so deliberately with the object of securing the permanent advantage which he has now legally obtained, and of which he can hardly be deprived. G. A. T. M.

"Fixed" Inks.

Bradford. — Thick Ink writes: "Most Chinese or Indian inks mixed in the ordinary way have a tendency to run when brushed over. Can this in any way be prevented?"

Yes, by rubbing down the ink with a little ox-gall or soap. "Fixed" inks can be bought in bottles.

Laying out New Roads.

Ashford.—Freeholder writes: "What would be the approximate cost of making a roadway through a clayey meadow the highest point of which is 9ft. 6in. above the lowest? The road will be 40ft. wide. There will be separate pipes for soil and surface water, and the houses will have no basements; so nothing lower than the ground floor will require to be drained. The existing sewer in the lower road is said to be about 6ft. deep. The road would be about 1,200ft. to 1,400ft. long. What would be a fair rough estimate, say, per ft. super. to include everything (pipes, manholes, ventilators, gulleys, &c., curbing and metalling), so that the authorities would take it over? Please also name a good practical book on roadmaking, both as to construction, law and the requirements of local authorities."

Before "Freeholder" can obtain an accurate estimate of the laying-out of the suggested new road in a manner "so that the authorities would take it over," it would, of course, be necessary to know the exact requirements of the local authority with respect to the laying out of "new streets." The requirements vary in nearly every district. It may guide him, however, if we give the approximate cost of forming and laying out a street under the condition he names, and of the following construction (see accompanying figure), which is customary in the vicinity of London, namely: Excavate to give the required "formation" and contour to carriageway and footpaths; lay in 9in. of good, sound hardcore of broken stone or brick, and overlay with 6in. of broken stone (granite), and thoroughly consolidate both the hardcore and macadam-surface with a 10-ton steam roller; provide and fix 12in. by 6in. granite edge curbing, and channels formed of four courses of 6in. by 4in. granite blocks laid on concrete. The footpaths to be paved with 2in. brick-paving laid on 4in. of Portland-cement concrete, with a crossfall of about 1 in 40. This road is assumed to have two 7ft. 6in. footways and a 25ft. carriageway—total width 40ft. The sewers are assumed to be laid at 5ft. and 6ft. deep respectively for the storm-water and sewage-sewer respectively, with all necessary manholes, gulleys, &c.

The cost of constructing such a roadway would be from 36s. to 40s. per foot of length; *i.e.*, for a road 1,200ft. long the cost would be 1,200 at 36s. = £2,160. It should be understood, however, that any such estimates of cost must necessarily vary with local conditions, and the foregoing is the approximate cost of a roadway formed in the manner above specified in the immediate vicinity of London. Application should be made to the local authority of the district in which the road is to be laid out for a copy of their by-laws as to the laying out of "new streets," giving also the requirements before the taking over of the road. The only book we know dealing with both the construction and the law as to the laying-out of new streets, and also with the making-up of the same under the Private Street Works Acts before taking over by the local authority, is "The Construction of Roads and Streets" (price 3s. 6d.) by Mr. William H. Maxwell, Assoc. M.I.C.E., borough engineer, Tunbridge Wells—which deals fully with the construction of streets as above, as to the mode of adoption of "private streets" by local authorities, and other practical details. X

Floor for Assembly Room.

Ayr.—Construction writes: "Which is the most effective and simple method of constructing an assembly-room floor to give it the spring and resiliency necessary for dancing upon? The floor I have in view will be about 60ft. long by 56ft. wide."

Two replies to enquiries respecting the construction of ball-room floors were published respectively on page 189 of our issue for April 10th and page 104 of our issue for March 13th last. From these replies querist will doubtless be able to obtain the information he desires.

Determining Area of Irregular Piece of Ground.

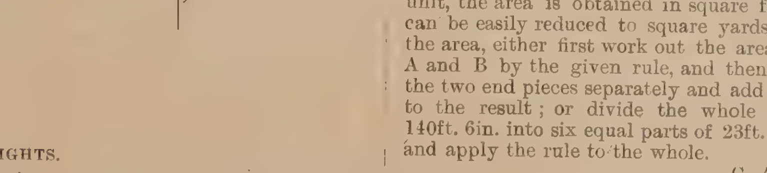
Wrexham.—Cambria writes: "I have been trying to ascertain how to determine the area in superficial yards of an irregular piece of land, and note the article in your issue for April 10th, by Mr. G. A. T. Middleton, but I am not quite clear as to the working of the calculations, it being there in links while I have it in feet. I enclose a sketch of the land."

In order to apply the rule given in the article referred to, the offsets should have been taken at equal distances apart, and this has only been done between A and B. The substitution of feet for links is of course immaterial, as a rule which is correct for one unit must be equally correct for any other unit. If a foot be adopted as the unit, the area is obtained in square feet, which can be easily reduced to square yards. To find the area, either first work out the area between A and B by the given rule, and then calculate the two end pieces separately and add their area to the result; or divide the whole length of 140ft. 6in. into six equal parts of 23ft. 5in. each, and apply the rule to the whole. G. A. T. M.

Air-Space at Rear of Building.

Birtley—B. B. writes: "Several plans of mine have been rejected because there was not a space of 15ft. between an offshot scullery built into the yard and the back wall of the yard itself. If I read the by-law aright, this does not mean the yard wall of the house to be the limit of the distance back, but any adjoining buildings; so that if there were a back street 20ft. wide I could come out to my backyard wall, carry the offshot 20ft. high, and still be within my right, so long as I had 150ft. super. of space in the yard."

Clause 54 of the Model By-laws issued by the Local Government Board states that "every person who shall erect a new domestic building shall provide in the rear of such building an open space exclusively belonging to such building, and of an aggregate extent of not less than 150 sq. ft., and free from any erection thereon above the level of the ground, except a water-closet, earth-closet, or privy, and an ash-pit. He shall cause such open space to extend, laterally, throughout the entire width of such building, and he shall cause the distance across such open space from every part of such building



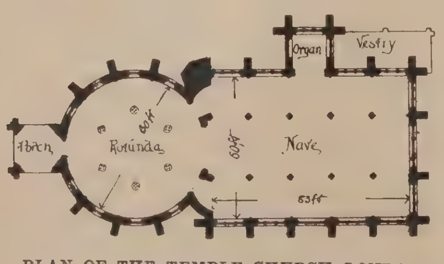
DETERMINING AREA OF IRREGULAR PIECE OF GROUND.

to the boundary of any lands or premises immediately opposite or adjoining the site of such building to be not less in any case than 10ft. If the height of such building be 15ft., he shall cause such distance to be 15ft. at the least. If the height of such building be 25ft., he shall cause such distance to be 20ft. at the least. If the height of such building be 35ft. or exceed 35ft., he shall cause such distance to be 25ft. at the least." Taking this by-law precisely as it stands, the open space must extend throughout the whole width of the building, and at the same time belong exclusively to it, so that it cannot include any adjacent open space such as that afforded by a public road or passage at the rear of the building. From the general statement submitted it would appear that the by-laws operative in your particular district contain a clause closely analogous to the one above quoted. In the case of *Jones* v. *Parry* (which necessitated the determination of the legal construction placed upon a somewhat similar clause) a dwelling-house had been erected which was 25ft. in height at the rear. It was at the same time shown that there was also an open space in the rear of the building, exclusively belonging to the building, of 700 sq. ft., with a distance of 8ft. between the building and the public street, and 52ft. between the building and the boundary of the property on the opposite side of the street. A decision was given to the effect that the public street constituted the "opposite property," and that the local by-law in question required a distance of not less than 20ft. between the building and such "opposite property." Under these circumstances (and in the absence of any definite or specific provision relating to the erection of domestic buildings on sites which abut on two or more streets), the district council may therefore refuse to sanction the arrangement mentioned. T. E. C.

The Temple Church, London.

Kendal.—F. S. writes: "Where can I obtain a description, with illustrations, of the Temple Church, London?"

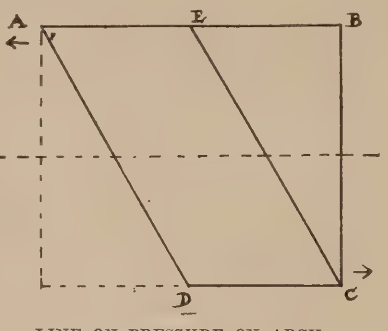
Like most of the churches of the Knights Templars, the original Temple Church, London, was small and circular on plan. It is one of the most interesting examples which we have of the transition from the Norman to the Early English Gothic, with a great deal of rich Norman ornamentation, particularly in the western porch, while internally there are pointed arches and Gothic foliage capitals with pure Norman work above, though necessarily later in date. An inscription preserved in the wall over the west door shows that it was completed and dedicated in 1185 A.D. It runs as follows: "Anno ab incarnatione domini MCLXXXV dedicata hec ecclesia in honore beate Marie A. Dno. eraclio dei grâ sîe resurectionis ecclesie patriarcha IIII idus Februarii q. ea. annatim petêtib de iiunata spenitêtia LX dies indulsit." A choir of three parallel aisles of equal height was added eastwards in a pure and beautiful type of Early English work, with groined vaults and rib-mouldings and with triple lancet windows, and the whole was reconsecrated, in the presence of the king and many of the chief nobility, in 1240 A.D. A careful restoration was carried out about fifty years ago. Notice the absence of agreement between the piers and buttresses of the rotunda. G. A. T. M.



PLAN OF THE TEMPLE CHURCH, LONDON.

Line of Pressure in Arch.

Hamilton.—J. P. writes: "Kindly explain how the 'line of pressure' in a concrete arch on the skew acts. Does it act parallel to the face or at right angles to the abutment; or does it take a mean position between the two? I shall also be glad to have any other information on concrete arches not usually given in text-books."



LINE ON PRESSURE ON ARCH.

The direction, on plan, of the pressure produced by an arch or vault depends on the shape of the area covered, and also, in the case of skew arches, it may depend on the relative proportions of the depth and span. In an ordinary semicircular vault of concrete the horizontal pressure produced by the weight of the crown is uniform, and at right angles to the axis; the result being, in case of weakness, a parallel fracture along the haunches. If a portion of the vault be cut away obliquely as at A D in the diagram, then obviously the pressure of A B C D will be unequal and converge towards C D. But if E B C be also cut away, uniformity of pressure is restored, though not at right angles to the axis, but parallel to the faces of the arch. This obliquity is the cause of the inherent weakness of a skew arch, viz., its tendency to slide in the directions indicated at A and C; and the fractures due to pressure would not be parallel to the axis, neither would they be square with the faces of the arch, but assume a direction somewhere between the two. The depth of a skew arch of fixed span may, however, be increased until the effect of oblique pressure is quite neutralised by the length of the vault; the pressure is then practically square with the axis, only assuming an oblique direction towards the ends, and the lines of fracture would take a direction generally parallel to the axis.

For arches and vaults not subject to unusual strain or vibration concrete is perhaps the most suitable material, especially for intersecting vaulting and skew arches, where the jointing, if in brick or stone, would necessitate an amount of labour hardly appreciated in these days excepting by the workman.

Then, again, a vault of concrete may be readily graduated in thickness to meet statical requirements, while the use of Portland cement will allow of the general tenuity of the shell being maintained, and consequently of a limitation of the weight—advantages that increase with the size of the vault. For very large contracts, when the cement is sometimes delivered fresh from the mill, it should be cooled by spreading it on the dry floor of an enclosed shed before using; this precaution will correct the expansive or "blowing" property of the cement, but if neglected there may be some risk of a vault rising at the crown if the abutment remains firm. As a binding aggregate there is no better material than clean hard broken brick or stone chippings; the gauging and mixing should have constant supervision, and the concrete should be laid on the centering in a uniform manner, in courses the full thickness of the shell, and not more than 2ft. or 3ft. in height; thus the liability of the loose material to slip over the work below is lessened, and the setting is uniform. By completing both sides of a vault simultaneously, or the whole ring of a dome, as the case may be, the weight on the centering is equalised. The haunches of a vault are generally solid concrete up to about one-third of the height, and this portion should be incorporated with the enclosing walls by forming projections or toothings on the walls not less than 6in. apart. In addition to these toothings, stone landings may with advantage be built across the angles of square compartments, to distribute the weight of a groin or a pendentive; and for some height above the springing the curve, in this case, is best formed with the walling, in horizontal courses. The springing of a vault or arch of concrete should not, if it can be avoided, be let into a chase; the wall should either be reduced in thickness at this level, or corbelled out, so that the walls and piers may be completed independently of the concrete.

For a concrete floor over a vault enclosed by walls the upper part of the haunches may be filled in with a lighter material such as dry brick rubbish, but it is better to convert this into a light kind of concrete, say, eight or ten of broken brick to one of lime, thrown in but not rammed. When a vault is large it is still better to build transverse walls 4ft. or 5ft. apart, to support a thin concrete floor cast *in situ*, leaving temporary openings through which the centering can be got out. Empty spaces should be ventilated. In very hot weather the concreting should be done under tarpaulin covers. Needless to say, the striking of the centering should not be hurried. J. A. M.

French Architectural Journals.

Newcastle-on-Tyne.—B. P. writes: "Can you tell me what are the architectural papers in France that are equivalent to ours? I want some illustrations of modern Parisian fronts, and also of drawings to which the Prix de Rome and other prizes have been awarded in recent years."

This enquiry respecting architectural papers in France has been replied to several times in these columns. So far as we have been able to ascertain, such papers are very few indeed, thus being very different to the United States and Germany; but we have recommended "La Construction Moderne," a paper published weekly and to be obtained from Messrs. Grevel & Co., 33, King Street, Covent Garden, W.C., price £1 15s. per annum. Subscriptions start only from April 1st and October 1st.

Phœbe Hearst Competition, California.

Newcastle-on-Tyne. — B. P. writes: "I should be glad to know where I could obtain illustrations of the prize scheme for the Phœbe Hearst architectural competition for the University of California, other than the odd one or two published in the papers here."

An article on this competition, written with the assistance of Mr. John Belcher (one of the assessors), was published in the "Architectural Review" for March, 1900, together with full-page illustrations of the premiated designs; but if querist desire complete illustrations and particulars, he had better obtain the large pamphlet which was issued by the trustees, whose address was Room 3, 217, Sansome Street, San Francisco, California. Considerable space was also devoted to the matter in the "California Architect and Building News" (408, California Street, San Francisco), the first premiated design, by M. Benard, of Paris, being fully described and illustrated in the issue for September, 1899. The subscription to this journal is 3 dollars a year.

The Westminster Abbey Fiasco.—Mr. J. T. Micklethwaite, surveyor to Westminster Abbey, writes to "The Times" correcting the exaggerated report about the recent fall of a small marble shaft in the Abbey. This fell from one of the windows through the giving way of an iron pin which had held it in its place for six centuries and a half. "The failure is a curious one from a mechanical point of view, but it does not in any way affect the stability of the building. Indeed, except from the surface decay of the stone, which is a very serious matter, there is no part of the church in a condition to cause anxiety."

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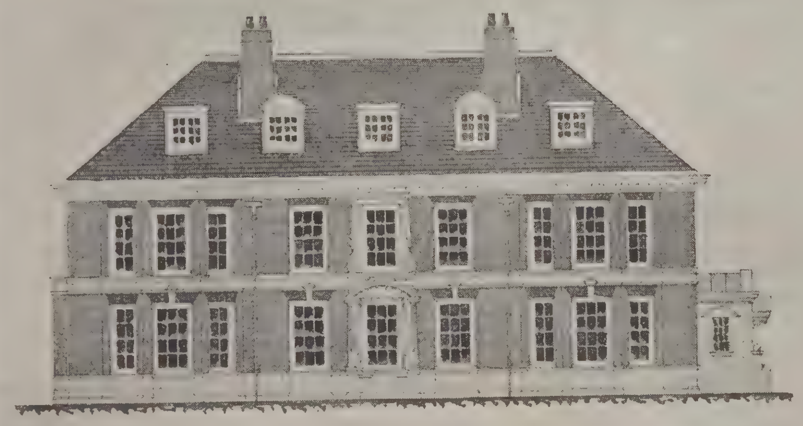
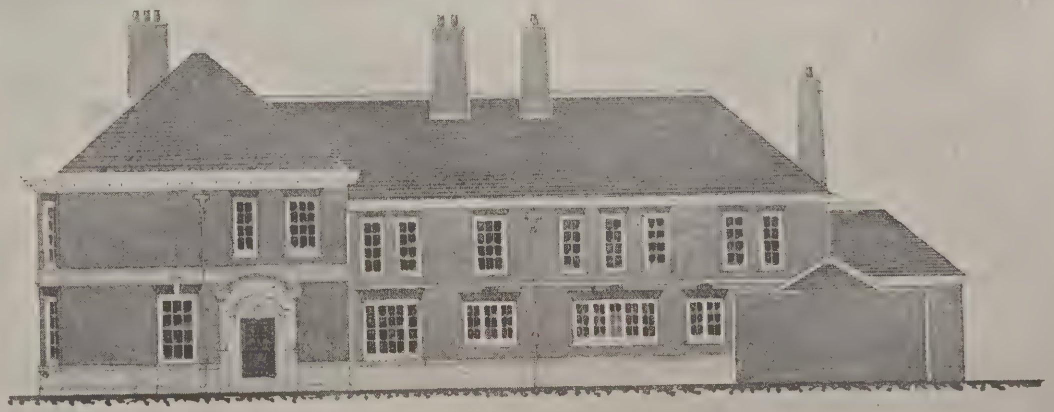
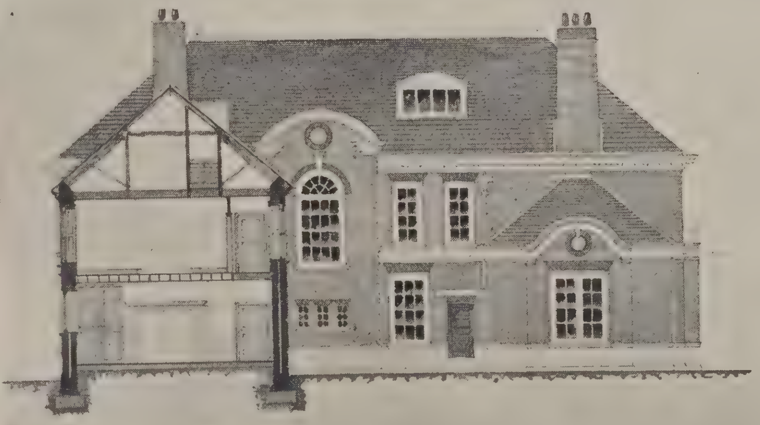


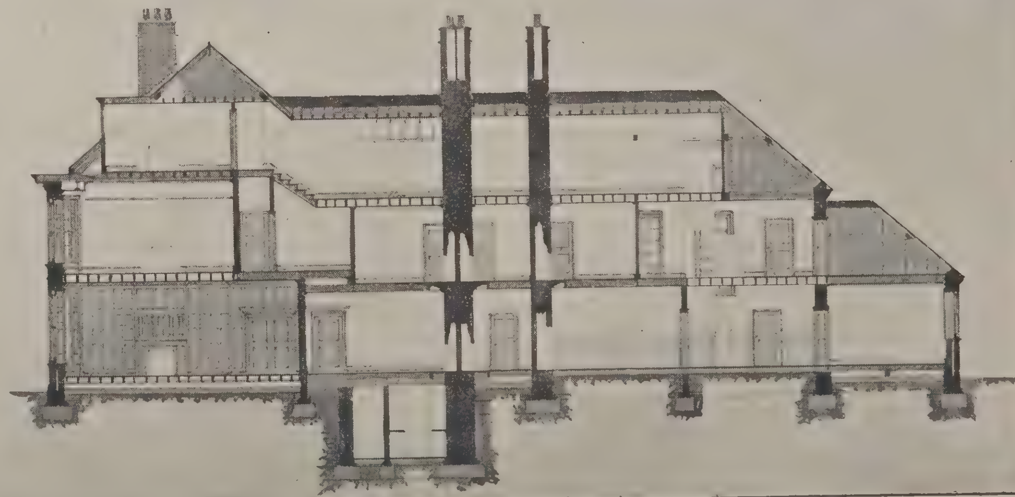
South Elevation.



East Elevation.



Section on Line E. F.



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A SURREY HOUSE. A. E. STREET, M.A., F.R.I.B.A., Architect.

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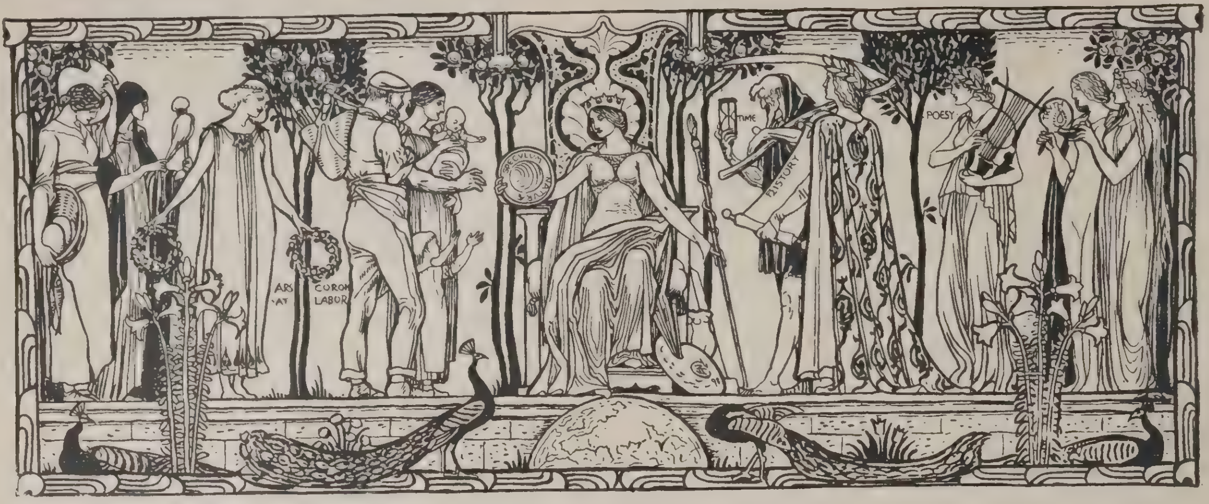
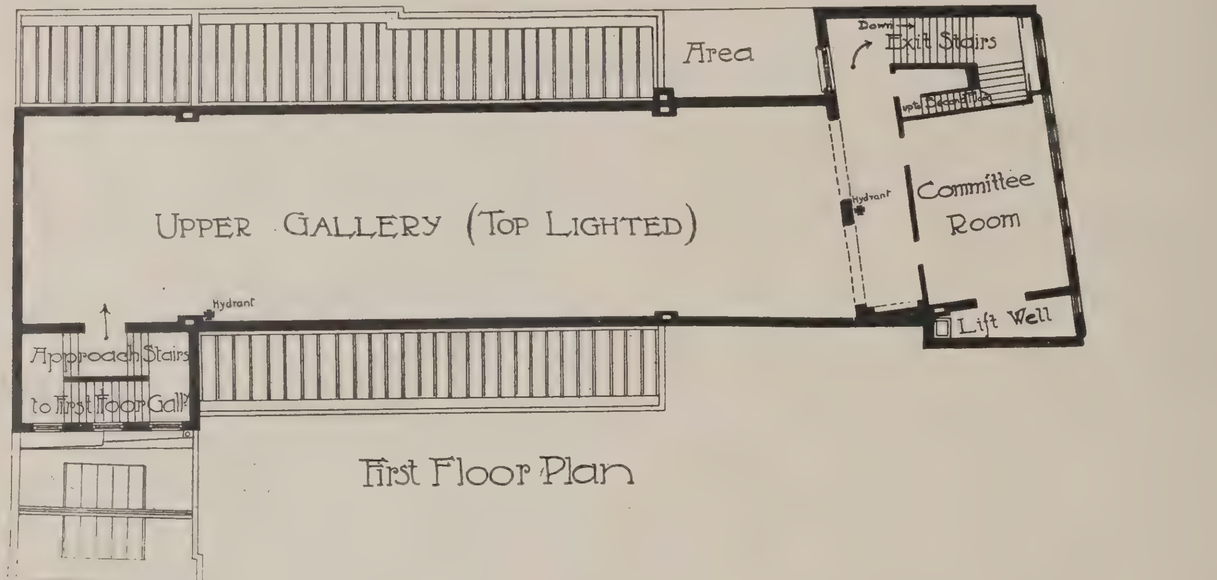


THE SPHERE AND MESSAGE OF ART. Sketch Design for the Mosaic Panel by WALTER CRANE.



THE NEW ART GALLERY AT WHITECHAPEL. C. HARRISON TOWNSEND, F.R.I.B.A., Architect.

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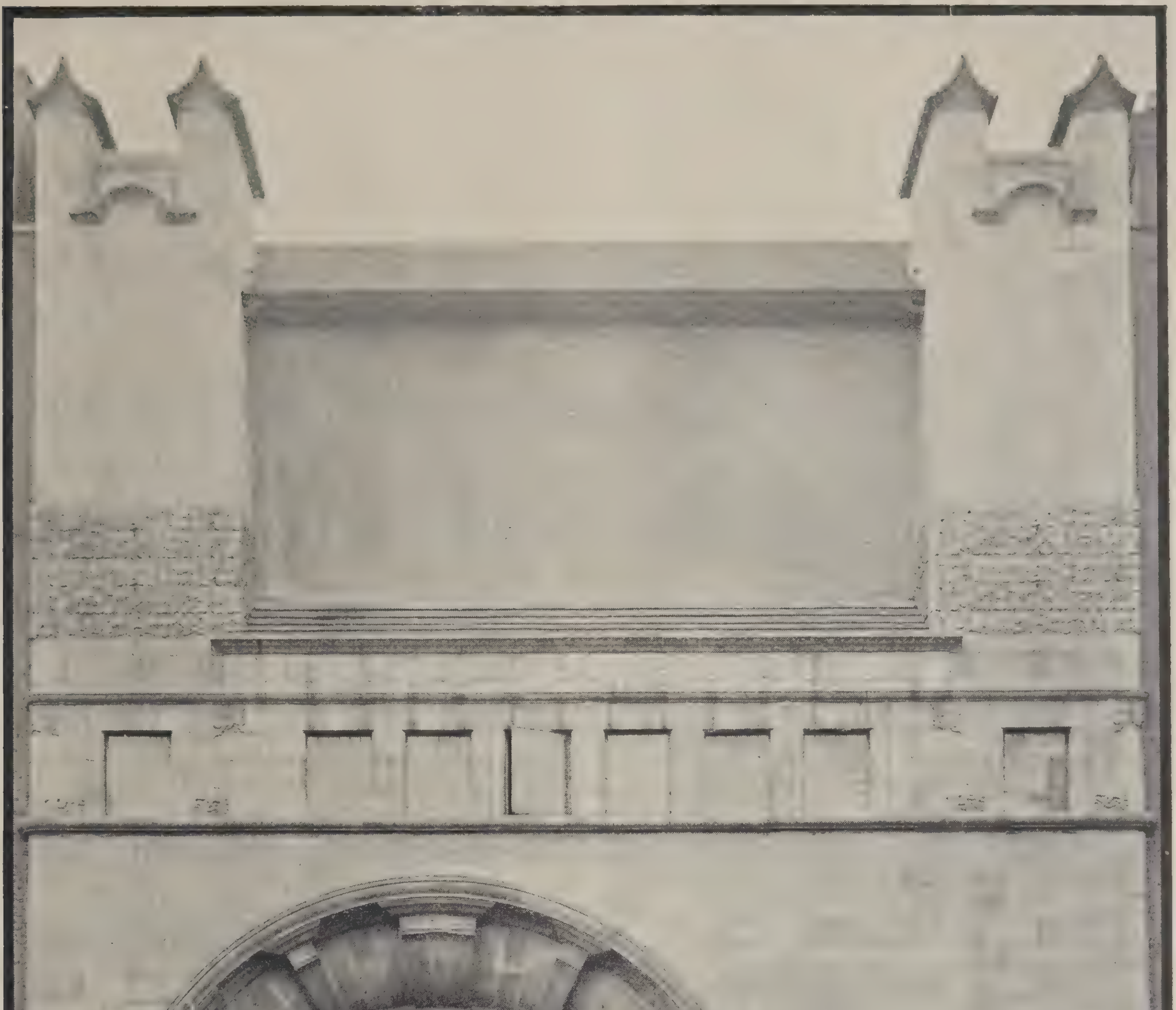

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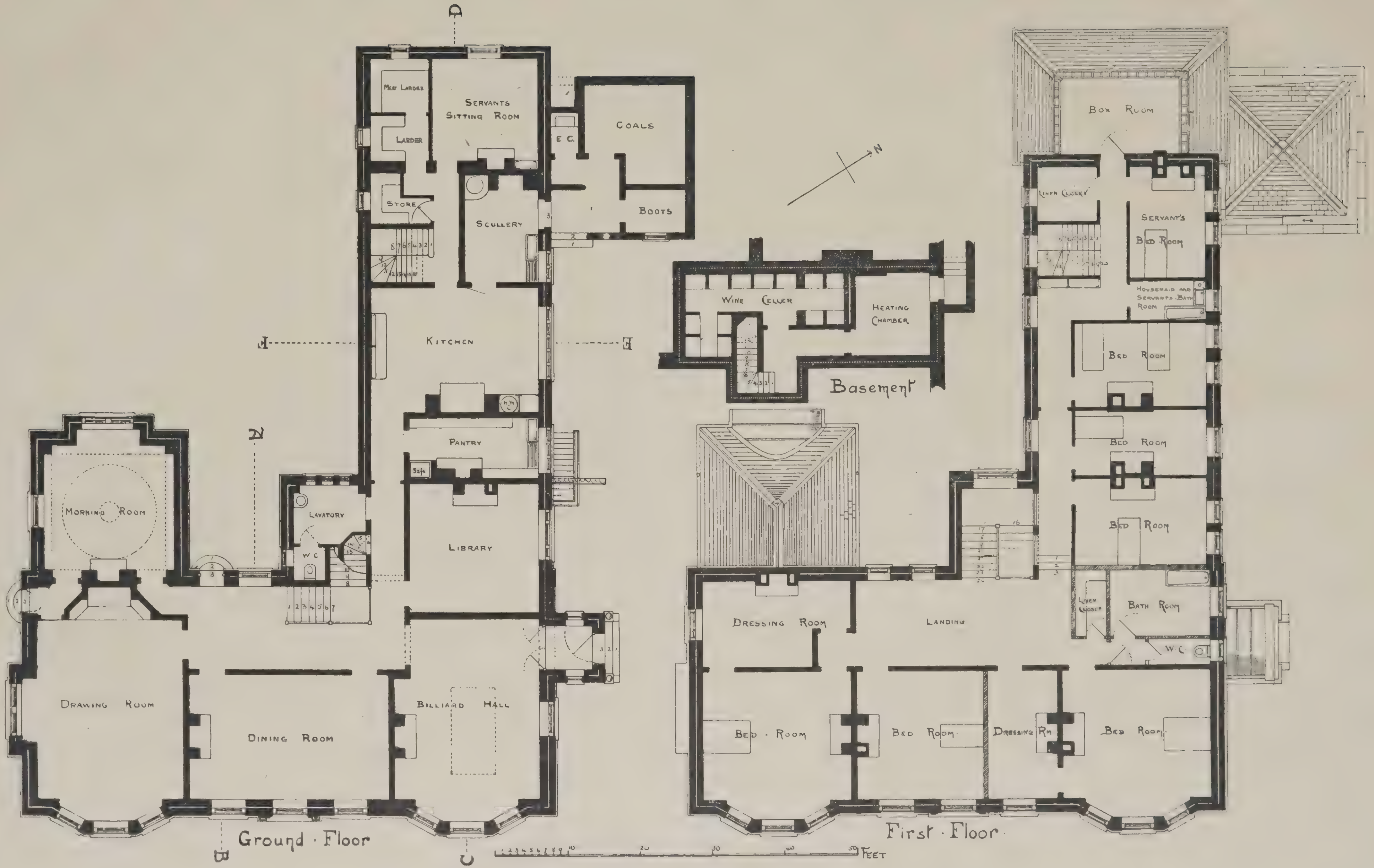

PLANS OF A SURREY HOUSE. A. E. Street, M.A., F.R.I.B.A., Architect

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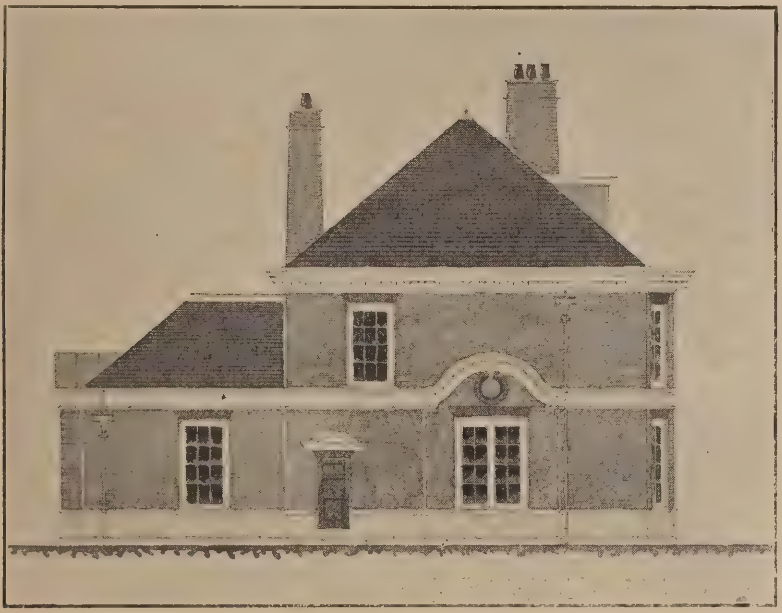
Bricks and Mortar.

APHORISM FOR THE WEEK.

Art is Nature's rival.—APULEIUS.

Our Plates. THE materials to be used for the house in Surrey designed by Mr. Arthur Edmund Street, of 37, York Street, York Place, W., are Bracknell red facing bricks with Horsham stone dressing and Westmorland green slates for the roof.—The development of the Art movement in Whitechapel has been steady, encouraging, and sure. Separate, suitable and permanent accommodation has now been obtained in the new gallery, opened on March 12th with a fine and representative exhibition of English art. As an evidence of its success, we may state that during its first five weeks 190,000 persons visited it. The new building is next door to the Public Library in the High Street, and occupies a peculiarly difficult and awkward site. Apart from its restricted area, which makes it necessary to have a second gallery on the first floor in order to secure adequate accommodation, the site is not rectangular, and this has considerably increased the architect's difficulties. The party-wall troubles have also been a source of worry, and the question of entrances and exits, in order to secure the necessary circulation of visitors, has occasioned considerable trouble in planning. The lower gallery consists of a nave and two aisles. The two latter, being top-lighted, supply light to the nave. The necessity for an upper gallery prevented a direct light being given. The total length of this gallery is 100ft., and it has a total width, including the aisles, of 48ft. At the rear of the building is the approach staircase to the first floor, and just beyond this, to the left, is a small annexé, top-lighted, which can be used, if required, for special exhibits. The main staircase has been placed at this end of the gallery to enable visitors who have viewed the exhibits there to ascend to the upper gallery without retracing their steps. In the same way visitors who have passed though both galleries will leave by the special exit stairs in the front of the building, the meeting of two streams of people entering and leaving, being thus avoided. The upper gallery, on the first floor, is 120ft. long by 26ft. wide, and is top-lighted. On the same floor is the committee-room, lighted by small windows on the front. On the second floor is situated the caretaker's rooms and store-rooms. In the basement there is a heating chamber with separate cellars for coal and coke, with shoots from the pavement. The main front is of buff terra-cotta by Gibbs & Canning, of Tamworth. A large mosaic panel 25ft. long and 13ft. high will form the principal decorative feature of the elevation. It will cover the recess between the two turrets, and have a protection from the weather in the pent-roof above. Two or three designs for the panel have been prepared; but that by Mr. Walter Crane, illustrating "The Sphere and Message of Art," is the one that will be carried out. We give a reproduction of Mr. Crane's sketch design. The gallery will accommodate about 450 pictures on the two floors. The building is also adapted for concerts and meetings when not in use for exhibition purposes, and the architect, Mr. C. Harrison Townsend, F.R.I.B.A., has still under consideration the question of a further exit at the rear of the premises. The contractors for the work were Messrs. J. Outhwaite & Son.

Disappearing London. IT seems that a number of picturesque old buildings in Royal Mint Street will disappear shortly in connection with the Tower Bridge improvement scheme. They stand right in the path of the approach, from the Middlesex side, to the bridge, face the north-east angle of the Tower, and overlook the open space known as Little Tower Hill. The houses form, with those beyond, the base of a triangle of ancient buildings. Between the two lies a little street, one of the many "King Streets" in the Metropolis. But this "Tower" King Street leads from nowhere to nowhere. At the corner of King Street, at the northern entrance, is a specimen of eighteenth century architecture, the Crooked Billet Tavern, having a high pitched red-tiled roof, with dormer windows. Generally speaking, the house is in its original condition. Its front, overlooking Little Tower Hill, has been rebuilt, and is not interesting, but the King Street side keeps its original entrance, and the usual formal pilasters with a frieze of the Greek honeysuckle in plaster.



A SURREY HOUSE: WEST ELEVATION. A. E. STREET, M.A., F.R.I.B.A., ARCHITECT.

Chichester Cathedral. THE north-west tower of Chichester Cathedral, which has been rebuilt at a cost of over £8,000, was dedicated recently by the Archbishop of Canterbury. No authentic records are in existence as to the exact circumstances in which the old tower fell, but the disaster is supposed to have happened about the year 1634, the cause most probably being the defective nature of the foundations. Not until the episcopate of the late Dr. Durnford were any active steps taken towards the rebuilding of the tower. When a fund was started for the general restoration of the cathedral the executive committee found that, owing to the insecurity of the west bay of the nave vault, the rebuilding of the north-west tower was the work which most demanded attention. The late Mr. J. L. Pearson prepared a design for the rebuilding of the tower, which, subject to certain modifications, was ultimately adopted. The south side of the tower, forming part of the nave of the cathedral, was intact, although the arches of the triforium and clerestory stages were walled up. All that remained was to carry the same design round the three remaining sides, but there was a good deal of controversy as to the character of the exterior of the building before a satisfactory agreement was arrived at. Messrs. Luscombe & Son, of Exeter, were given the contract for the work, which was carried out in sections, the money for each section being first obtained in subscriptions before the next stage was proceeded with. Mr. Frank Pearson succeeded to the duties of architect on the death of his father. The new tower, which resembles in its general character the south-west tower, is about 34ft. sq. over all, and from floor to ceiling, a height of nearly 100ft., is open to the cathedral. The work has occupied about 2½ years.

St. Sidwell's, Exeter. DEDICATED to St. Sativola, a British saint of whom Professor Freeman seems to be dubious, the original church, St. Sidwell's, Exeter, seems to have disappeared, the present having been built in 1813. At some period or other the red Heavitree stone was covered with plaster. When this was removed it was found that the tower had been in large part transformed from its fifteenth century character, and that a good deal of brick work had been introduced. Enlarged and improved in 1871, the church was afterwards cased with grey stone, in striking contrast with the red stone of the tower. A few years ago a steeple which had been stuck upon the tower was removed, and now the tower is being restored to its early character. In the lower part is some of the fifteenth century work, and the remainder of the structure will be renewed in the style of the Perpendicular period. This restoration will cost about £3,000.

Evolution of Japanese Art. MR. WALTER BEHRENS recently read a paper concerning evolution in certain forms of Japanese art before the members of the Japan Society. Mr. Behrens did not deal with Japanese art forms in general, but confined himself almost altogether to a brief discussion on various forms of netsuké and their uses. He remarked that his subject was naturally not touched upon in any Japanese writings, as the idea of evolution was comparatively modern, and he believed that the Japanese had only arrived at it through our aid. The matters he had to speak of had not been touched on in any records, and the only documents he had were actual examples he had seen, so that he feared his researches must always remain empirical. He was certain that evolution was to be found in the art of Japan. This art was so closely connected in its origin with the art of Corea, of China, and other countries, that it was difficult to come to decisive conclusions. All who had collections of Japanese art work would note that such dates as were inscribed or added to signatures gave no trustworthy information as to the actual period of production. He feared that Japanese experts, like Roman authors, must laugh in their sleeves when they met; at any rate, their theories were remarkable for their divergence. It might be suggested that in Japanese art, shackled by convention, the germ of development had been sterilised, but signs of alteration and life were visible. Once the use of the brush had been acquired any change in the resultant use was not so much evolution as a change of taste, and taste was nearly always an accident, not a growth. By this he implied that taste, like fashion, generally received its impulse from one individual, and its effects were therefore arbitrary. Evolution was change that was unconscious and practically imperceptible. His studies had all been directed to the investigation of objects in personal use among the Japanese, particularly of the netsuké, or the elaborate ornaments by which objects were suspended from the girdle. Mr. Behrens said it seemed to him likely that it was from the seal form that netsuké in their various presentments rose. It was highly probable that before the netsuké *qua* netsuké came into being it was a seal. Seals both in China and Japan dated from long before the Christian era. Most of the early netsuké were figures of men or animals carved in ivory. The seal was a very important adjunct with the Japanese, and was a much greater indication of identity than a signature. Hence father and son had different seals, and copying a seal was a much worse offence than forging a signature. In lacquer and metal work the evidence of evolution was more ready to hand than in the case of netsuké, but nevertheless there was a wide field for research in this direction also.

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Law Cases.

Mrs. Langtry's New Theatre: The Contractors Fined.—Messrs. John Allen & Son, Ltd., contractors, of Palmerston Works, Kilburn, were summoned at Westminster last week for obstructing the free passage of the highway at Tothill Street, Westminster, by allowing a quantity of rubbish and building material to remain on it. Sergeant Haines, 42 A, said that the carriageway was largely obstructed during the reconstruction of the Imperial Theatre. There were iron asphalt boilers, heaps of rubbish and coke-breeze, mortar, &c., for a space of 30yd. by 4yd. Inspector Cussins said that for weeks the roadway had been quite blocked. Counsel for the defence took several objections to the summons, and urged that there was no more obstruction than was consistent with extensive building operations. The Police Act exempted builders' materials. The magistrate said it was evident the police had recognised the difficulty under the Police Act, and had, therefore, gone under another statute. He had to look after the public and not individuals. He fined the defendants 40s. and costs on each of the three summonses.

A Sequel to the Funeral Procession.—Several summonses were heard at Westminster last week against the occupiers of premises in the Victoria district for infringements of the London Building Act by erecting structures without the consent of the London County Council. Mr. Chilvers, who supported the summonses, said that they were taken out in consequence of structures put up on the occasion of the funeral of her late Majesty the Queen. Some of the erections were in shop windows, and one on the roof of a house, and he submitted that these were structures for which plans should have been approved. The stands were put up at the last moment, and sometimes in a very loose manner; and unless they were submitted to the Council the district surveyor had no knowledge where they were. Fines varying from 5s. to £2 2s. were imposed.

Apportioned Cost of Paving New Streets: Interesting Decision.—The case of the *Property Exchange (No. 1)* v. *the Wandsworth Board of Works* was heard in the King's Bench Division of the High Court of Justice on Thursday last. This was an appeal by case stated from the order of a metropolitan police magistrate ordering the appellants to pay to the respondents the sum of £69 11s. 3d., the amount of the expenses apportioned to them of paving an alleged new street called Totterdown (on the north side thereof), Tooting. The Court dismissed the appeal. The Lord Chief Justice said that there was a good deal to be said for the view that, where a road was so altered that practically a new street was made out of what was an old highway, it might not be unreasonable to treat it as a new street as to the whole. But the decisions were too strong for that view to be taken. It was not disputed that where premises fronted on a new street, then, though the paving was only as to part of the street, the frontagers on both sides of the street were chargeable. That was decided in *Vestry of Mile End* v. *Guardians of Whitechapel*. But in the case now heard the respondents' counsel contended that where there was a highway, and a new part is added to it by the frontagers of one side, then that part was the new street and not the whole roadway. His lordship was of opinion that he was right, having regard to the authorities. In *Richards* v. *Kessick*, which was decided under the Public Health Act, the Court of Queen's Bench held that for the purpose of the Public Health Act a strip of land added by the adjoining owners to a highway formed with the houses a "street." Mr. Richards, counsel for the appellants, did not deny that that case in principle bore upon the matter, but he said that it was under a different Act from that now in question. The question was whether there was any real difference in principle between the two Acts. In *White* v. *Fulham Vestry* the facts were much the same as in the present case, with one difference—namely, that an older portion of the roadway had become a new street since 1855, and the frontagers had paid the expense of paving it. Then a new bit was added, and it was held that the added portion was a new street and that the expenses of paving it ought to be apportioned among the frontagers on that side only. Mr. Richards had pressed them to say that the sole ground of that decision was that the frontagers of the original part had already paid. That was true, but when one looked at these judgments, both in that case and in *Richards* v. *Kessick*, one saw that the Court held that the new strip was the street or new street. It could not, in his Lordship's opinion, matter whether the original part was a new street made up under the Act of 1855 or an old highway. He thought that the learned magistrate was right in following the authorities, and that the added piece was a new street. Mr. Justice Lawrance concurred.

Masters and Men.

Building Dispute at Newmarket.—The carpenters and bricklayers employed in erecting the new Great Eastern Railway Station at Newmarket struck work last week, the contractor having employed other men to lath and slate the roofs, which the strikers consider to be their work.

Building Dispute in Berlin.—The "Vorwärts," the German Socialist organ, states that the Union of Master Builders of Berlin has determined to lock out until the end of the week all workmen who leave off work on May 1st. As May 1st falls on a Wednesday this action would mean the loss of four days' wages to the men.

The Bricklayers' Labourers at Barrow have struck because the master builders decline to advance wages from 6½d. to 7d. an hour. The latter is the rate paid to labourers working at Vickerstown, but this is because they have further to go. The building trade is very brisk in Barrow, and the strike will cause much inconvenience.

The Aberdeen Operative Plasterers, who have been on strike nearly seven weeks, have accepted a compromise offered by the masters as a basis of settlement of the dispute. The employers proposed to reduce wages from 8½d. to 7½d. an hour, but the men rejected these terms and came out on strike. As the result of the conference, the masters agreed that the wages be 8d. per hour, and the men have now accepted that rate.

The Belfast Carpenters' and Joiners' Strike, which has continued for fifty-one weeks, has now been settled at a conference of the disputants. The Very Rev. John M'Mullan, C.P., rector, Ardoyne, acted as arbitrator. The men return to work under 1899 Rules, except that Rule 1 now reads, "54 hours per week, 12 o'clock stop on Saturday, 8½d. per hour," and Rule 4 "Outside the Boundary lines men to be paid extra for a mile or a part of a mile, 2s. per week; above 1 and not exceeding 2 miles, 3s. per week; any distance between 2 miles, 4s. per week." Where these extras are paid, men are to work the usual hours as if employed in Belfast. No reduction is to be made in wages for two years, and an advance to be given in May 1902 if trade warrants it.

The Effect of "Combines" on the Workers.—Speaking recently at Motherwell, at the annual meeting of the employees of Parkneuk Bridge Works, ex-Bailie Findlay, the managing director of the company, said he believed in individual effort and enterprise, and did not wish to see them dominated by those huge combines which often crushed out the independent and smaller trader or manufacturer in order to be able to dictate their own prices. These combines were so imbued in the commercial spirit that the sole problem seemed to be how to swell the profits, and the workmen were mere parts of the machine. The spirit of American push-and-drive, and the "firing out" of unsatisfactory workmen and men who had passed the age of forty, especially under big combines, might result in large bodies of employees being driven hither and thither like flocks of sheep, till, like the worm when trod on, they turned, and great industrial disorder and distress would ensue. It was true that higher wages were paid to the American artisan than is the rule here, but his hours were longer, and he went at his work with a much keener intelligence and energy, his usual pace being what we associate with piece-work. But a skilful and energetic man here, working on piece-work, was as well off as in America or the continent of Europe. There was one striking point in America, and that was that the average workman there was somehow more self-respecting than we find him here, and an unsteady workman was practically unknown in that country.

New Patents.

The following specifications were published on Saturday last, and are open to opposition until June 3rd. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—5,659, Wright, setting for cements. 5,953, Eccles, weatherboard for doors. 6,318, Loehle, roofs. 6,338, Von Hedemann & Von Hedemann, slabs or panels of plaster of Paris. 6,819, Baumer, instruments for surveying and plotting without calculation. 6,920, Williams, cranes and hoisting apparatus. 8,002, Koerfer, glass bricks or blocks. 8,224, Goldie, structures for the bacterial treatment of sewage. 8,638, Löblich, distributing valves for baths. 8,818, Lewis, slate mantelpieces. 8,822, Boys, tool-grinding appliances. 8,973, Genese, acetylene lamps. 8,995, Wise (firm *Xav. Reichlin*), apparatus for closing doors. 9,601, Seefels & Soldan, constructing fire-resisting and ventilating floors, ceilings, &c. 9,654, Hamblet & Parkes, dies for making socketted conduits. 9,673, Braun & Morrison, window blinds. 9,779, Feeny (*Spaulding*), sash locks. 9,862, Smith, siphons for cisterns. 10,266, Shanks & Burnside, water-supply taps and valves. 14,365, Borgars, brick. 20,257, Douglas, apparatus for cooling air. 21,638, Kaeferle, unions for pipe joints. 23,651, Grastorf, construction of ceilings, roofings, &c.

1901.—478, Kautny & Lotz, acetylene-gas generators. 2,226, Huxley & Henry Simon, Ltd., machines for measuring powdered materials. 2,268, Lake (*Fried. Krupp Grusonwerk*), presses for the manufacture of lead and other pipes. 2,481, Riedel & Schiegner, dies for brick machines. 2,921, Garvens, pumps. 3,040, Newton (*Savery*), machines for winding lengths of paper in rolls. 3,301, Hargrove, door springs. 3,552, Tomkins, guiding lifts and elevators.

Engineering Notes.

Bill for widening London Bridge.—On Thursday last in the House of Commons this Bill was ordered to be read a third time.

Electric Lighting Extension in Leeds.—It is proposed to borrow half a million of money for electric lighting purposes in Leeds, and a Government enquiry on the subject was held last week.

Electricity on the Underground.—The schemes for adopting electricity as the motive power on the Metropolitan and Metropolitan District railways are being developed with as much rapidity as possible, but as yet no particular system has been definitely settled.

A Newcastle Railway Scheme.—The North-Eastern Railway Co. is now inviting tenders for a scheme for continuing the old Blyth and Tyne line from New Bridge Street, Newcastle, to near the Manors, and of improving and enlarging the station accommodation at that part of the town.

Northampton Tramways.—The Northampton Corporation have decided to take steps to acquire, by compulsory powers, the Northampton Streets Tramways. The committee acting on behalf of the Corporation offered £37,500, and the tramways company asked £45,000. The total cost of the undertaking, which has been in existence twenty years, was £56,000.

Institution of Mechanical Engineers: President's Address.—Mr. William H. Maw delivered his presidential address to this Institution on Friday evening last. We have received a copy of it through the courtesy of the secretary, but are obliged to hold over our report, with some comment, till our next issue, owing to the great pressure imposed on our space by the Building Trades' Exhibition.

GLASGOW EXHIBITION.

PRESENT CONDITION OF THE BUILDINGS.

A WALK through the Kelvingrove enclosure at Glasgow will convince the visitor that there is not a minute tosp are if the public are to be enabled to survey the grounds and Exhibition buildings with satisfaction by the beginning of May. But while that is so, says the "Glasgow Herald," one ought not to take too pessimistic a view of the situation, as the work which yet remains to be accomplished is of such a character that rapid progress towards the completion of the whole undertaking can be reasonably expected.

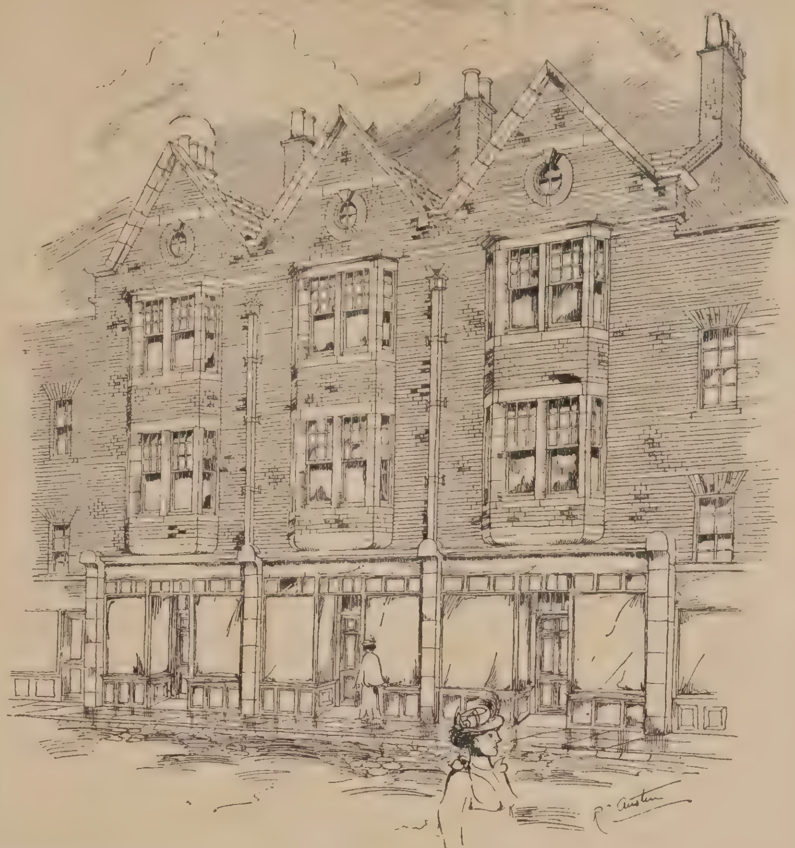
Starting from the east end of the park, the visitor's attention is first arrested by the Russian buildings. Of the four pavilions, the one devoted to agricultural exhibits is nearest completion. Externally little remains to be done. The decorations, which are in harmony with the quaint and picturesque design, and have a highly artistic effect, are almost completed; and so far as one can judge from the examples of the Russian painters' skill on the surrounding buildings, a brilliant contrast in rich colouring is being aimed at. Large cases containing exhibits are stocked in the interior of the agricultural hall, and this section should be in an almost finished state in a fortnight.

The mineral and forestry pavilions are not so far advanced, and upon the large octagonal kiosque intended for the reception of distinguished visitors joiners are still employed. The Irish squireen's house, with its rough-cast plaster walls and thatched roof, stands in striking contrast to the ornate Russian display in the vicinity. On either side of the unbarked timber porch which gives access to the interior tall shrubs and hedgerows have been planted, and they add a delightfully realistic touch to the surroundings.

The Canadian Pavilion was among the earliest buildings to be finished, and the various sections of exhibits are almost ready for inspection. Passing into the Concert Hall the visitor notes that here at least there is room for gratification. The interior of the spacious rotunda is ready for the reception of over 4,000 people, the decorations are completed, and the organ-tuners are at work. The walls of the grand entrance to the hall are being adorned with a coloured tile design, and the reception-rooms for the royal visitors are in an advanced state. Emblematic figures are now in position on the balconies of the main facade of the Industrial Hall, the centre of the peristyle, and the top of the dome. From an artistic point of view, however, they cannot be pronounced a success. Owing to the weight of the outspreading wings the draperies have been utilised as a counterpoise. Cement pavement is being laid in front of the peristyle, and the neighbouring terraces have been put in order.

The new and the old bridge over the Kelvin is now merged into one, and the improvement thus effected in the approach to the main facade cannot fail to be noticed. The avenue leading from the Dumbarton Road Bridge along the slopes of Gilmore Hill is studied with small buildings in a more or less advanced state of construction. The principal restaurants are in the hands of the decorators; and there need be no fear of unpreparedness in this important department. On the leading thoroughfares of the park large supplies of road metal and gravel have been deposited, and whenever circumstances will permit the paths which have been cut up with the heavy traffic will be converted into fine promenades. With a spell of good spring weather the grounds should in a short time assume an aspect that will blend harmoniously with the picturesque buildings of the Exhibition.

New Prize for Painters' Apprentices.—At a meeting of the executive officers of the Associations of Master Painters in England, Ireland, and Scotland, held in the Painters' and Stainers' Hall, London, it was resolved to establish an international travelling studentship, eligible to boys in the last year of their apprenticeship, and to be of the annual value of £50. The competition is to be for general knowledge of the trade, for excellence of executive workmanship in design and ornament, for a knowledge of historic ornament and architectural forms, and a definite scheme of design with working detail.

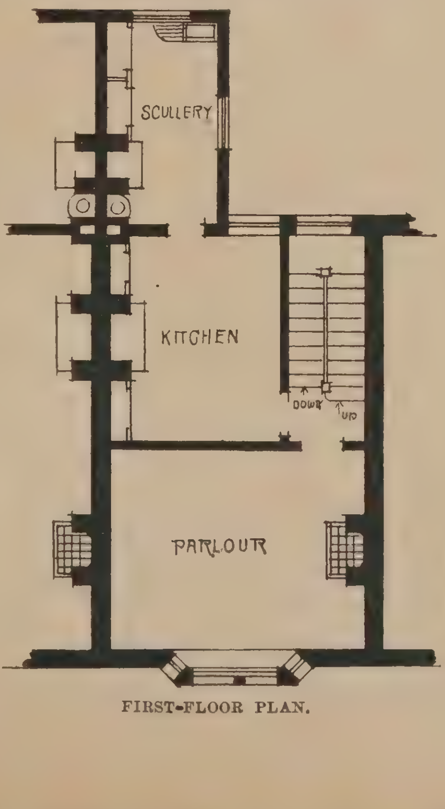


BUSINESS PREMISES IN COMMERCIAL ROAD, E. RUPERT C. AUSTIN, ARCHITECT.

MASTER BUILDERS' NATIONAL FEDERATION.

COMBINED ACTION TO DEAL WITH DISPUTES.

A QUARTERLY meeting of the Executive of the Midland centre of the National Federation of Building Trades' Employers was held on April 19th at the Birmingham offices. The President (Mr. A. Chambers, Leicester) occupied the chair. A long discussion took place in connection with notices given to or received from workmen in various branches of the trade at Burton-on-Trent, Coventry, Nuneaton, Newark, Dudley, Kidderminster, Sutton Coldfield, and other places, and it was pointed out that under the conditions generally observed in the trade these notices now expired at a period of the year when work, as a rule, was most plentiful, and consequently the employers, in order to carry out their contracts, were frequently compelled to make concessions that were unjust to themselves and extracted on unreasonable grounds.



FIRST-FLOOR PLAN.

The President remarked that, as a body, master builders had no desire to act arbitrarily as against their workmen, but from experience they were aware that many of the conditions the workmen's trade unions tried to enforce were detrimental to the best interests of the trade. Mr. J. Wright (Nottingham) said that one of the bugbears of the trade was what was known as the lines of demarcation laid down by the trade unionists. Master builders were for the most part practical men, and were fully competent to carry on their businesses, but in many cases they were not permitted to do so with anything like reasonable freedom. The question was one of great importance to the welfare of the building trade throughout the country, and it behoved the National Federation of Employers to take steps to prevent unjust and meddlesome interference with the masters' common rights. Several speakers took a similar view, and a resolution was passed affirming the necessity for more combined action throughout the kingdom in dealing with disputes in the trade which too frequently lead to strikes and lock-outs. Another point discussed was the desirability for a uniform contract form containing clauses applicable all over the country in relation to such matters as strikes, lock-outs, arbitration, and weather.

R.I.B.A.: Mr. Bond's Paper.—We regret we are obliged to hold over till next week our report of the paper by Mr. Francis Bond, M.A., on "The Classifications of Romanesque and Gothic Architecture," read before the Royal Institute of British Architects on Monday evening last.

Discovery of Ancient Ruins at Gosforth.—It was a tradition at Gosforth that there had been a chapel at what is known as Chapel Brow, a place about half way between Gosforth Hall and Wind Hall. The Archæological Society of Cumberland and Westmorland was induced to take the question up, and put the matter into the hands of their secretary (Mr. W. G. Collingwood, of Coniston). A few hands were set to work cutting trenches and excavating, which soon put the matter beyond doubt that a building of some sort had been on or near the site.

Keystones.

A Statue of the Emperor William I. of Germany has been erected on the Lange Brücke, Potsdam.

A New Roman Catholic Church at Enfield (accommodating 350 people) has been opened.

A new Congregational Church at Waring Green, Brighouse, is being erected to accommodate about 500 persons. The new chapel will cost £2,600, Messrs. Sharp and Waller are the architects.

A New Church House for Folkestone is being erected as a memorial to the late Canon Woodward. The site of the building is on the Bayle, near the parish church, and close to the sea.

The Bishop Otter Memorial College, Chichester, has been enlarged by the addition of a new wing, at a cost of nearly £4,000. The college now affords accommodation for eighty students.

The Archway in Ireland's Yard, Queen Victoria Street, which was unearthed last year, and which antiquaries decided was a portion of the Dominican Priory founded by Henry de Burgh in 1221, has been erected at Selsdon Park, Croydon, in the grounds of Mr. Wickham Noakes.

A State Inebriates' Home.—At a recent meeting of the Kent County Temperance Congress, at Dover, Mr. Joseph Malins said he had every reason to know that the Government proposed to erect a State Inebriates' Home. It was intimated that this institution would be built in East Kent.

At St. Thomas's Church, Bristol, the organ has been re-opened after the addition of a choir organ. The pitch has also been raised to concert pitch, pneumatic action arranged throughout, and the instrument is now blown by hydraulic power. The organ was built by Mr. George Johnson.

Fixing Electric Bells in Houses.—In the paper on this subject by Mr. H. E. Neale published on page 190 of our issue for April 10th, under the cross-heading "Electrical Units," the formula $R = \frac{C}{E}$ is in one case printed erroneously for $R = \frac{E}{C}$.

The Queen Victoria Memorial in Liverpool will have a very fine site between South Castle Street and Castle Street in the centre of the city. The spot was occupied up to a few years ago by St. George's Church, which was built with the stones of Derby Castle, which stood ere that on the same site.

In the Parish Church of Dormington Wood, Salop, the east window has recently been filled with stained glass. The window, which is a large one, has for its subject "The Cruxifixion," which is placed under canopies. In the base are figures of Saints Matthew, Aidan and Chad, while the inscription is to the memory of the late vicar. The window is the work of Mr. T. W. Camm, of The Studio, Smethwick.

A Parish Chapel at Wadhurst Hall, the residence of Mr. Julius C. Drew, was dedicated recently. The enlargement and decoration of the chapel have occupied a period of more than twelve months. The organ was built by the Positive Organ Company, and the building is lighted by the electric light. The work has been carried out by Mr. C. Startin, of Ticehurst, under the superintendence of Messrs. H. and E. Cronk, of Tunbridge Wells.

A Novel Victorian Memorial.—In commemoration of the sixtieth year of Queen Victoria's reign a large carved oak chest, or "press," has recently been presented to the parish church of Frenchay, which is practically a suburb of Bristol: The press is intended for the safe keeping of the different altar frontals, the colours of which indicate the varying seasons of the Church year, and is 7ft. 6in. in length by 4ft. in height. It has carved panels filled in with foliage and designs. An interesting feature in connection with the memorial is that it has been executed by the local Hambrook carving class, under the superintendence of two ladies. Formerly every good-sized church had its vestment press, alms-chest, and other receptacles, and the rude, quaint carving which characterises some of the old examples which have been preserved shows that they were often the product of local handicraft.

A New Art Gallery in Prague is to be erected for painting, sculpture, and architecture for the benefit of both races in Bohemia.

Messrs. E. H. Shorland & Brother, of Manchester, have just supplied their patent Manchester grates and ventilators to the Baptist Chapel, Leighton Buzzard.

A Baptist Chapel at Horsell is being erected for the Anthony's Mission Chapel congregation, midway between Woking and Ottershaw. It is to be in red and white brick. A class-room, a kitchen and a lavatory are attached to the main structure. The site is 90ft. deep, with 36ft. frontage, and the building is placed in a way that will admit of its being easily enlarged to double its present capacity, when the growth of the neighbourhood demands it. Mr. F. J. Bridger is the architect.

A Baptist "Church House" is to be erected in the new main thoroughfare between Holborn and the Strand. A part of the site was formerly occupied by the Kingsgate Baptist Chapel, which has just been demolished, and the remainder has been granted by the London County Council as compensation. The new building will become the headquarters of the Baptist Union of Great Britain and Ireland, now domiciled at the Mission House, in Furnival Street.

A New Primitive Methodist Church at Swindon has been recently opened in Rodbourne Road, providing accommodation for 400 persons, and new classrooms erected, the old chapel being utilised for a schoolroom. The building, which is Gothic in style, has been built with red pressed bricks for face, and Bathstone dressings, and covered with blue slates. There is a large oriel window in the front gable. The interior is seated in pitch pine, and the rostrum and the roof principals are also of this material. The windows are fitted with stained glass. Mr. R. J. Leighfield, of Swindon, was the builder, the contract being £1,151 10s.; and the architects were Messrs. William Drew (M.S.A.) & Sons, of Swindon.

Rebuilding in Lambeth.—The Ecclesiastical Commissioners have submitted to Lambeth Borough Council preliminary plans for the rebuilding of the Lambeth estate, which area is bounded on the north by the New Cut, on the east by Short Street, on the south by Ufford Street, and on the west by Webber Street. The scheme includes the closing of two streets in the area, the construction of a new road, and the giving up of half an acre for a recreation ground. There are 213 houses to be demolished, displacing 277 families, 91 lodgers, or, altogether, 630 persons, exclusive of children. The proposal is to rebuild tenement houses and cottages for the accommodation of 250 tenants.

Gladstone Memorial Chapel.—A memorial to the late Mr. and Mrs. W. E. Gladstone is to be erected in Hawarden parish church. It is proposed to remove the organ from the north side of the chancel, and to enlarge the organ chamber so as to form a chapel, in which will be placed a recumbent effigy representing Mr. and Mrs. Gladstone. It is probable that the chapel will be octagonal in form, with a groined roof and a stained glass window. Sir William Richmond is to be entrusted with the work, and the whole scheme is estimated to cost about £1,500. It will be necessary to apply for a faculty in the Consistory Court of Chester to authorise the erection.

Birmingham University Buildings.—The statement that in the opinion of the University Council the principle of selecting designs by competition could not be advantageously adopted in the case of the new University building has raised considerable feeling among some of the subscribers to the funds of the University, as well as the architects of Birmingham, inasmuch as it will entirely exclude the latter from the opportunity of testing their ability to produce a suitable design for the proposed buildings. It has, therefore, been decided to request the Chancellor of the University (Mr. Joseph Chamberlain) to receive a deputation of architects and subscribers, who will place before him reasons why he should use his influence to have the question reconsidered, in the hope that, by means of a carefully conducted competition, the best available architectural talent may be brought to the front. A requisition to Mr. Chamberlain asking him to receive such a deputation is in course of preparation.

HUDDERSFIELD THEATRE.

THE Huddersfield Theatre Royal and Opera House has recently undergone extensive alterations and improvements, re-seating, and decorating, at a cost of between £5,000 and £6,000. The carpeting of the stairs has been continued throughout the dress circle and private boxes. This carpet is in shades to match the peacock blue plush seating of the chairs (about 140 in number, and thirty-two in the private boxes), the curtains of the private boxes, and the upholstery of the ledge round the front of the dress circle. The drop scene has been painted with an Italian view and a pink and gold acanthus-leaf moulding carried round the proscenium. There are a portrait of Shakespeare and symbolic pictures of the drama, music, and comedy over the proscenium and the upper-circle private boxes. The colour scheme is of rose pink and gold in its setting of peacock blue. The promenade behind the dress circle seats at the back has reduced the seating accommodation; but it opens up means of easy egress and opportunities for moving about. The upper circle has been re-seated in peacock blue upholstery for over 200 persons. The gallery will accommoate over 600 persons. In the pit there are three rows of orchestra stalls for about seventy persons and four rows of pit stalls for over another hundred, with upholstered chairs in the former department, and armed division benches in the latter, again in peacock blue plush. New backed benches, taking up less room, allowing of a larger number, have been provided in the pit, so that over 400 can be easily seated there. Thus sitting accommodation is provided for between 1,500 and 1,600 persons, and there is ample cloak room, lavatory, and refreshment accommodation provided.

New Companies.

Dwellings Co-operative Company, Ltd.

Registered April 2nd to acquire, lay out, prepare for building purposes, and deal with any lands and property, and to carry on the business of builders, contractors, decorators, agents, &c. Capital £5,000 in £1 shares.

Landers, Ltd.

Registered April 6th (capital £5,000 in £1 shares) to carry on the business of manufacturers of and dealers in apparatus and materials for heating, lighting, ventilating, and purifying houses, buildings, &c. Registered office: 214, Vauxhall Bridge Road, S.W.

Fitton's Brick and Tile Co., Ltd.

Registered April 4th (capital £4,000 in £5 shares, 400 preference) to acquire the business carried on at Dewsbury and Ossett, Yorkshire, by J. Fitton, sen., and to carry on the business of brick, tile and pipe makers, pottery, earthenware and porcelain manufacturers and dealers, &c.

British Incandescent Heating Syndicate, Ltd.

Registered April 1st to adopt an agreement with A Smallwood and the Coventry Tube and Metal Company, Ltd., and to acquire, develop, and turn to account any invention relating to the manufacture of furnaces, muffles, and heating apparatus. Capital £35,000 in £1 shares.

H. C. L. Gas Stove, Ltd.

Registered March 28th to acquire a certain invention, and to carry on the business of manufacturers of and dealers in stoves, ranges, lamps, and other cooking, lighting or ventilating apparatus, &c. Capital £40,000 in £1 shares. Registered office: 8, Berners Street, W.

Builders' and General Foundry Company, Ltd.

Registered March 29th to acquire the business carried on at 22, Cemetery Road, Sheffield, by H. Platten, and to carry on the business of ironfounders, manufacturers of tomb railings, ornamental railings, fencing, palisading, altar rails, balusters, &c. Capital £3,000 in 200 ten per cent. cumulative preference shares of £5 each and 2,000 ordinary shares of £1 each. The first directors are S. A. Ward, H. Platten and J. L. Taaffe. Registered office: Victoria Chambers, 22, Norfolk Row, Sheffield.

Plowman & Son, Ltd.

Registered March 27th to take over the business of a brick, pipe and tile manufacturer and merchant carried on by T. S. E. Plowman at Meppershall and Gravenhurst, Bedfordshire, as E. Plowman. Capital £7,500 in £5 shares. The first directors are T. S. E. Plowman (governing director) and J. A. Plowman. Registered office · Stanpit, Shefford, Bedfordshire.

Coxhoe Limestone Company, Ltd.

Registered March 28th to acquire certain freehold estates in the county of Durham, and to carry on the business of lime burners, quarrymen, cement manufacturers, builders, contractors, limestone, lime, clay and stone merchants, &c. Capital £4,000 in £1 shares. The first directors are F. J. Bell, T. Common, L. S. H. C. Orde and H. S. Peel. Registered office: 1, St. Nicholas Buildings, Newcastle-on-Tyne.

National Association of Master House Painters and Decorators of England and Wales (Incorporated).

Registered March 27th, with 1,000 members, each liable for £1, to take over the unincorporated National Association of Master House Painters (established at Manchester in 1894), and, generally, to promote the interests of master house painters and decorators. The management is vested in a committee. Registered office: 16, Oxford Street, Chorlton-on-Medlock, Manchester.

COMING EVENTS.

Wednesday, April 24.

GEOLOGICAL SOCIETY OF LONDON. — Meeting at 8 p.m.

SOCIETY OF ARCHITECTS.—Annual Dinner at the Prince's Restaurant at 6.30 p.m.

SOCIETY OF ARTS.—Mr. Alexander Siemens on "Patent Law Reform," 8 p.m.

EDINBURGH ARCHITECTURAL SOCIETY.—Address by Mr. Harold O. Tarbolton, the Hon. President, and Award of Prizes in competitions.

INSTITUTE OF SANITARY ENGINEERS.—Visit to Building Trades Exhibition.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the Shipbuilding Department of the Thames Iron Works, Shipbuilding and Engineering Co., Ltd., at Works, Orchard Yard, Blackwall, E., at 2.25 p.m.

Thursday, April 25.

SOCIETY OF ARCHITECTS.—Mr. Ellis Marsland on "The Results of some Tests with Fire-resisting Materials," 8 p.m. Visit during day to Building Trades Exhibition.

ROYAL INSTITUTION.—Mr. Roger Fry on "Naturalism in Italian Painting"—II., 3 p.m.

INSTITUTION OF CIVIL ENGINEERS (Ninth "James Forrest" Lecture).—Prof. Frank Clowes, D.Sc., on "Chemistry in its relations to Engineering," 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Meeting at 8 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Dr. Todhunter on "Some Pictures in the National Collection."

Friday, April 26.

ARCHITECTURAL ASSOCIATION.—Members' Soirée.

ROYAL INSTITUTION. — Dr. Hans Gordon on "Colour in the Amphibia," 9 p.m.

SOCIETY OF ARTS (Howard Lectures).—Mr. Alfred C. Eborall, M.I.E.E., on "Polyphase Electric Working," 8 p.m.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Business meeting at 8 p.m.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

BUILDING TRADES' EXHIBITION, Royal Agricultural Hall, Islington.—Conference on Standardising of Bricks, 4 p.m.

Saturday, April 27.

ROYAL INSTITUTION.—Mr. John Young Buchanan on "Climate: Its Causes and Its Effects"—II., 3 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Sunderland.

Monday, April 29.

SOCIETY OF ARTS (Cantor Lectures).—Sir William Chandler Roberts-Austen, K.C.B., F.R.S., and Mr. T. Kirke Rose, D.Sc., on "Alloys"—II.

TOWN HALL, ISLINGTON.—Conference of the Housing of the Working Classes.

SURVEYOR'S INSTITUTION.—Ordinary General Meeting, 8 p.m.

Wednesday, May 1.

SOCIETY OF ARTS.—Mr. Arnold F. Hills on the "Thames Steamboat Service," 8 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Annual General Meeting. 4.30 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual Business Meeting and Presidential Valedictory. Addressed by Mr. Henry F. Kerr, A.R.I.B.A.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ACTON.—For carrying out certain work of York flagging and tar paving on the main road footpaths in the district of Acton, for the Highways Committee of the Middlesex County Council, Mr. H. T. Wakelam, county engineer and surveyor:—

J. Smart	£2,265	B. Nowell & Co.	£2,136
W. Griffiths & Co., Limited	2,182	H. Morecroft	2,090
W. Neave & Son	2,160	G. Wimpey & Co.*	2,025

* Accepted.

BOURNEMOUTH.—For works, &c. in connection with the Corporation tramways. Mr. F. W. Lacey, M.I.C.E., borough engineer, and Messrs. Lacey, Clirehugh & Sillar, consulting engineers, 2 Queen Anne's Gate, S.W.:—

Contract No. 1.—38 electric cars, &c.

Bramigh & Co.	£35,025	0
Siemens Bros. & Co., Limited	30,970	0
R. Blackwell & Co.	30,374	0
Hungarian Railway Carriage and Machine Company	30,030	0
Hurst, Nelson & Co.	29,472	4
British Thomson-Houston Company	29,364	2
Brush Electrical Engineering Company, Limited	28,381	0
British Westinghouse Electric and Manufacturing Company, Limited*	28,020	0

* Accepted.

BOURNEMOUTH.—For works, &c. in connection with the Corporation tramways. Mr. F. W. Lacey, M.I.C.E., borough engineer, and Messrs. Lacey, Clirehugh & Sillar, consulting engineers, 2 Queen Anne's Gate, S.W.:—

Contract No. 2.—Four steam dynamos, &c.

Brush Electric Engineering Company, Limited	£18,930
British Westinghouse Electric and Manufacturing Company, Limited	17,857
British Schuckert Electric Traction Company	17,453
Brush Electric Engineering Company	17,250
British Westinghouse Company	16,234
British Schuckert Company	16,145
Johnson-Lundell Electric Traction Company	16,135
Anchor Electric Company	15,900
British Schuckert Electric Traction Company	15,485
Lancashire Dynamo and Motor Company, Limited	15,406
Anchor Electric Company	15,200
Anchor Electric Company	15,100
Siemens Bros. & Co., Limited	14,890
Lancashire Dynamo and Motor Company	14,844
British Thomson-Houston Company, Limited*	14,733
Johnson-Lundell Electric Traction Company	14,283
Bow, McLachlan & Co.	14,000
British Thomson-Houston Company	13,993
C. A. Parsons & Co.	13,418
C. A. Parsons & Co.	12,531
British Thomson-Houston Company	12,321
C. A. Parsons & Co.	12,239
Siemens Bros. & Co.	12,199
Lancashire Dynamo and Motor Company	11,982
British Westinghouse Company	11,932

* Accepted.

BRADWELL (BUCKS).—For the erection of a new girls' school and alterations to existing buildings, for the Bradwell School Board. Mr. John Chadwick, architect, Bletchley:—

T. Jerrell, Linsdale	£3,989	10	0
Cook & Son, Leighton Buzzard	3,940	0	0
Kemp & Son, Stantonbury	3,484	16	9
T. H. Coleman, Bedford	3,432	0	0
Tranfield,* Stantonbury	3,198	15	0

* Accepted subject to approval of Education Department.

BRIGHTON.—For the erection and completion of a motor room and offices, Bread Street, Brighton, in connection with the Corporation electricity works adjoining. Mr. Francis J. C. May, M.I.C.E. F.S.I., borough engineer:—

If room lined with crystopal.

C. Jackson, 57 King Street	£1,920
Martin, Wells, & Co., Vauxhall, London, S.E.	1,903
J. Longley & Co., Crawley	1,821
J. G. Pickard, Turner's Hill	1,821
R. Cooke & Sons, Crawley	1,782
Rowland Bros., Horsham	1,679
Hallett & Duke, George Street	1,650
Saunders Bros., Grand Parade	1,519
Sattin & Evershed, Freshfield Road	1,494
W. A. Field & Co., Preston Street	1,450

If room lined with glazed bricks.

J. Longley & Co.	£2,081	0	Rowland Bros.	£1,699	0
C. Jackson	2,010	0	Saunders Bros.	1,641	0
R. Cooke & Sons	1,812	0	Hallett & Duke	1,612	16
J. G. Pickard	1,706	4	W. A. Field & Co.	1,540	0
Sattin & Evershed	1,670	0			

If room lined with trowelled cement.

C. Jackson	£1,670	0	Hallett & Duke	£1,398	10
J. Longley & Co.	1,586	0	Saunders Bros.	1,305	0
J. G. Pickard	1,580	0	W. A. Field & Co.	1,255	0
R. Cooke & Sons	1,512	0	Sattin & Evershed*	1,250	0
Rowland Bros.	1,450	0			

[Rest of Brighton.]

* Accepted.

BRYMBO (WREXHAM).—For the erection of a new schoolroom and other works at Vron Schools, for the Brymbo School Board. Messrs. Davies and Moss, architects, 2 Temple Row, Wrexham:—

W. E. Samuels, Wrexham	£2,100	0	0
S. Moss, Coedpoeth	2,051	18	8
J. T. Jones, Cefn	1,895	0	0
W. Wycherly & Co., Pentre Broughton	1,800	0	0
R. Roberts, Coedpoeth	1,785	0	0
R. Williams, Brymbo	1,750	0	0
T. Williams,* Southsea	1,549	17	0

* Accepted.

CIRENCESTER. — Accepted for rebuilding the "Plume of Feathers" Inn, Watermoor Road, for Messrs. T. & J. Arkell, Kingsdown Brewery. Messrs. William Drew, M.S.A., & Son, architects, Regent Circus, Swindon. Quantities by the architects:—

G. F. & E. Newcombe, Cirencester ... £1,391

[Five tenders received.]

COLESHILL (BIRMINGHAM).—For the erection of seven cottages, Coventry Road, Coleshill, for the Committee of the Coleshill Oddfellows:—

W. Coton, jun., Bowyer Road, Saltley, Birmingham	£1 765	6
A. Heape, 146 Nechells Park Road, Birmingham	1,720	0
H. Cliff, Coleshill	1,670	0
J. Barker,* Coleshill	,470	0
G. Isherwood, Coleshill	1,577	0
W. Gibbs, Lea Marston, Minworth, Birmingham	1,575	0
A. Green & Co., 29 Easy Row, Birmingham	1,329	0

* Accepted.

COLNE (LANCS.)—For the erection of electric lighting station, &c., Phillip's Lane, for the Corporation. Mr. T. H. Hartley, Town Hall, Colne, borough surveyor. Quantities by borough surveyor:—

Masonry, &c.

J. & D. Lancaster	£3,172	9	10	W. Townson	£2,428	7	0
Bottomly & Co.	2,601	19	6	J. Hawley,* Colne	3,363	9	[illegible]
P. Robinson	2,445	9	5				

Carpentery and joinery.

Latham & Rushton	£389	5	6	J. Roberts	£374	0	0
Caddie Bros.	386	3	7	Horsfeld & Jackson,* Colne	351	9	9
J. Wiseman	380	0	0				
Ruddrough & Co.	378	0	0				

* Accepted.

DORCHESTER.—For constructing high and low level main intercepting sewers, including manholes, flushing chambers, ventilators, pumping station, rising main, and all incidental works in connection therewith comprised in Contract No. 1, for the Dorchester Town Council. Mr. G. J. Hunt, borough engineer and surveyor:—

Pedrette & Co., Finsbury Park	£12,081	9	10
W. Underwood & Bro., Dukinfield	10,417	18	6
S. Saunders, Earl's Court	10,363	18	0
W. Jones & Son, Neath	10,259	0	0
F. Bowering, Weymouth	10,121	3	6
G. Osenton, Westerham	9,140	0	0
J. & T. Binns, Croydon	9,1[illegible]4	0	0
G. Bell, Tottenham	8,968	0	0
J. T. Whettam, jun., Weymouth	8,506	0	4
B. Cooke & Co.,* Westminster	8,215	0	0

* Accepted.

DORCHESTER.—For constructing screening chambers, tanks, filter-beds, channels, stores, &c., and all incidental works in connection therewith comprised in Contract No. 2, for the Dorchester Town Council. Mr. G. J. Hunt, borough engineer and surveyor:—

Pedrette & Co., Finsbury Park	£8,867	18	4
S. Saunders, Earl's Court	8,512	6	6
G. Osenton, Westerham	8,484	15	5
J. & T. Binns, Croydon	7,386	7	1
W. Jones & Son, Neath	7,251	0	0
J. T. Whettam, jun., Weymouth	7,071	12	7
W. Underwood & Bro., Dukinfield	6,903	15	0
G. Bell, Tottenham	6,534	0	0
B. Cooke & Co.,* Westminster	6,520	5	8

* Accepted.

GEDDINGTON, near KETTERING.—For the erection of new club premises for the Working Men's Club & Institute, Geddington, near Kettering. Messrs. Mosley & Scrivener, architects, Fish Street, Northampton:—

C. Andrew, Kettering	£650	18
Johnson & Phillips, Kettering	621	5
Gray Bros., Northampton	618	0
Howard & Lewis, Kettering	600	0
T. & C. Berrill, Irchester	599	0
A. Lewis, Isham	596	10
A. G. Godwin, Northampton	595	7
Smith, Edmunds & Co., Kettering	575	0
H. Judkins, Kettering	557	0
E. Patrick, Geddington	556	0
Wilford & Judkin, Northampton	550	0
Smith & Bunning, Kettering	524	15
J. Patrick,* Geddington	496	0

* Accepted.

GUILDFORD.—For the removal of the old town bridge, and the construction on its site of a steel arch bridge, with necessary stone and concrete abutments, retaining walls, approaches, &c. for the Corporation:—

Higlett & Hammonds, Guildford	£6,897	0	0
J. B. Squire & Co., London	6,672	0	0
G. A. Franks, Railway Approach, Guildford	6,410	0	0
C. Wall, Chelsea	6,200	0	0
A. Thorne, 7, Carteret Street, Westminster	6,191	9	6
E. D. & J. Keay, Limited, James Bridge Works, Birmingham	6,167	10	0
Heenan & Froude, Newton Heath Ironworks, Manchester	6,165	0	0
A. & A. Streeter, Meadrow, Godalming	5,892	0	0
S. Kavanagh, Surbiton Hill	5,881	14	0
A. Fasey & Sons,* Leytonstone	5,596	9	0

* Accepted.

HIGHWORTH (WILTS).—Accepted for the erection of new club room and alterations to the "Saracen's Head" Hotel, for Messrs. T. & J. Arkell, of Kingsdown Brewery. Messrs. William Drew, M.S.A., & Sons, architects, Regent Circus, Swindon:—

A. J. Colborne, Swindon ... £674 10 6

[Four tenders received.]

HIGH WYCOMBE.—For the erection of pair of houses, for Messrs. Birch and Gibbs, Amersham Hill, Mr. Arthur Vernon, 29 Cockspur Street, London, S.W., and High Wycombe, architect:—

Harris	£1,944	0	0	Gibson	£1,625	0	0
Furniss	1,850	12	6	Lee	1,475	4	0
Nash	1,693	0	0	Hunt*	1,317	0	0
Flint	1,667	0	0				

* Accepted.

HOOLEY HILL.—For the erection of a New Wesleyan School Messrs. J. H. Burton & J. A. Percival, architects, 150A Stamford Street, Ashton-under-Lyne:—

J. J. Blackburn, Manchester	£3,970
T. Taylor & Sons, Audenshaw	3,583
A. Haughton & Sons, Godley	3,348
Joseph Clayton, Denton	3,260
F. Woolley, Ashton-under-Lyne	3,150
John Clayton & Sons, Denton	3,131
A. Bridge, Manchester	3,100
J. W. Williamson, Ashton-under-Lyne	2,980
Saxon Bros., Stalybridge	2,955
W. H. Hurst, Audenshaw	2,940
Shuttleworth Bros., Stalybridge	2,900
Edwin Marshall, Ashton-under-Lyne	2,849
Thomas Dean, Hurst Brook	2,870
Fitton & Bowness, Ashton-under-Lyne	2,817
S. Robinson & Sons, Hyde	2,780
J. Ridyard, Ashton-under-Lyne	2,780
Garside, Barnes & Co., Stalybridge	2,775
Albert Bennett, Dukinfield	2,742
J. Gibson & Sons, Dukinfield	2,730
J. Robinson, Ashton-under-Lyne	2,685
Z. Pike & Son, Hooley Hill	2,600
James Thornley,* Hooley Hill	2,500

* Accepted.

HOUNSLOW.—For certain alterations and additions to the polytechnic for the Technical Committee of the Middlesex County Council. Mr. H. T. Wakelam, county engineer and surveyor:—

C. C. Heath, Chiswick	£2,300
Patman & Fotheringham	2,054
W. Slark, Twickenham	2,050
W. J. Renshaw, Putney	1,851
G. Challis,* Brentford	1,850

* Accepted.

LONDON.—For the erection of a building in Bushy Park for the National Physical Laboratory, for the Commissioners of H.M. Works and Public Buildings:—

B. E. Nightingale	£3,777	C. Towner	£3,360
J. W. Brooking	3,668	Speechley & Smith	3,241
Spiers & Son	3,650	C. G. Hill	3,160
Maple & Co., Limited	3,642	J. Dorey & Co.	3,139
Lole & Lightfoot	3,590	W. J. Renshaw	3,133
Foster Bros.	3,577	Campbell, Smith & Co., Limited*	2,966
R. Myall	3,468	H. Kent	2,650
T. J. W. Jessom & Sons	3,371		

* Accepted.

NORWICH.—For erection of Scott Memorial Church, Thorpe Road, for the Trustees. Mr. A. F. Scott, F.S.I., architect:—

S. H. Blyth	£4,998	17	6	J. Evans	£4,250	0	0
Daws & Son	4,489	0	0	T. Gill	4,249	0	0
J. W. Collins	4,450	0	0	Scarles Bros.,* Norwich	3,974	0	0
J. S. Smith	4,393	0	0	(Architect's estimate £3,906.)			
G. E. Hawes	4,268	0	0				

* Accepted.

READING.—For the erection of proposed Caversham Road, new Presbyterian Church, Reading. Mr. Lewton, architect, 6 Forbury, Reading:—

Stokes	£4,460	Bottrill & Son	£3,987
Dixon	4,300	Godwin	3,948
Margetts	4,139	Curtis*	3,545

* Accepted.

TONBRIDGE (KENT).—For making alterations and additions to the Barden Road Schools, and for building new department for infants:—

Crates & Son, Grosvenor Road, Tunbridge Wells	£1,363	0
Jarvis, Judd Road, Tonbridge	1,295	0
C. Day, Gilridge, Cowden, Kent	1,246	0
Ottewill & Son, St. Peter's Street, Maidstone	1,193	0
Warren, Hadlow, Kent	1,112	0
Punnett & Son, St. Margaret's, Tonbridge	1,102	17
Martin & Co.,* Preston Road, Tonbridge	1,075	0

* Accepted.

SOUTHALL.—For laying down certain Californian red gum wood paving on the main road for the Highways Committee of the Middlesex County Council. Mr. H. T. Wakelam, county engineer and surveyor :—

Acme Wood Flooring Company	£2,546	0	9
J. Macklin	2,369	0	0
Improved Wood Paving Company	2,347	0	3
G. Wimpey & Co.	2,255	0	0
H. Boyer	2,195	0	0
W. Griffiths & Co.	1,979	17	6
E. Alcott*	1,979	17	6

* Accepted.

WAYBOURNE-ON-SEA (NORFOLK).—For the erection of the Waybourne Springs Hotel, Waybourne-on-Sea, Norfolk. Mr. R. W. W. Carter, A.M.I.C.E., architect, Cromer and Sheringham :—

Chapman, Hanworth	£6,700	0
F. Thoday & Co., Cambridge	£6,460	0
Smith, Norwich	6,447	0
Towler, Edgfield	6,083	0
Banyard, Cambridge	6,070	0
Hawes, Norwich	5,900	0
Riches, Cromer	5,890	0
Scarles, Norwich	5,787	0
Hipwell & Co., Wisbech	5,767½	0
Rands, Wisbech	5,739	10
Chapman, Norwich	5,694	0
Lines, Runton	5,579	0
Porter, Cromer	5,554	0
Collins, Downham Market	5,500	0
Shanks, Cambridge	5,440	0
Neale,* Baconsthorpe	5,333	0

* Accepted.

Institute of Sanitary Engineers.—The election committee on the 10th electedthe following : Mr. S. L. Bartholomew, Clapham ; Mr. C. E. S. Crawcour, Bray, Ireland ; and Mr. J. Moore, Whitley.

The Northern Architectural Association has just forwarded us its annual report. This states that the Association has had increasing success during the past session, and the number of members, associates and students are now respectively 54, 71 and 61—total 186. The balance to the credit of the Association is £89 4s. 6d.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
April	26	New Clee—Schools	Great Grimsby School Board	H. C. Scaping, Architect, County Chambers, Grimsby.
,,	26	Great Grimsby—Schools	School Board	H. C. Scaping, Court Chambers, Grimsby.
,,	26	Aberdeen—Church	——	A. M. Mackensie, 343 Union Street, Aberdeen.
,,	26	Belfast—Warehouse, &c.	J. Fulton & Co., Ltd.	W. H. Stephens & Sons, Belfast.
,,	26	Halifax—Houses, &c.	——	L. Coates, Architect, Yorks, Bank Chbrs., Waterhouse St., Halifax
,,	26	Halifax—Walling, &c.	Corporation	J. Lord, Borough Engineer, Town Hall, Halifax.
,,	26	High Bentham, nr. Lancaster—Chancel, &c.	——	Wright & Son, Surveyors, Lancaster.
,,	26	Stockton-on-Tees—Schools	School Board	E. A. Whipham, 59 High Street, Stockton.
,,	26	Bletchingley—Diphtheria Ward	Rural District Council	Mariner, The Lodge, Isolation Hospital, Bletchingley.
,,	27	Myrtlefield Park—Villa	——	Blackwood & Jury, 41 Donegall Place, Myrtlefield Park.
,,	27	Perranporth—Alterations, &c.	J. Roberts	J. Roberts, Perranporth.
,,	27	Ramsgate—Shedding Offices	East Kent Agricultural Society	P. M. Collard, Secretary, Canterbury.
,,	27	Wrotham—12 Workmen's Dwellings	Urban District Council	J. Sharp, 5 Sunnyside, Borough Green, Wrotham.
,,	27	Aberaman—Houses	Glyndwr Building Club	T. Roderick, Clifton Street, Aberdeen.
,,	27	Morley, Yorks—House, &c.	General Purposes Committee	W. E. Putman, Town Hall, Morley.
,,	27	Penzance—Farmhouse	J. Lawry, Heamoor, Penzance	H. Maddern, 26, Clarence Street, Penzance.
,,	27	Rhymney, Wales—Houses	No. 1 Building Club	T. Roderick, Architect, Clifton Street, Aberdare.
,,	27	Stair, nr. Braithwaite, Keswick—Rebuilding Bridge	Cockermouth Rural District Council	W. B. Wilson, Court Buildings, Cockermouth.
,,	27	Warrington—Offices, &c.	Guardians	W. & S. Owen, Architects, Warrington.
,,	27	Whitley, Yorks—Schools	——	C. Hall & Dalby, Prudential Buildings, Park Row, Leeds.
,,	29	Salterhebble, Yorks.—Houses	——	J. F. Walsh & G. Nicholas, Lancs. and Yorks. Bank Chbrs., Halifax.
,,	29	Halifax—Chapel, &c.	——	R. Horsfall & Son, 22A, Commercial Street, Halifax.
,,	29	Glasgow—Station Buildings	Caledonian Railway Company	Company's Engineer, Buchanan Street Station, Glasgow.
,,	29	Edinburgh—Wood Finishing	Corporation's Gas Commissioners	W. R. Herring, New Street Works, Edinburgh.
,,	29	Aberdeen—Shed	Harbour Commissioners	R. G. Nicol, Harbour Engineer's Office, Aberdeen.
,,	29	Grimsby—Converting, &c.	——	H. G. Wyatt, Borough Engineer & Surveyor, Town Hall Sq., Grimsby.
,,	29	Tipperary—Soldiers' Home	——	W. H. Hill & Son, 28 South Mall, Cork.
,,	30	Aberavon—Esplanade	——	B. Brunfill, 26 London Road, Neath.
,,	30	Swadlincote—Retort House	Water & Lighting Committee	T. Kidd, Surveyor's Office, Coppice Side, Swadlincote.
,,	30	Sunderland—Villas, &c.	County Borough Asylum at Ryhope	Borough Surveyor's Office, Town Hall, Sunderland.
,,	30	London, S.W.—Foundations of Admiralty Buildings	Commissioners of H.M. Works, &c.	Sir J. Taylor, H.M. Office of Works, &c., Storey's Gate, S.W.
,,	30	Woolston, Hants—Alterations	United District School Board	W. H. Mitchel, Son, & Gutteridge, 9 Portland Street, Southampton.
,,	30	Hinckley—Post Office	Commissioners of H.M. Works, &c.	H.M. Office of Works, &c., Storey's Gate, S.W.
,,	30	Malvern—Trucks	Urban District Council	H. P. Maybury, Gas Department, Malvern.
,,	30	Annfield Plain, Durham—Public Offices	Urban District Council	T. J. Trowsdale, Surveyor, Annfield.
,,	30	Devonport—Purifying House	Gas & Coke Co.	Gaswork's Offices, Keyham, Devonport.
,,	30	Featherstone—Restoraton	——	W. H. Fearnley, Station Lane, Featherstone.
,,	30	Horley, Surrey—Home for Female Inebriates	General Branch Architects' Department	County Hall, Spring Gardens, S.W.
,,	30	Camberwell—Convenience	Public Health Committee	W. Oxtoby, Town Hall, Peckham Road.
May	1	Wolverhampton—Convenience	Public Works Committee	J. W. Bradley, Town Hall, Wolverhampton.
,,	2	Dublin—Repair of Vessel	Commissioners of Irish Lights	Irish Lights Office, Dublin.
,,	2	Halifax—Villas	——	M. Hall, 29 Northgate, Halifax.
,,	3	Goldhanger, near Maldon, Essex—Bridge	County Council	P. J. Sheldon, County Offices, Chelmsford.
,,	3	Newbold—Central Hall	School Board	W. Glossop, Cavendish Street, Chesterfield.
,,	4	Leicester—Roofing, &c.	Markets Committee	E. G. Mawbey, Town Hall, Leicester.
,,	4	Percy Main, near Newcastle-on-Tyne—Church	——	J. Grant, 48 Blyth Street, Percy Main.
,,	6	Fordingbridge, Wilts—Strengthening Bridge	County Council	W. J. Taylor, The Castle, Winchester.
,,	6	Shanklin—two Groynes, &c.	Urban District Council	Council Chambers, Victoria Avenue, Shanklin.
,,	6	Gelli, Rhondda Valley—Baptist Chapel	Building Committee	W. D. Morgan, 5 Baily Street, Ton, Pentre, R.S.O.
,,	6	Langarth, Truro—Farm House	——	S. Hill, Architect, Redruth.
,,	7	Oxford—Methodist Chapel	——	H. Winkworth, 3A Hatton Court, Ipswich.
,,	7	London, N.—Wall, &c.	Tottenham Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
,,	9	Hoylake, Cheshire—Lavatory Fittings	Urban District Council	T. Foster, District Council Offices, Hoylake.
,,	9	Ludlow—Buildings	Corporation	J. Parker, 14 Nelson Street, Hereford.
,,	9	Chelmsford, Essex—additions, &c.	Standing Joint Committee	F. Whitmore, Duke Street, Chelmsford.
,,	11	Lichfield—School	Governors	H. Smith, 111 Finsbury Pavement, London, E.C.
,,	13	East Grinstead—Workmen's Dwellings	Urban District Council	R. Wilds, Urban Council Offices, East Grinstead.
,,	14	Abingdon—School Buildings	School Board	F. Morland, 33 Bath Street, Abingdon.
		ENGINEERING:		
April	26	Brighton—Iron and Steel Work	Town Council	F. J. Tillstone, Town Hall, Brighton.
,,	26	Sunderland—Switchboard Panels, &c.	Corporation	J. F. C. Snell, Dunning Street, Sunderland.
,,	26	Chesterfield—Sewage Main	Rural District Council	Engineer to the Council, Union Offices, Chesterfield.
,,	27	Goole—Extension of Waterworks	Urban District Council	J. C. Mellis, 264 Gresham House, Old Broad Street, E.C.
,,	27	Cirencester—Water Supply Works	Rural District Council	F. Redman, 34 Wood Street, Swindon.
,,	27	Aberdeen—Boilers, &c.	Electric Lighting Committee	J. A. Bell, Cotton Street, Aberdeen.
,,	27	Middleton, Lancs.—Refuse Destructor	Corporation	Town Clerk, Middleton, Lancashire.
,,	27	Workington—Deepening, &c. Channel	——	J. Eden, 58 Pow Street, Workington.
,,	29	Motherwell, Scotland—Dynamos, &c.	Electric Light Committee	J. Burns, Town Clerk, Motherwell.
,,	29	Glasgow—Hoist	Trustees of the Clyde Navigation	G. H. Baxter, 16 Robertson Street, Glasgow.
,,	29	Partick, Scotland—Switchboard, &c.	Provost, Magistrates & Councillors	J. Donaldson, 97 West Regent Street, Glasgow.
,,	29	Hanley, Staffs.—Sewage Tank	——	J. Lobley, Borough Engineer & Surveyor, Town Hall, Hanley.
,,	30	Middlesborough—Plant	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, London, S.W.
,,	30	London, S.W.—Electric Pumps, &c.	Battersea Borough Council	Town Clerk, Municipal Buildings, Lavender Hill, S.W.
,,	30	Cardiff—Materials	Corporation	A. Mills, Old Post Office Buildings, Cardiff.
,,	30	London, S.W.—Campshedding	London County Council	Parks Department, 11 Regent Street, S.W.
,,	30	Alloa, Scotland—Cables, &c.	Electric Lighting Committee	Buchan & Hogarth, 36 Hanover Street, Edinburgh.
,,	30	Aberavon—Esplanade	——	B. Branfill, 26 London Road, Neath.
,,	30	Buxton—Lining Reservoir	Urban District Council	D. H. Grieves, Town Hall, Buxton.
,,	30	Portsmouth—Telephone Materials	Corporation	A. R. Bennett, 65 Renfield Street, Glasgow.
,,	30	Dublin—Engines, &c.	Commissioners of Public Works	Commissioners' Office, Dublin, Ireland.
,,	1	Blyth and Jesmond—Railway	North Eastern Railway Company	C. A. Harrison, Central Station, Newcastle-on-Tyne.
May	1	Ashford, Kent—Heating	Guardians of Union	H. Knock, Ashford.
,,	1	Chesterfield—Waterworks	Rural District Council	Union Offices, Chesterfield.
,,	1	Christiania—Water Tanks	Norwegian State Railways Administration	Director of Railways, Christiana.
,,	1	Clacton-on-Sea—Retort Bench	Urban District Council	S. Francis, Town Hall, Clacton-on-Sea.
,,	1	London, E.—Engineering Works	Guardians of Poplar Union	F. J. Warden-Stevens, 34 Victoria Street, Westminster.
,,	1	Salford—Footbridge	Corporation	C. S. Allott & Son, 46 Brown Street, Manchester.
,,	1	Workington—Bridges	Corporation	J. Bintley, 7 Lowther Street, Kendal.
,,	1	Blyth & Jesmond—Railway	North Eastern Railway Company	C. A. Harrison, Central Station, Newcastle-on-Tyne.
,,	3	High Wycombe—Railway	G.W. & G.C.R. Joint Committee	Engineer's Office (G.W.R.), Paddington Station.
,,	6	Shanklin, Isle of Wight—Groynes	Urban District Council	Council Chambers, Victoria Avenue, Shanklin.
,,	7	Huncoat, Near Accrington—Widening Railway, &c.	Lancs. & Yorks. Railway Company	Engineer's Office, Hunt's Bank, Manchester.
,,	7	Manchester—Plant, &c.	Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester.
,,	10	Madrid—Telephone System	Spanish Post Office	Commercial Department, Foreign Office, Madrid.
,,	14	London, S.W.—Wiring	Battersea Borough Council	W. M. Wilkins, Municipal Buildings, 1 Lavender Hill, S.W.
,,	24	Corunna—Tramway Concession	Spanish Ministry of Agriculture	Commercial Department, Foreign Office Corunna.
,,	25	Carlisle—Waterworks	Corporation	C. B. Newton, Engineer, Victoria Viaduct, Carlisle.
,,	30	Tonbridge, Kent—Plant	Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
June	3	Madrid—Tramways	Spanish Government	Commercial Department, Foreign Office, Madrid.
Dec.	10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL:		
April 27	Dundee—Iron, &c.	Town Council	P. Fisher, Tramway Office, Town House Buildings, Dundee.
„ 30	Barnsley—Pipes	Corporation	T. & C. Hawksley, 30 Great George Street, Westminster, S.W.
„ 30	Sheffield—Iron & Steel Works	United Gaslight Company	J. W. Morrison, Company's Offices, Sheffield.
May 7	Bradford—Iron Castings, &c.	Cleansing Committee	McTaggart, Hommerton Street Depôt, Bradford.
„ 10	Shrewsbury—Girders	Joint Com. of L. & N.W. & G.W.R. Co.'s	Joint Engineer, Woodside Station, Birkenhead.
July 1	Calcutta—Bins	Corporation	Chairman of Corporation, Calcutta.
	PAINTING AND PLUMBING:		
April 27	Dundee—Oils, &c	Town Council	P. Fisher, Tramway Office, Town House Buildings, Dundee.
May 2	Uxbridge—Oil	Rural District Council	J. F. Stow, Corn Exchange, Uxbridge.
„ 7	Bradford—Oils, &c.	Cleansing Committee	McTaggart, Hammerton Street Depôt, Bradford.
Aug. 5	Cleckheaton—Interior Renovation of Church	——	Wesleyan Church, Whitcliffe Road, Cleckheaton.
	ROADS AND CARTAGE:		
April 26	Coleford—Road Works	——	Crown Offices, Whitemead Park, Coleford.
„ 27	East Dereham—Granite	Urban District Council	H. G. Himson, Theatre Street, East Dereham.
„ 27	Maldon, Essex—Road Repairs, &c.	Rural District Council	H. G. Keywood, Public Hall Chambers, Maldon.
„ 27	Swinton, near Manchester—Materials	Urban District Council	H. Entwisle, Council Offices, Swinton.
„ 27	Whitley, Northumberland—Street Works	Urban District Council	J. P. Spencer, 30 Howard Street, N. Shields.
„ 29	Uckfield, Sussex—Materials	Urban District Council	Council Offices, Uckfield.
„ 29	Romford—Granite, &c.	Rural District Council	G. Lapwood, North Street, Romford.
„ 29	Hastings—Granite Kerbing	Corporation	P. H. Palmer, Town Hall, Hastings.
„ 29	Edinburgh—Waggons	Corporations Gas Commissioners	W. R. Herring, New Street Works, Edinburgh.
„ 30	Rochdale—Paving, &c.	Paving, &c. Committee	S. S. Platt, Town Hall, Rochdale.
May 1	Litherland, Lancs.—Passages	Urban District Council	W. B. Garton, 25, Sefton Road, Litherland.
„ 1	Desborough, Northants—Granite and Slag	Urban District Council	Surveyor's Office, Desborough.
„ 1	Hove, Sussex—Roadmaking, &c.	——	H. H. Scott, Town Hall, Hove.
„ 1	Warrington—Carts and Vans	Sanitary Works Committee	J. Deas, Bank House, Warrington.
„ 1	Workington—Roadmaking, &c.	Corporation	J. Bintley, 7 Lowther Street, Kendal.
„ 2	Hollingbourn, Maidstone—Materials	Rural District Council	H. J. Bracher, 83 Earl Street, Maidstone.
„ 3	Ashford, Kent—Road Metal	Urban District Council	W. Terrill, North Street, Ashford, Kent.
„ 3	Hartlepool—Road Metals, &c.	Rural District Council	W. Burton, Road Surveyor, Billingham.
„ 4	Alvaston, Derby—Street Completion	Urban District Council	C. Greatorex, Council Offices, Alvaston.
„ 4	Carrickfergus, Ireland—Stones	Urban Council	Council, Town Hall, Carrickfergus.
„ 6	Crewe—Street Works	Town Council	G. Eaton-Shore, Earle Street, Crewe.
„ 6	London N.—Road Works	Hornsey Urban District Council	E. J. Lovegrove, 99 Southwood Lane, Highgate.
„ 6	Barrhead, Scotland—Causewaying	Town Council	C. E. Wardlaw, 112 Bath Street, Glasgow.
„ 29	Havana—Sewering and Paving	Military Governor	Commercial Department, Foreign Office, Havana.
	SANITARY:		
April 26	Chesterfield—Sewage Disposal Works	Rural District Council	Engineer to the Council Union Offices Chesterfield.
„ 26	West Hartlepool—Sewers	Corporation	J. W. Brown, Borough Engineer, West Hartlepool.
„ 27	Birkby, near Maryport—Sewerage Works	Cockermouth Rural District Council	J. B. Wilson, Court Buildings, Cockermouth.
„ 27	Altrincham—Sewage Works	Urban District Council	Hinnell & Murphy, 41 Corporation Street, Manchester.
„ 29	Alderley Edge, near Manchester—Scavenging	Urban District Council	Surveyor, Council Offices, Heys Lane, Alderley Edge.
„ 29	Stromness, Scotland—Sewers, &c.	Town Council	W. R. Copland, 146 West Regent Street, Glasgow.
„ 29	Thornhill, Yorks—Sewage Purification Works	Urban District Council	S. W. Parker, Council Offices, Thornhill.
May 1	Briton Ferry, Wales—Sewerage Works	Urban District Council	H. A. Clarke, Council Offices, Briton Ferry.
„ 6	Botley, Hants—Drainage	——	W. J. Taylor, The Castle, Winchester.
„ 7	London, N.—Dust Collection, &c.	Tottenham Urban District Council	E. Crowne, 712 High Road, Tottenham.
„ 7	Richmond—Lime, &c.	Main Sewerage Board	W. Fairley, Kew Gardens.
„ 7	Bradford—Portland Cement, Lime, &c.	Cleansing Committee	McTaggart, Hammerton Street Deptôt, Bradford.
„ 14	Ilfracombe—Sewers, &c.	Urban District Council	Engineer and Surveyor, Town Hall, Ilfracombe.
„ 15	Morcambe—Sewerage Works	Urban District Council	Engineer's Office, 11 Cedar Street, Morcambe.
	TIMBER:		
May 7	Tredegar, Mon.—Timber, &c.	Guardians	J. A. Shepard, Town Hall, The Circle, Tredegar.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
April 30	Keighley—Public Library	£50, £30, £20	W. H. Hopkinson, Borough Engineer, Town Hall, Keighley.
May 27	Aldershot—Schools	——	N. Clinton, Clerk to the Board, Station Road, Aldershot.
June 8	Buxton—Water Pump	£20, £10, and £5 respectively.	W. H. Grieves, Town Surveyor, Town Hall, Buxton.
„ 10	Ennis, co. Clare—Additions, &c. to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
„ 24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100 respectively	W. H. Talbot, Town Clerk, Town Hall, Manchester.
„ 24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
„ 30	Hereford—Municipal Buildings	£100, £75, £50	J. Carless, Offa Street, Hereford.
July 31	Manchester—Fire Station and Police Station	£300, £200 and £100 respectively	W. H. Talbot, Town Hall, Manchester.
No date	Gillingham—School	£10, £5	E. T. Atchison, 28 Waterloo Road, New Brompton.
„	Darlington—Row of Shops and Dwelling Houses	——	Borough Surveyor, Town Hall, Darlington.

ROBERT ADAMS, 65 & 67, NEWINGTON CAUSEWAY, LONDON, S.E.

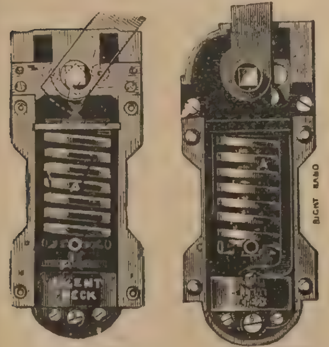
THE BEST TESTED BUILDING SPECIALITIES.

DOOR SPRINGS, FANLIGHT OPENERS, GEARING, WEATHER BARS, PANIC EGRESS BOLTS, METAL CASEMENTS AND SASHES, REVERSIBLE WINDOW FITTINGS, ETC. *60 Highest Awards in Competition.*

The "Victor" Double Action Spring Hinges. THE BEST.

The Best Overhead Pneumatic Silent Check Door Spring, the "Empress Victor."

Greatest Variety of Fanlight Openers and Gearing in the World.



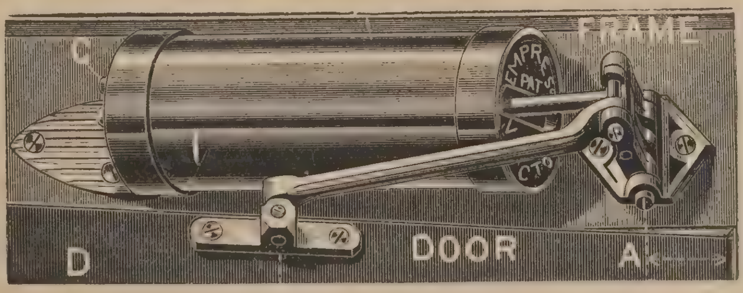
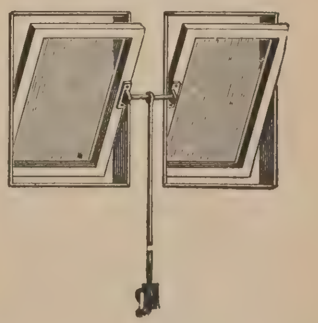


Fig. 1, as fixed on face of door.



CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Hay, best	per load	1	0	0	4	10	0
Sainfoin mixture ..	do.	3	10	0	4	10	0
Clover, best	do.	4	5	0	5	0	0
Beans	per qr.	1	8	0		—	
Straw	per load	1	8	0	1	16	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.	1	2	2	1	12	1
Colza Oil, English ..	do.	1	7	9		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	1	0		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	$4\frac{1}{2}$		—	
Linseed Oil, barrels ..	do.	1	8	3		—	
Petroleum, American ..	per gal.	0	0	$6\frac{5}{8}$	0	0	$6\frac{7}{8}$
Do. Russian ..	do.	0	0	$6\frac{3}{8}$	0	0	$6\frac{1}{2}$
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	2	18	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	5	6	1	6	0
Tar, Stockholm	per barrel	1	8	0		—	
Turpentine	per cwt.	1	6	3		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	84	0	0		—	
Iron, Staffs., bar ..	do.	6	10	0	9	10	0
Do. Galvanised Corrugated sheet ..	do.	11	0	0		—	
Lead, pig, Spanish ..	do.	12	7	6		—	
Do. do. English common brands	do.	13	0	0		—	
Lead, sheet, English, 3lb. per sq. ft. and upwards	per ton	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do. floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	5	0	6	10	0
Do. Mild Bars	do.	7	5	0	7	15	0
Tin, Foreign	do.	117	5	0	117	15	0
Do. English ingots ..	do.	120	10	0		—	
Zinc, sheets, Silesian ..	do.	20	10	0		—	
Do. do. Vieille Montaigne	do.	21	0	0		—	
Do. Spelter	do.	16	15	0	17	0	0

TIMBER.

Soft Woods.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel ..	per load	3	0	0	4	0	0
Pine, Quebec Yellow ..	do.	4	7	6	6	0	0
Do. Pitch	do.	2	10	0	2	15	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	0
Do. Petersburg ..	per bundle	0	0	9	0	0	$10\frac{1}{2}$
Deals, Archangel 2nd & 1st	per P.Std.	9	10	0	12	10	0
Do. do. 4th & 3rd	do.	11	15	0	13	5	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	14	15	0	15	5	0
Do. do. 2nd „	do.	8	15	0	14	15	0
Do. do. Unsorted „	do.	5	5	0	13	0	0
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	9	15	0	16	0	0
Do. White Sea ..	do.	9	15	0	13	0	0
Do. Quebec Pine, 1st ..	do.	22	0	0	23	0	0
Do. do. 2nd ..	do.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0	12	15	0
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Deals, New Brunswick ..	per P. Std.	7	5	0	8	0	0
Battens, all kinds ..	do.	6	10	0	9	15	0
Flooring Boards, 1in. prepared, 1st ..	per square	0	12	0	0	13	0
Do. 2nd ..	do.	0	9	6		—	
Do. 3rd &c. ..	do.	0	7	9	0	10	6

Hard Woods.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba ..	per ft. sup.	0	0	4		—	
Do. Honduras ..	do.	0	0	$3\frac{25}{32}$		—	
Do. Tobasco	do.	0	0	$3\frac{1}{4}$		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0	0	$4\frac{21}{32}$		—	
Do. African ..	do.	0	0	$2\frac{29}{32}$		—	
Do. St. Domingo	do.	0	0	$6\frac{3}{8}$		—	
Do. Tobasco ..	do.	0	0	$3\frac{3}{16}$	0	3	$4\frac{21}{32}$
Do. Cuba ..	do.	0	0	$4\frac{29}{32}$	0	0	$3\frac{13}{16}$
Oak, Dantzic and Memel	per load	3	15	0	5	7	6

Tramway Enterprise in New Zealand.—To the Roslyn Tramway Co., of Dunedin, belongs the honour of being the first to introduce cable tramways in the Australasian colonies. This was twenty years ago, and it is somewhat curious to note that the same company is now the first to introduce an electric tramway into New Zealand. The overhead trolley system has been adopted, and the whole of the work has been carried out by the British Westinghouse Co

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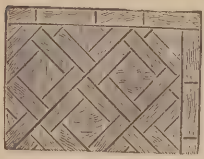

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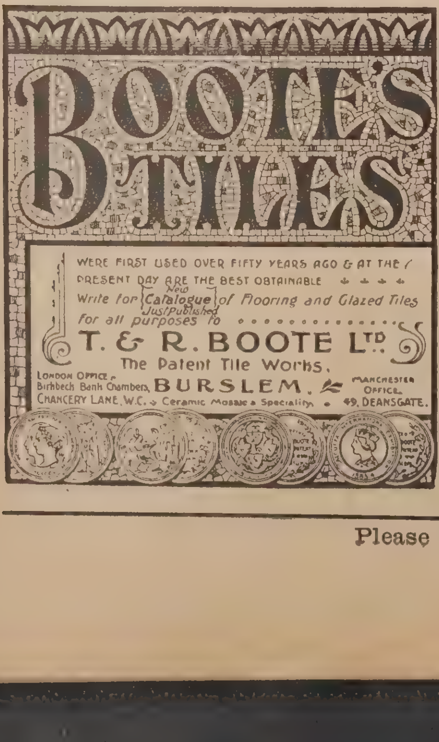

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BUILDING TRADES' EXHIBITION, 1901.

SPECIAL SUPPLEMENT.

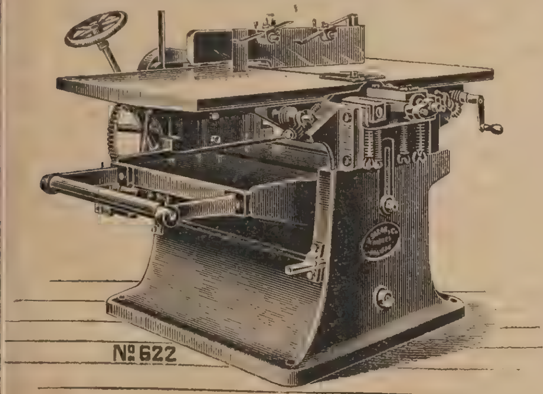
THE Building Trades' Exhibition now open at the Royal Agricultural Hall, Islington, is, as we have already stated, the most extensive of its kind yet held in this country, and we give this week a Supplement containing particulars of all the chief exhibits. This will be found of special use to those who, though interested to know all that is new in the building and allied trades, are unable to attend the Exhibition themselves. It is of course impossible for us to notice all the exhibitors, who number nearly 300, but we think that our selection will be found a thoroughly comprehensive one. This year special sections are devoted to fire prevention and smoke combustion (though the latter is somewhat disappointing), and a new feature is an exhibition of architectural drawings, in a room off the gallery.

On Thursday last a party of fifty Germans visited the Exhibition, and were entertained at a banquet by the Institute of Clayworkers. On Friday the Institute of Builders paid a visit, and the Architectural Association on Saturday, while the general public have assembled in great numbers. For further announcements see last page of Supplement.

J. SAGAR & CO.

The exhibit at Stand No. 152, Wall Space, of Messrs. J. Sagar & Co., wood-working machinists, of Halifax, is an excellent one. A number of machines are shown, of which the following are the most important :—

"Premier" planing-out-of-twist, jointing, squaring-up, moulding and thicknessing machine, for hand- and roller-feed. This is a most useful machine, as it will plane from $\frac{1}{16}$in. to 7½in. thick, and up to 20in. wide. Hand grinding machines suitable for plane irons up to 24in. long, and also for grinding all shapes of moulding cutters. Automatic grinding machine suitable for plane irons up to 26in. long. Band sawing machine, with 30in. saw pulleys and canting table. Vertical-spindle moulding and shaping machine, for working with cutters through the spindle in the French style, or with grooved collars and square cutter-blocks (the spindle is arranged to work right or left at option, and is fitted with roller-feed gear for new features in top and side-pressure apparatus ; countershaft separate from machine. Improved and two side spindles for planing and edge moulding-up to 18in. wide by 5in. thick ; three pairs of feed-rollers give a powerful straight work). Improved tenoning, scribing and cross-cutting machine, hand-feed planing, jointing, moulding, &c. machine, circular-saw bench with rising and falling table 4ft. 8in. by 2ft. 4in., suitable for saws up to 32in. diameter, new-pattern builder's power mortising and boring machine, and an improved four-cutter-planing and moulding machine for working mouldings, &c., on four sides at one operation up to 4in. by 2in. ; also a machine for planing panels, thicknessing, tongueing, grooving, moulding, &c., a double vertical-spindle moulding and shaping machine, and similar wood-working machines.



BRITISH URALITE CO., LTD.

The British Uralite Co., Ltd., of 37, Lombard Street, E.C. (Row D, Special Position No. 3), exhibit a hut constructed with the new material "Uralite," suitable for colonial and military purposes, for temporary use in connection with the housing of labourers on public works, mining corps, go-downs, sheds, &c., and for any purpose where a fire-resisting material is desirable, and where it is advantageous to keep a building cool in summer and warm in winter. It is insect-proof and cannot be injured by white ants, and it will not decay, dry-rot, mildew, or sustain damage from atmospheric change. Owing to the lightness of the material it is very portable, and therefore suitable where long and difficult transport of material is necessary. The contents of the hut show how Uralite can be veneered for panelling the interior of houses, the cabins of ships, for railway carriages, and numerous other purposes ; also how it can be painted, grained, and polished, used for parquet flooring, &c., in every case forming a fire-resisting material. In the Fire Prevention Section the firm show, different forms of partitions and ceilings in which Uralite slabs are substituted for match-boarding or plastering, with the object of rendering these partitions or ceilings fire-resisting.

The company have extensive works for the manufacture of the material near Higham, in Kent.

BROWN'S PATENT KILN, LTD.

Stand No. 129, Row F, is occupied by Messrs. Brown's Patent Kiln, Ltd., of Essex Wharf, Durward Street, Whitechapel, E. A large model of their patent continuous kiln, to burn 80,000 bricks per week, is exhibited. It has sixteen chambers constructed with vertical side walls strongly braced with steel joists and tie-rods. The material shown is manufactured by Eredi Frazzi, of Cremona. It is all in the nature of hollow brick, and is characterised by extreme lightness and great strength It has been awarded gold medals at Turin, Bozzolo, Nice, Como, Naples, and Paris. It is remarkably uniform in texture, and also perfectly true—so much so that at Paris the firm exhibited two hollow slabs, 10in. wide and 3in. thick, 20ft. in length, and perfectly straight.

Kilns are now in course of construction for the Norbiton Pottery and Brick Works, Limited, at New Malden ; for the Stourbridge Brick Company, Cambridge ; and for J. C. Edwards, of Ruabon. A Hoffmann kiln, at Bourlon in France, is in process of alteration to the system of Brown's patent.

F. McNEILL & CO.

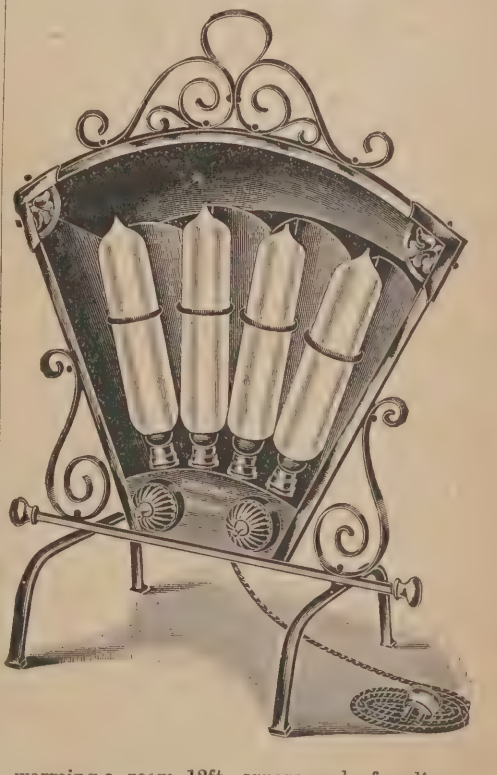
Felts, damp-course materials, slag wool and pipe coverings form the exhibit of Messrs. F. McNeill & Co., of Lamb's Buildings, Bunhill Row, E.C. (Stand No. 92, Row D). Their patent asphaltic roofing felt is obtainable in rolls 25yd. and 30yd. long and 32in. wide ; the sarking or slaters' felt is similar, but thinner. The bituminous felt is free from offensive smell, and is used for placing under roofs and for lining walls. Messrs. McNeill's patent metal-asphalt damp-course consists of sheet lead fixed between two layers of fibrous asphalt, thus being perfectly impervious to damp : a slab 4½in. by 32in. costs 6d. The approximate cost per yd super. of various kinds of damp-courses is estimated as follows : Slates and cement (two courses), 4s. 6d. ; best asphalt, 6s. ; sheet lead, 6s. to 8s. ; blue bricks, 5s. to 6s. ; tar and sand, 1s. 6d. ; fibrous asphalt, 7s. 6d. ; patent metal-asphalt, 5s. With regard to slag wool, it is a feature of this firm's system of packing that the wood joists or studs are arranged vertically and horizontally in such a way that the transmission of sound by them is greatly reduced. The firm have recently secured the order for the cold storage and insulation work on the new White Star liner, the "Celtic."

MOREAU MARBLE CO., LTD.

The claim of the Moreau Marble Co., Ltd., of 79, Lot's Road, Chelsea, S.W., is that their material is not an imitation, but genuine, marble —the production in six weeks of what Nature took centuries to make. The basis is ordinary soft white limestone, and it is in this state that all carving, &c., is done. Afterwards the stone is placed in a metallic solution in order to obtain the desired colour, which permeates the whole block ; then it undergoes a hardening process to obtain the crystalline structure of marble, and finally it is dried and friction-polished. The firm guarantee that it will wear as well as Nature's marble, though it is only one-third as costly. Specimens are shown at Stand No. 94, Row D. Messrs. Alfred Waterhouse, Paul Waterhouse and C. F. A. Voysey are among those architects who have used Moreau marble.

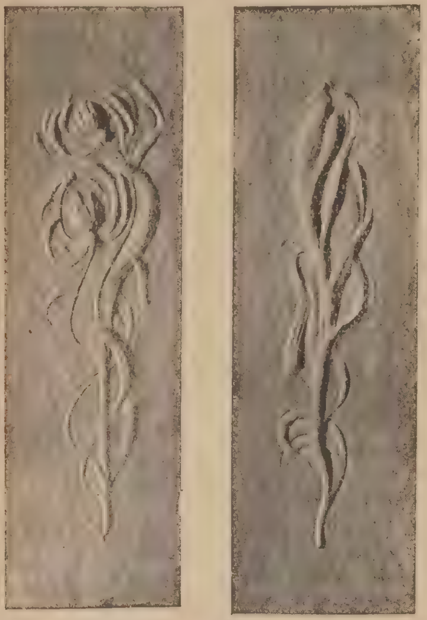
DOWSING RADIANT HEAT CO., LTD.

Stand No. 77, Row C, of the Dowsing Radiant Heat Co., Ltd. (James Melling, Dashwood House, New Broad Street, E.C.) is made very cheerful and warm in appearance by the Dowsing radiators. These consist of a back and side of copper, in front of which four electric heat lamps are fixed, being connected up in pairs so that two or four lamps may be used at will. A radiator of this kind consumes 1 unit of current per hour, and is usually found of ample capacity for warming a room 12ft. square and of ordinary height. For large rooms two or more radiators may be used (they cost four guineas each). The fact that it is possible to at once obtain warmth and cheeriness—and this without fumes, dirt, or consumption of oxygen—has secured for these radiators a large sale. Nine of them were sent to the Isolation Hospital at Leyton, and the matron has recently written to say how much they are appreciated both by patients and staff.



B. DELLAGANA & CO., LTD.

At Stand No. 74, Row C, is exhibited the new metallic decoration produced by Messrs. B. Dellagana & Co., Ltd., of 11, Shoe Lane, Fleet Street, E.C. Two panels made after this manner are illustrated below. The process consists in the exact reproduction in copper and other metals of designs in the most plastic and perishable materials—wax, plaster, &c. In conjunction with Messrs. George Roselieb & Son, of Kennington, a provisional patent has been obtained for the process of producing high-relief undercut ornamental metal work of a kind hitherto only producible by highly-skilled labour at a prohibitive cost, and arrangements have been made with competent artists by which original models, carvings, repoussé or other designs can be rendered in metal form by electro-deposition. The copper can be obtained bright, polished or of a beautiful green-bronze, and colour contrasts are easily secured; for instance, a relief ornament in bright copper can be obtained standing out from a white metal ground. The process reproduces sharpness of line and grace of curve perfectly, and is not costly.



W. HÖFLER.

Mr. W. Höfler is a maker of high-class hammered ironwork for architects, interior decorators, electrical engineers and others. Some fine specimens are to be seen at his stand (No. 64, Row C). These include finger plates, electric light and gas fittings, door and cabinet furniture, fire-irons, &c.; and particularly a very handsome large iron grille, Renaissance in feeling and well executed. Mr. Höfler also deals in art castings, French paperhangings, art fabrics, Medmenham pottery tiles (produced under the direction of Conrad Dressler), French and Austrian parquet flooring, and wood chimney-pieces and furniture, all of which may be seen at his newly decorated premises at 26A, Soho Square, W., which is part of the historic "Carlisle House" built in 1669, the town residence of the Earl of Carlisle.

MINTONS, LTD.

The exhibit at Stand No. 62, Row C, of Messrs. Mintons, Ltd, of 25, Farringdon Avenue, E.C., consists chiefly of several wall panels in coloured tiles. The most attractive are those possessing a raised outline and being painted in coloured glazes. The effect of this method of treatment is very pleasing, as the design is made more decorative and the colour scheme heightened in tone. The work is excellently carried out, both as regards design and technique, and shows that the firm are following new and improved standards in wall decoration. In the matter of tiles, as in everything else, *chacun à son goût*; and while some prefer those with a perfectly even and spotless surface, others consider the old kind of tiles—made by hand, with a spotted and uneven surface—to be the best. Messrs. Mintons make both kinds, each well. Architects visiting the Exhibition should make a point of inspecting this stand, as it will amply repay them to do so.

LONDON HOIST AND CHAIN CO., LTD.

The London Hoist and Chain Co., Ltd., of 103, Worship Street, Finsbury, E.C., exhibit their pulley blocks and other lifting tackle at Stand No. 57, Row B. The "Samson" patent double-worm pulley blocks are tested to 50 per cent. beyond their lifting capacity, and, when required, a test certificate for the chain may be obtained. This chain is of the best quality and workmanship. The hand chain-wheels are of cast steel, the frames, hooks and bolts are of forged steel, and duplicate parts are self-acting. The "Weston" differential pulley blocks made by the firm are fitted with patent roller chain guides, which prevent troublesome locking, are self-adjusting, and form a guide for every loop of chain. Four feet of chain are required for every foot to be lifted. The "Crane" patent pulley block (J. T. Pickering's system), as its name implies, is far-reaching, and is a cheap and effective apparatus for raising loads when a jib crane is not applicable; in this respect it is specially suitable for abattoirs, engine rooms, printing establishments or retort houses.

FREDERICK JONES & CO.

Messrs. Frederick Jones & Co., of 1A, Perrin Street, Ryland Road, Kentish Town, N.W., were the pioneers of that excellent sound- and fire-proofing material, slag wool, or silicate cotton. For years past they have supplied large quantities of it to the trade, and it has been used by such architects as the late Sir Arthur Blomfield in the Royal College of Music, by Mr. Mountford in Battersea Town Hall, by Mr. Alfred Waterhouse in the Clergy Orphan School at Bushey, by Messrs. Ernest George & Peto in Lord Stalbridge's mansion, and for preventing the sound passing between St. George's Hall and the Queen's Hall (about 60 tons were needed in the last-mentioned case); so that it needs little else to recommend it. The firm are now introducing a patent new system for ceilings and partitions, which consists in combining the advantages of expanded metal and silicate cotton. The cotton is firmly fixed in the metal, and the whole is then plastered in the usual way, the result being a partition which will withstand the fiercest fire and one that will not transmit the heat from one side to the other. This system should be carefully examined at the firm's stand in the Fire Prevention Section. The above illustration shows Messrs. Jones's works at Southbank, Yorks.

MESSRS. FREDERICK JONES & CO.'S WORKS AT SOUTHBANK, YORKS.

MOULE'S PATENT EARTH-CLOSET CO., LTD.

Forty years ago the dry-earth system of dealing with closet refuse was introduced by the Rev. Henry Moule, Vicar of Fordington, Dorset—at first for the benefit of his poor parishioners, and afterwards as a commercial enterprise; and there can be no doubt that earth-closets have many advantages to recommend them. Moule's patent earth-closets (to be seen at Stand No. 55, Row B) are made in eight different forms, the principle, however, being the same throughout, consisting of a tapered receptacle at the back to hold the earth and a hand lever for discharging it into the pan (each form throws 1½ pint of earth every time). The earth used must be of a loamy nature, perfectly dry and finely sifted—this is proved to be the best deodorant and the best disinfectant. Where, however, it is difficult to obtain a sufficiency of such earth, sifted ashes may either wholly or in part be used. It is interesting to note that six persons will require 1 cwt. of earth per week. The address of Moule's Patent Earth-Closet Co. is 5A, Garrick Street, Covent Garden, W.C.

J. C. BROADBENT & CO., LTD.

Messrs. J. C. Broadbent & Co., Ltd., of London, Redcar, Hazlehead, and Huddersfield, occupy Stand No. 50, Row B. One of their specialities is a patent slag-wool sectional pipe covering, which is made in 3ft. lengths for pipes up to 18in. diameter. The covering can be removed and replaced at any time, and will not crack or break. The firm's slag-wool is a pure mineral fibre manufactured from Cleveland slag, and contains a large percentage of silica and aluminia and a small percentage of free lime (which makes slag-wool liable to pulverise and settle). It is largely used for cold storage insulation and for fire- and sound-proofing ordinary buildings. For the latter a partition may consist of 2in. by 3in. struts, matchboarding to give a solid side for packing, and the slag-wool put in between wire netting. The cost of wire netting for both sides is about ¾d. per sq. ft.; and slag-wool 3in. thick about 2½d. per sq. ft. A partition of the kind described satisfactorily withstood a test lasting three-quarters of an hour made by the British Fire Prevention Committee in January, 1900.

GRANITE SILICON PLASTER CO., LTD.

Granite plaster is an artificial stone composition intended to take the place of lime and hair plaster for covering inside walls, ceilings, &c. It is manufactured in the form of a fine powdered material, put up in sacks, and is made ready for use by the addition of sand according to requirements, though for work in London a material already mixed with sand is obtainable. It is applied in the usual way, dries quickly (in twenty-four hours), and when set is "as hard and lasting as granite stone" (to quote the firm's own words). A solid partition is made with an expanded metal core covered with 2in. of granite plaster mixed with a proportion of clean sand. It will bear rough treatment without denting, chipping, cracking or loosening, will not absorb disease germs, and is rat- and mice-proof. It has been largely used by the War Office and General Post Office authorities. The firm's address is 36, King's Road, St. Pancras, N.W., and the stand is in Row B, No. 47.

EMDECA METAL DECORATION CO.

Emdeca decoration, to be seen at this firm's stand (No. 46, Row B), is made of flexible thin-gauge zinc sheets which can be cut with ordinary shears and bent around the sharpest angle without injuring the surface coating. It is specially suitable for bathrooms, lavatories, kitchens, restaurants, hospitals, &c., because it has a clean appearance and is sanitary (it can be washed with antiseptic solutions). The sheets are fixed in position by a paste made of two parts of ordinary whiting and one part of white lead, well ground and thoroughly mixed with varnish until of a slightly liquid consistency. Sheets can be applied to wood as well as to plaster, but *not* to walls or ceilings newly rendered with Portland cement. Another novelty of this firm are the American stamped steel ceilings, which can be obtained in a variety of patterns. The joints are made either with an ornamental beading in which the nails do not show, or on a small bead moulding with countersinkings at regular intervals. The trade price for these ceilings is from 2s. 6d. to 3s. 6d. per sq. yd. The company's address is 97, Queen Victoria Street, E.C.

BRITISH OPAL WALL-GLAZING CO., LTD.

Glazed goods of every description are being increasingly used in all kinds of building and sanitary work, and notice should, therefore, be taken of all novelties. One of these is the patent opal glass made by the British Opal Wall-Glazing Co., Ltd, whose works are at Stourbridge and registered office at 12, Dartmouth Street, Queen Anne's Gate, S.W. (their stand is No. 45, Row B). This material, which is intended as a substitute for glazed bricks and tiles, has a backing of the same ingredients as the material itself; and the cement used for affixing to walls, &c., is damp-proof and of a special elastic character. This slabs can be produced for w.c.'s, lavatories, &c., of any size up to 7ft. high by 6ft. 6in. wide and $\frac{3}{4}$in. thick. They are covered on both sides with British opal. The company's own productions are supplied in a variety of tints, and can be formed to bullnoses, angles, beads, &c., and architects' own designs can be executed.

CRANSTONE ENGINEERING WORKS, LTD.

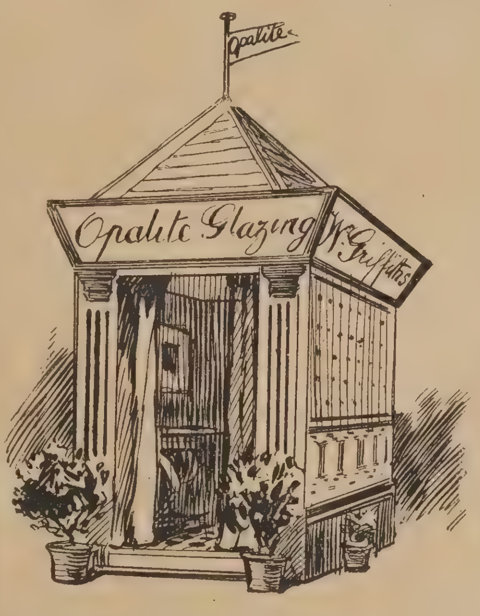
Stand 42, Row B, is the exhibit of the Cranstone Engineering Works, Ltd. (the Pickering Block and Hoist Co.), of Hemel Hempstead. Here may be seen all kinds of lifting tackle. The most recent novelty shown is a patent self-sustaining quick-speed sack hoist, which, while very rapid in action, is perfectly self-sustaining. The 3-cwt. size costs £3 10s., the 5-cwt. size £4 5s. The "Universal" friction hoist was specially designed with a view to compactness. It can be fixed in any position—on top of or below beams, vertically or horizontally—works easily and silently, and is preferably fitted with a patent automatic stop-action to prevent overwinding. The shafts run in gun-metal bearings. The "Standard" friction hoist made by this firm is worked by hand and power, being specially intended for use where the motive power is intermittent. Two other patents of the firm are the "Reliance" and "Gripper" friction clutches and "Excel" clutch lever.

OFFA VENTILATING CO.

The Offa Ventilating Co., of 63, Basinghall Street, E.C., who occupy Stand No. 14, Row A, exhibit their patent "Offa" inlet ventilator. This consists of a frame carrying an air-filter (of rough open cloth) covered by a movable face-plate on which the incoming air strikes, and is diffused all over the wall—that is to say, the air is prevented from rushing forward and creating a draught, as it issues directly from the sides of the ventilator, and so spreads itself. A model on the stand demonstrates this. No draught is perceptible within 6in. of the wall. These ventilators are made, complete for fixing, in five sizes, from 10in. by 7in. to 21in. by 18in. They can be adjusted to a nicety, or closed entirely. The whole of the interior is easily accessible from inside the room on which the ventilator is fixed, and the filter screen can be readily removed for cleansing purposes. This firm exhibits Mallable's patent bracket for fixing Venetian blinds, by means of which the blind is securely held without screws, allowing it to be taken down and replaced by one person, however inexperienced. The first cost is only 6d. per window.

NATIONAL OPALITE & GLAZED BRICK & TILE SYNDICATE, LTD.

The London concessionaire of this firm is Mr. William Griffiths, of 41, Hamilton House, Bishopsgate Street Without, E.C. (his stand is Special Position No. 8, Row E). "Opalite" is a plate or tile made from pure opal glass, in almost any colour, having a rough granular back, which is incorporated in the opal itself. It is a patented composition, of an exceedingly tough nature. One of the reasons why it is superior to the ordinary clay tile is that it sticks not only at first, but always. "Opalite" tiles form a perfect mechanical bond with the cement to which they are affixed. The material does not by exposure to damp, frost, or heat lose any of its beautiful polished surface, neither does it discolour, decay, or become patchy. It is readily repaired. Both old and new brickwork can be glazed, and the advantages of having walls glazed after the brickwork is finished are strongly urged, to secure a close joint and avoid a heavy waste in breakages. It is made in a variety of tints and sizes, and can be formed into bullnoses and angle beads. The ordinary stock sizes are 9in. by 3in. and 6in. by 6in. The reflecting power is excellent, the light being uniformly distributed. This advantage will be readily appreciated for subways, passages, basements, &c., where borrowed light is a necessity. This is the only opal glazing with a granulated back fluxed on. More than 80,000yd. of this material have been fixed by the London concession alone. It has been used at Windsor Castle, Central London Railway, Stock Exchange, and in a number of other important buildings. We illustrate above Mr. Griffiths's stand at the Exhibition, which we are enabled to do through the courtesy of the "Daily Graphic."



WALTER E. MASON.

Stand No. 90, Row D, is occupied by Mr. Walter E. Mason (late A. Mason & Sons), whose works are at Horwich, Lancs. This is the first time his goods have been shown on exhibition in London. No lead is used in the composition of any of the glazes, and all goods are made from fireclay. One of the chief exhibits is a combination lavatory and vegetable sink, 6ft. long in one piece, in white porcelain enamelled fireclay mounted on glazed pedestals with iron bases; exposed open overflows is a feature of most of his sinks and basins, facilitating convenient and efficient cleansing. Another prominent exhibit is a hexagonal urinal in white enamel with imitation marble facings. The tank at the top is fitted with automatic drop-by-drop cistern, and can be supplied with water in the form of small fountain spray, so assisting ventilation and giving an effective and pleasing appearance. This urinal (as are all others on this stand) is fitted with Mason's patent flushing nozzle, which throws a fan of water without a splash over the whole back of the stall. Treads are also provided with mosaic panels, providing secure foothold, yet impervious to moisture. Mason's patent siphonic "Maelstrom" closet is practically noiseless, and will work with 2 gall. of water. It has a 5½in. seal, a water area 12in. by 10in., and cannot be siphoned except when in use. This closet is shown under water. Closets with Mason's "Sanitary" and "Anatomical" seat pads, recommended for rough use and public conveniences, are also shown, as well as a number of baths and basins. A novel, artistic and most pleasing exhibit is the "Ruby" lavatory basin, which is oval and can be built with a corbel into the wall, or stand away from the wall on a centre pedestal. As it is Mr. Mason's intention to open showrooms in London, architects and others interested in sanitary goods should take the opportunity of inspecting these exhibits. Depots and showrooms have already been established in Manchester, Liverpool, Glasgow, Hamburg, Rotterdam, Warsaw and Cape Town.

JOHN SUTCLIFFE & SON, LTD.

Saw benches, planing machines and other kinds of wood-working machinery are to be seen at work at the stand (No. 156, Wall Space) of Messrs. John Sutcliffe & Son, Ltd., of Arden Works, Halifax. Sutcliffe's hand-planing and jointing machine (D 1) is useful for all kinds of joinery and cabinet-making. Without changing the cutters it will do planing-out-of-wind, surfacing, jointing, chamfering, rebating; while by fixing special cutters, tongueing and grooving and stick light mouldings can be executed. With these machines a very simple and effective hand-guard can be used. Its form is implied by its name—"the Boomerang." The only attachment is to a bracket fixed by a set-screw to the table of the machine. Normally it presses against the fence, covering the whole length of the cutters, but as the wood is fed forward it pushes aside the guard, which, however, still covers the cutters. Its price is 25s. complete. Three band-saws of different qualities are also shown at this stand. Some of the machines are driven by a 4 h.p. electro-motor.

JOHN TANN.

The exhibit at Stand No. 145, Wall Space, is in every way a safe one, for here are shown all the strong-room and burglar-resisting appliances of Mr. John Tann, of 11, Newgate Street, E.C. The "Anchor Reliance" safes have outer bodies made of best steel plates ½in. thick, but solid at the corners, and strengthened at the front by a steel T-frame in combination with a patent continuous interlocking wedge-resisting arrangement. The doors are of solid steel plates ¾in. thick. One of the most recent testimonials is from a firm of diamond merchants in Hatton Garden, where burglars made an unsuccessful attempt to break open one of these safes, the hardened drill-proof plate over the lock proving too much for them. Mr. Tann's party-wall doors are recommended by the Fire Insurance Committee; they are panelled on both sides with 3in. by ¼in. bars, the plates being of steel ¼in. thick.

HODKIN & JONES.

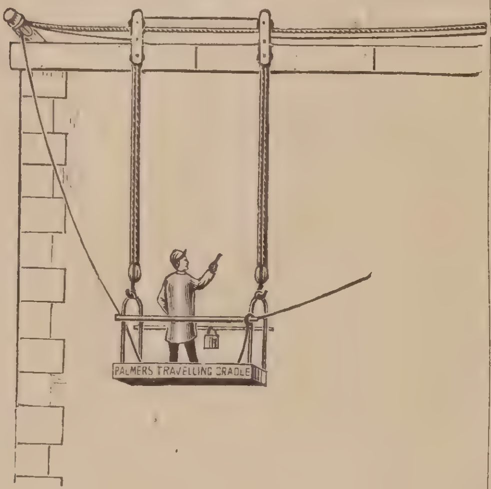
Messrs. Hodkin & Jones, of Havelock Bridge Works, Queen's Road, Sheffield, exhibit at Stand No. 118, Row F. They execute all kinds of mosaic and terrazzo work, paving in the latter being laid from 7s. per yd. super. The firm is, however, devoting special attention to concrete masonry or artificial stone, such as staircases, moulded cornices, columns, heads and sills, balustrading, &c., specimens of which are exhibited. Messrs. Hodkin & Jones claim that their masonry is practically imperishable. does not flake or crumble, of even texture, uniform colour and high-crushing strain, and is fireproof. The material has been largely used in many large buildings throughout the country, especially theatres. The offices and works of the firm at Sheffield occupy three acres of ground.

YATES, HAYWOOD & CO.

Some very pleasing mantles are exhibited by Messrs. Yates, Haywood & Co., of 95, Upper Thames Street, E.C., at their stand (No. 141, Wall Space). Several of these follow standards first set up by the arts and crafts movement, and the designs show a careful treatment; though simple, they are very effective. Some are in iron painted white, with black hoods and plain tiles at the side and on the hearth of a soft green tint, while others are in wood of various kinds—chiefly oak and walnut. A prominent exhibit is a large mantel in rosewood with side pillars, an effective piece of work. Registers, stoves, fenders, the patent "Quadrant" kitchener (in action) and the patent "Guinness" self setting range are also to be seen at this stand.

PALMER'S TRAVELLING CRADLE, LTD.

In Bay No. 2 Messrs. Palmer's Travelling Cradle, Ltd., of 250, Westminster Bridge Road, S.E., are again exhibiting their "Builder's cradle." This apparatus, illustrated on this page, is a small light cradle suspended by falls from specially constructed blocks, which travel along a wire rope or cable—the whole being so simple, light and easily worked that the cradle is taken all over the surface of the wall or front worked upon by the men working in the boat. "Palmer's" exhibit comprises a full-sized cradle fixed at each front of the stall on a cable with a 23ft. run, and gives an exact representation of the appliance as ordinarily fixed; and a visit to "Palmer's" stand will at once demonstrate why this useful invention has so quickly achieved such striking success. Another of this firm's exhibits is a "travelling scaffold," which is likely to be of great use to the trade. This "scaffold" consists of four ladders as standards securely-braced together by adjustable wire stays, and carrying a stage 9ft. by 6ft., the whole constructed on a movable platform. Each part is easily detachable, thus rendering the apparatus very portable; whilst when erected it is perfectly rigid and secure, and readily moved from place to place without dismantling. A unique feature of Palmer's business is that, by arrangement with The Accident Assurance Co., they insure the hirers and their workmen against all accidents occurring to or caused by the cradles whilst the workmen are working in them.



J. A. KING & CO.

This firm is exhibiting their "Mack" patent fireproof and soundproof slabs and blocks at two stands—No. 49, Row B, and No. 18 in the Fire Prevention Section. This invention is a very valuable one, and the exhibits should be seen by everyone visiting the Exhibition, as so much attention is now being devoted to fire prevention. The "Mack" slabs have hollow reeds embedded in a specially prepared plaster, thus forming air chambers making the slabs more soundproof, and in addition strengthening the slabs and enabling them to be sawn and nailed like boards. Fireproof partitions may be fixed of almost any length without intermediate supports with the 2in., $2\frac{3}{4}$in., and 4in. (hollow) slabs. The slabs are 12in. wide and 6ft. long, and are built up, like brickwork, with a break joint, and finished with a coat of plaster. Partitions are also erected with the 2in. vertical hollow block which requires no finishing coat, the blocks having smooth faces on both sides. For floors hollow "Mack" slab lintels are placed on the bottom flanges of iron joists, and over these are spread a layer of sand and then about 2in. of concrete. Hollow pugging blocks, $2\frac{3}{4}$in. and 4in. thick by 3ft. 6in. long, are made for placing between wood joists The ceiling and lining slabs are 12in. wide, 4ft. 8in. long and $\frac{3}{5}$in., $\frac{4}{5}$in., 1in., and $1\frac{1}{4}$in. thick, and merely require nailing to the joists with galvanised iron nails, and the whole floated and set with plaster. Thin slabs, with a damp-proof backing, are also made for lining damp walls. As a proof of the extraordinary fire-resisting qualities of these slabs we need only refer to the test made by the British Fire Prevention Committee for one hour and fifteen minutes on a $2\frac{3}{4}$in. slab partition to a temperature of over 2,000 degs. Fahr., followed by the application of water from a fire-hose. The partition was found intact after the test. The address of Messrs. J. A. King & Co. is Bridge House, 181, Queen Victoria Street, E.C.

G. TUCKER & SON.

At Stand No. 132, Row F, will be found a good show of specimens of clay work for elevations. A particular feature is the architectural work in red or buff terra-cotta, and hard bricks for sewers, manholes, &c., for which Messrs. G. Tucker & Son, of Loughborough, Leicestershire, are so well known. Most of their exhibits are specimens of work from buildings in progress, and not goods specially manufactured for exhibition. This stand is well worthy of the attention of architects, surveyors and builders, who can be assured they will get materials equal to those shown.

NUNEATON ENGINEERING CO.

The chief exhibit at the stand (Bay No. 14) of the Nuneaton Engineering Co., of Nuneaton, is Stanley's mutiplex vertical-die tile-press, which has a capacity of 5,000 an hour. It has ten dies, so that ten tiles are made at each revolution, the pressure being on the end and not on the face of the tile; the faces are glazed as the tile is ejected from the die. It is claimed that sharper arrises, closer density and finer finish are obtained than is possible with any other press, while the cost is ten times less and the output ten times greater. Stanley's "Twentieth Century" brick machines (semi-dry process) have a capacity of 8,000 bricks in ten hours for a single press. The "Twentieth Century" top and bottom hand brick-press is also shown at this stand, as well as an ingenious machine for compressing the sockets of clay pipes.

LIBRARY SUPPLY CO.

Of late years, chiefly as the result of American enterprise, library and office fitments have undergone considerable change. The roll-top desk has come to stay, and the numerous varieties of file cabinets are a great advance on the old-fashioned methods. Up-to-date fittings of this kind are the speciality of the Library Supply Co., of 181, Queen Victoria Street, E.C. (Gallery Bay, No. 23). The card-indexing system enables all sorts of new matter to be added, or old matter withdrawn, without disturbance. With this system only one thing is dealt with at a time, every single item having a separate record and place. The index consists of a series of cards, printed and ruled according to the nature of the matter to be indexed, arranged alphabetically or otherwise in trays or drawers. The cards are placed in rows on their edges, and are kept in place by a rod. All kinds of cabinets on this system are shown. A large assortment of desks, chairs, and other office and library furniture is also shown.

THAMES BANK IRON CO.

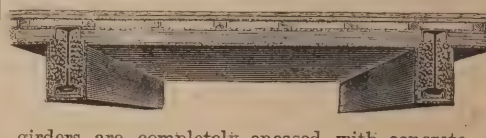
Bay No. 6 is occupied by the Thames Bank Iron Co., of Upper Ground Street, E.C. This firm is now making a speciality of iron pipes and connections for sanitary work. These are coated with Dr. Angus Smith's solution, and can be obtained in a great variety of patterns to suit all kinds of joints. Bends with inspection covers can be had with bridle and screw fastening for covers instead of bolts. A number of "Hamilton" radiators for hot water or steam are exhibited at this stand. These are put together with the smooth steel nipple, which does not need packing. The lower portion of each loop of the radiator has flanges cast on the sides, and when the loops are connected together the flanges meet and form large flues up which the cold air from outside passes and is warmed before entering the room.

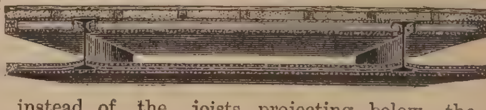
RIPOLIN, LTD.

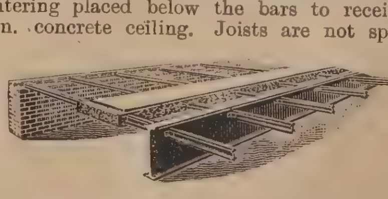
Some very satisfactory specimens of painting with "Ripolin" are to be seen at Bay No. 3. This paint can be obtained flat or glazed; and it is claimed that as it possesses extra covering capacity (with 1 gal. about 65 sq. yds. can be painted one coat) and great durability, it is for all industrial purposes cheaper than other paints—that it saves labour, and has a finish equal to the best varnish. It can be used for outdoor as well as for indoor work, as it will not scale off and is unaffected by smoke and dust. Specimens of tin coated with "Ripolin" can be examined at the stand and twisted any way to show that the material does not crack. The "flat" finishes very smooth and can be washed down. The material has gained numerous awards, and it is interesting to note that the new Alexander III. Bridge at Paris has been painted with it, after tests with various paints. The London office of the firm is at 110, Fenchurch Street, E.C.

COLUMBIAN FIREPROOFING CO., LTD.

The form of floor construction adopted by the Columbian Fireproofing Co., Ltd., of 37, King William Street, E.C. (Stands Nos. 2 and 3 in the Fire Prevention Section), is finding an increasing market in this country. The system consist of special ribbed steel bars, from 1in. to $2\frac{1}{2}$in. deep, suspended from steel stirrups over steel joists, with $3\frac{1}{2}$in., 4in. and 5in. heavy ribbed bars between the main girders or resting on the walls. These ribbed bars are entirely surrounded with concrete made of the best Portland cement, sand and furnace slag or cinders. In panelled floors, as illustrated below, all the joists and main girders are completely encased with concrete, and the underside is protected by slabs of concrete having an air-space and being secured with concealed anchors. The double construction, as illustrated below, is similar; but instead of the joists projecting below the ceiling line, 1in. ribbed bars are laid on the lower flange of the joist, and a wooden centering placed below the bars to receive a $2\frac{1}{2}$in. concrete ceiling. Joists are not spaced further apart than 7ft. This construction is particularly adapted for high buildings and heavy floors. Great economy is effected by the use of these ribbed steel bars in place of rolled steel joists, while there is also a saving in concrete.







HOBBS, HART & CO., LTD.

Messrs. Hobbs, Hart & Co. Ltd., of Arlington Street, Islington, N., have their stand in the Fire Prevention Section, No. 30. They show a good selection of their fireproof doors and safes. A special feature is a "Seamless" steel safe constructed for the storage and security of deeds on parchment. It is claimed that no safe can be properly called fire-resisting unless it is protected by chemicals, which give forth a great volume of vapour when heated by the fire. This vapour is destructive to parchments, and it is claimed that Messrs. Hobbs & Co.'s safe is the only one made for their adequate protection. The parchments are placed in an inner wooden safe, which is so constructed that unless the inner door is closed the outer one will not shut. The "New Century" mortise night lock is also shown. This is a new lock, strong and of very neat appearance, and works with a very small key, quite a pleasure to use after the ordinary immense door-key. The latch can be secured, open or shut, by just turning a knob from the inside. It should be seen to be appreciated. The patent panic bolt shown works without any springs and is most simple in action.

THE NEWELLITE GLASS TILE CO., LTD.

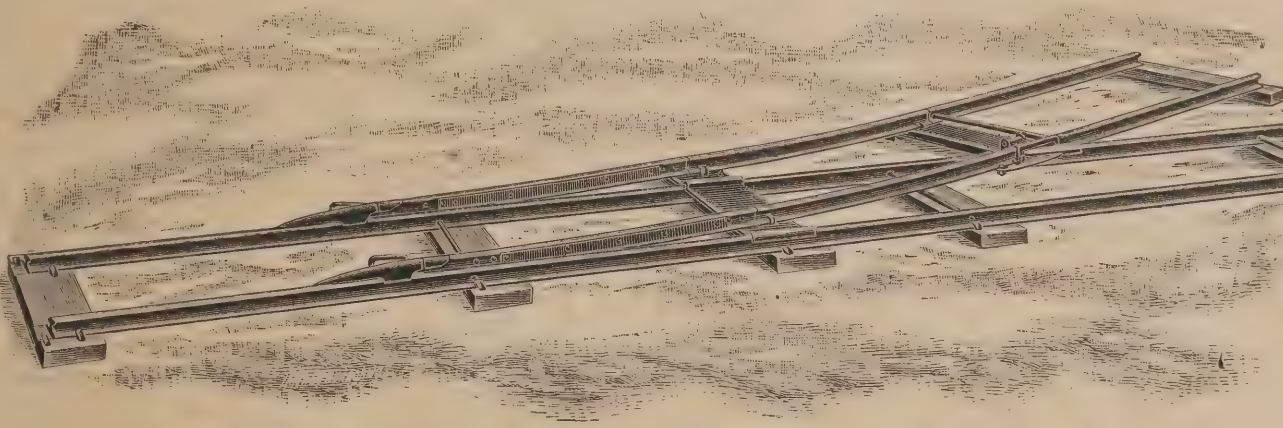
The "Newellite" opal glass tiles are now so well known that they need no special description on our part. The rough backing used is a hard one, and forms a very good key for the cement by which the tiling is fixed. One advantage claimed for the backing is that it forms an elastic film between the glass tile and the cement, allowing either substance to contract or expand independently of the other. The backing being hard, it is claimed that heat will not soften it and cause the tile to come away from the wall, as might happen with a soft backing. The patterned glass tiles shown have a most beautiful effect in their dead colours, and should meet with general appreciation. The address of the company is 139, Cannon Street, E.C., and the number of the stand 44, Row B.

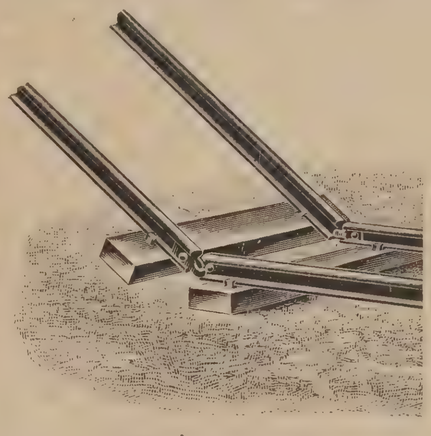
REMINGTON WABASH CO., LTD.

The Remington Wabash Co., Ltd., of 100c, Queen Victoria Street, E.C. (Gallery Bay 29), display a number of the latest up-to-date American labour-saving office appliances and fittings. Prominent amongst these are the Wabash letter-filing cabinets, the only side-opening drop-suspended filing tray on the market. The Wabash card-index system, for tabulating and recording information, has a folding rod which allows the card to be withdrawn from any part of the tray without inconvenience to the user. The Wabash expansion business systems, embracing letter files, card-index trays, document and catalogue files, &c., made up in sections, can be increased from a small beginning, either horizontally or vertically, to any extent. Briefly, the system is explained in these words: "Always complete, yet never finished." Wabash expansion bookcases, designed and worked on the same principle as the expansion business system, are also shown, as well as the Rem-Sho typewriter. The "Perfect" roller-copying bath, the "Racine" lever-press, roll-top desks, chairs and many other fittings complete the exhibit.

H. R. GRIFFIN & CO

The stand of Messrs. Hugh Reid Griffin & Co., of 1, Finsbury Square, E.C., in Bay No. 8, is a most interesting one. The hook joint for portable railways illustrated on this page is a very convenient one on broken land or very soft soil. The two hooks at one end of the frame are engaged behind the two pivots provided at the other side of the other end of the frame previously laid. Thus a strong joint is formed without bolting or fishing, preventing the separation of the single sections, even under heavy loads on the softest ground. The inclined plane or rising switch, also illustrated on this page, is undoubtedly of great use for branching off temporarily from a portable or permanent main line to a side track. The switch is placed direct on the track without it being necessary to take out any frame or section, and does not interrupt the main line. The wrought-iron turntable shown is most simple in action, and can be cleaned by simply lifting off the flat table plate, which works on rollers underneath. The all-round tipping waggon is a most useful contrivance, and is now well known. A rack brick-car is shown, fitted with roller bearings. These bearings have the advantage over ball-bearings that the pressure is distributed evenly all along the roller. Messrs. Griffin & Co. show Luther's tool grinder, an American invention just introduced into this country. This is made for working either by hand or by pedal. Luther's "Ideal" drilling attachment is also a most useful invention, being superior to the common breast-drill, as the pressure is given by a chain.


MESSRS. H. R. GRIFFIN & CO.'S INCLINED PLANE OR RISING SWITCH.


GRIFFIN'S HOOK JOINT.

MURAL AND DECORATIONS SYNDICATE, LTD.

Stand No. 6 in the Fire Prevention Section is occupied by the Mural and Decorations Syndicate, Ltd., of 13 and 14, New Burlington Place, Regent Street, W. The chief feature of this system is a wired lathing covered with cross-shaped pieces of terra-cotta burnt on at the joints. For walls, this material is stretched between iron rods, and is then plastered. A floor constructed by this syndicate was tested by the British Fire Prevention Committee about a year ago. The test lasted an hour and a quarter, and it was found that though various cracks developed in the plaster of the ceiling, no portion of the rendering fell. When water was applied, the plaster fell off when struck by the jet, exposing the lathing, but this latter remained intact and unaffected by the fire. After the test was concluded, it was determined that the ceiling should be re-plastered and the test renewed for one hour on a subsequent date; this was done, with the same results. This was the first continuation test made by the Committee to show the effect of fire on repaired work.

THE MOSAIC MANUFACTURING CO.

The floor space of this stand is covered with Roman marble mosaic and parquetry. Samples are shown of Venetian marble mosaic, with curved skirtings, and slabs for wall lining of this material. There are also a number of designs showing various floors recently executed, and sketch designs showing treatments for mural decoration in Venetian glass mosaic, of which there is a sample containing gold mosaic. The firm have recently taken up the manufacture of parquetry, of which far too little is used nowadays. The firm's catalogue gives some useful information about mosaics and parquetry, and a copy should be asked for. The address of the Mosaic Manufacturing Co. is 119, Pentonville Road, N., and the number of the stand is 51, Row B

LYTE'S METALLIC WOVEN STAIR TREAD CO., LTD., and BANNER SANITATION CO.

Stand Nos. 40 and 41, Row A, is a joint one for these two firms, whose address is 24, Craven Street, Strand, W.C. Lyte's metallic woven stair tread is formed of woven steel wire strands and lead. It is claimed that by the method of manufacturing this tread, the advantage of the non-slipping and noiseless lead surface is retained; while the disadvantages of rapid and uneven wear, of being pushed out of shape and forming projecting lumps on the edge of the stairs, usually associated with lead covered treads, are avoided.

The Banner Sanitation Co. show their well-known "Safe Guard" valve closets, drain stoppers for applying smoke tests to drains, and testers. A special feature is the manhole and cesspool covers, the surface of which can be fitted with a non-slipping surface of wood cubes or concrete or tar paving. The method of locking the manhole covers to the frames is ingenious, and avoids the danger of drain air passing through bolt holes, as in the ordinary style, by making the gunmetal screw bolts outside the seal.

JOSEPH HAMBLET.

Mr. Joseph Hamblet, Eagle Engineering Works, West Bromwich, occupies Bays Nos. 19 and 20. The machines made at his works are at present turning out in England alone about one thousand million bricks annually. One of his specialities is a brickmaking, pugging and grinding plant suitable for light clays, requiring only a little grinding. It is fitted with automatic winding apparatus. Another speciality is a powerful frictional-driven brick press, with which a pressure computed at about 100 to 120 tons can be given. It is particularly suitable for bricks that have to stand great pressures or are subjected to heavy wear, and the machine easily presses 4,000 bricks a day. Howl's patent brick and plastic drier, also to be seen at this stand, is operated by live or exhaust steam. The bricks are placed on hollow trays, through which the steam passes, no tunnels, fans or special machinery being needed.

WOOD CARVING CO., LTD.

The Wood Carving Co., Ltd., of Windsor Street, Birmingham, have a noteworthy stand in Row C, No. 71. This firm are showing their several specialities, such as the Saracenic twisted and turned mouldings, which are interlaced in Moorish style, and have been extensively fitted up in hotel and billiard rooms, smoke rooms, &c. These twisted mouldings have been largely used for screens of all kinds. Also a number of pressed and carved mouldings are exhibited, with carved-wood panels, newels, balusters, &c. Overdoors of every shape and kind are made by the Wood Carving Co.

JAMES WOODWARD, LTD.

Messrs. James Woodward, Ltd., of Swadlincote, at their stand in Row C, No. 79, have a large and varied exhibit of their well-known "Anchor brand" specialities, such as "Ewing's patent Xentric shoulder" socket pipe. This "fast stopper," burnt into the socket of the pipe, may be easily removed when the connection requires to be made to the sewer. It saves contractors the labour of cementing in the stoppers, and while in the whole length of sewer may be tested. "Ewing's Xentric" shoulder pipe No. 2 is for grouting in the joints in water-logged ground. A large photo is on exhibition of a long line of "Xentric" pipes laid at the drainage works, Great Ouseburn, Yorks. Woodward's "Archer" joint pipes are also worthy of notice. A good exhibit is the bottom of a manhole constructed of Freeman's white glazed blocks, which includes not only the channels for the various inlets, but the "benchings," so presenting a glazed surface to the sewage where hitherto rough cement work was usually worked in. A special feature is made of Woodward's glazed bricks in various art tints. One or two London terra-cotta garden vases containing beautiful palms add greatly to the attraction of the stand.

BANKS' FIREPROOF CONSTRUCTION SYNDICATE, LTD.

The exhibit of Messrs. Banks' Fireproof Construction Syndicate, Ltd., of 71, Queen Victoria Street, E.C., will be found at Stand No. 13, Row A. Bank's patent helical metal lathing is made of flat steel wire or ribbon, twisted and woven into meshes of convenient size. The advantages claimed for it are that the amount of metal used is the minimum consistent with the required strength, that its key is perfect and uniform under all circumstances of fixing, can be made of any required length or width, is not formed of iron sheets, which are liable to expansion and rust, and does not cut the hands. This lathing is used in Bank's method of fireproof construction for protecting the undersides of girders, joists, columns and stanchions with fireproof plastering. The method is also useful for protecting walls from damp and for partitions. A remarkable evidence of the strength of this wire lathing is afforded at the stand, great weights being supported on the thin woven strands. The lathing can be most advantageously used for embedding in concrete slabs, adding immensely to their strength. The advantage gained for Bank's lathing over sheet lathings is that, these latter, being of sheet metal must be of soft steel, whereas Bank's is made of hard steel of far higher strength, while the peculiarity of the key induces the plaster to cover the whole of the metal, thus securing it against rust and corrosion.

EXPRESS CONTRACT CO., LTD.

We are pleased to find the now familiar characters "N.A.P." still to the fore. The well-known specialities which enable casements, sliding-sashes, fanlights, &c., to be cleaned from inside the room with safety, are to be seen at Special Position No. 5, Row F. In addition there are several new specialities which are well worth the attention of all supporters of N.A.P., and which bear witness to the continued enterprise of the N.A.P. Window Company in connection with every detail or contrivance for adding to the efficiency of windows for every type of building. The number of windows fitted with N.A.P. specialities is legion, and comprise most of the leading hotels, hospitals, schools and public buildings which have been erected during the past few years. The fact that upwards of 10,000 N.A.P. windows have been fitted in schools throughout the United Kingdom is alone sufficient to justify their adoption, for if they are capable of standing the wear and tear of school conditions they will stand anything. The N.A.P. Window Company exhibited at the Paris Exhibition of 1900, and secured a medal and the highest award for windows. It is interesting also to note that these metal casements were used in the British Royal Pavilion. We hear that during last year some thousands of N.A.P. (inward and outward opening) metal casements were fixed in various buildings, including St. Gabriel's College, Camberwell (where 1,600 N.A.P. metal casements are in use). Other buildings for which N.A.P. window fittings have recently been supplied are the London Hospital; Kingsley Hotel; Abbess Grange, Hampshire; Southampton Hospital; Dorking Hospital; Victoria Hospital, Folkestone; Gifford House; Napier Barracks, Shorncliffe; and Princess Christian's Home, Pirbright. Address, 159, Victoria Street, S.W.

MATTHEWS & YATES, LTD.

Messrs. Matthews & Yates, Ltd., Cyclone Works, Swinton, Manchester, who exhibit at Stand No. 161, Wall Space, make a speciality of sawdust and shaving collection machinery. The small installation exhibited at this stand shows how refuse from wood-working machinery can be collected and deposited conveniently for consumption in steam boilers. The work is done by one of their blower-type fans, driven by an enclosed electro-motor of their own make, in conjunction with a "Cyclone" dust collector, the fan and the collector being connected by trunking. The fan is also used for assisting boilers with either forced or induced draught, not only for steamships, but also for land boilers in electric light stations, mills and various other buildings. Besides being makers of ventilating machinery, the firm have branched out into the electrical trade and are now putting motors and dynamos on the market. Their enclosed motor, of which they make a speciality, is guaranteed dust-, damp- and fireproof. Messrs. Matthews & Yates have installed their apparatus in many of the leading hotels, restaurants, post-offices, workshops and public buildings throughout the country. Their London showroom is at 84, Gray's Inn Road, W.C.

ACME WOOD FLOORING CO., LTD.

The Acme Wood Flooring Co., Ltd., occupy a large stand, Nos. 9 and 10, in the gallery. Here are exhibited specimens of wood-block flooring in maple, oak, pitch-pine, Jarrah, teak, Kauri pine, red gum, Swedish red wood—all laid on W. Duffy's "Immovable-Acme" principle. The object of this system is to prevent the loosening of the blocks. It consists of a method of dowelling by which the blocks are fixed securely to each other and the whole screwed to binding blocks secured in the foundation. The blocks are not weakened by this system. The exhibits are all laid in the firm's well-known "D" quality. With regard to street-paving, the Duffy method of laying the blocks affords a smooth level surface which increases the "life" of the pavement; this was shown in the case of the Tower Bridge, where the ordinary wood blocks had to be renewed, while the dowelled paving has been down for six years, and has every appearance of lasting many more years.

G. A. WILLIAMS & SON.

Stand 32 in the Fire Prevention Section is occupied by Messrs. G. A. Williams & Son, of 21, Queen's Road, Bayswater, W. The chief exhibit is the "Williams" fire-blind. It has over and over been proved in cases of fire that had certain openings in passages been protected or covered up, the spread of the flames would have been very greatly checked. In London alone during the past ten years there have been at least seven great fires which have proved disastrous through this defect. After the great Cripplegate fire of 1897 a special inquest was held by the City authorities, and a recommendation was made by some of the experts that it was advisable for all windows looking on to streets or light areas to be protected by a fireproof rolling blind, fixed outside the windows. The "Williams" blind fulfils the requirements. It is of asbestos, with pockets at the back to hold water, and in case of emergency can be let down in a few seconds without opening the window. It has an automatic attachment at its base to prevent flames being drawn up behind it, and is free from complicated parts. When subjected to the tests of the British Fire Prevention Committee, it effectually resisted the flames, which did not penetrate it, though the fire was a fierce one and was maintained for half an hour.

CRITTALL MANUFACTURING CO., LTD.

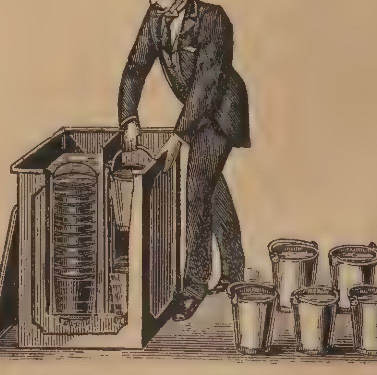
The "Safety" window casements are a prominent feature of the exhibit, on Stand No. 29 in the Fire Prevention Section, of the Crittall Manufacturing Co., Ltd., of Manor Works, Braintree, Essex. These may be of gunmetal, and have a double-hinge arrangement to enable the window to be reversed so that the outside may be cleaned with ease. The second hinge is in the centre of the frame, and can only be used after a sliding catch in the edge of the frame has been released. The fittings to these windows are of gun-metal and are well finished. The "Safety" casements have been used throughout the Record Office in Chancery Lane, at Liverpool Street Station, Liverpool Fire and Police Station, and by the late Sir Arthur Blomfield in Church House, Westminster, and the Royal College of Music.

HUNT & FAGE.

At Stand No. 39, Row A, an interesting exhibit is given of the scaffold fixer made by Messrs. Hunt & Fage, of 62, Malvern Road, Dalston, N.E. This device is undoubtedly a great saving in both labour and money on the ordinary system of fixing ledger braces or puncheon poles to standards with scaffold cords and wedges. It is simply and easily fixed to the poles by means of a chain and bolt, and is used with the ordinary poles. A very great feature in this labour-saving appliance is that in striking a scaffold the whole can easily be dismantled and let gently down to the ground by simply slacking out the chains, every pole being let down by its own gravity; thus accidents would be greatly diminished by its use. We must commend Messrs. Hunt & Fage for showing their invention in an unpretentious manner, using ordinary poles showing the action of the invention as in actual work.

MESSER & THORPE.

Messrs. Messer & Thorpe, of 8, Quality Court, Chancery Lane, W.C., show at their stand in Row F, No. 127, their patent bucket fire-extinguisher. This very valuable invention consists of a covered reservoir of water in which is submerged one or more nests of fire buckets, stored telescopically, as here illustrated. Ten, twenty, or thirty fire buckets full of water are thus always ready, and after each nest of ten has been withdrawn, five of the buckets can be refilled from the remaining water. The buckets are secured against sticking, and are withdrawn full of water. The cover of the tank prevents evaporation, and keeps it pure and free from freezing, as happens with exposed buckets. Water so protected may remain in the tank twelve months without being changed.



WALL-PAPER MANUFACTURERS, LTD.

The speciality of this firm is the "Salamander" fireproof ceiling decorations in relief. At the stand in Row B, Special Position No. 9, examples of pleasing design are shown of these well-known wall and ceiling decorations. The material is pressed out of a single sheet under great pressure, and the remarkable fact is that such a high relief as 4in. has been obtained beyond that attempted by other somewhat similar products. The sheets when fixed are painted or distempered to any required tints, and are cheap, clean and fireproof. The address of the firm is 158 and 160, Charing Cross Road, W.C.

PETRIFITE, LTD.

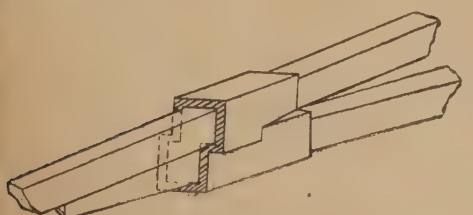
The exhibits at the stand of Messrs. Petrifite, Ltd., of 24, Finsbury Square, E.C., in Bay No. 4, consist of samples of the products of petrifite cement and petrifine, such as building stones, paving slabs, fire- and sound-proof partitions and flooring slabs, sawdust floorings and steps, pipes, utilisation of waste products, &c. From this tabulation it will be seen to what varied uses "Petrifite" lends itself, cementing as it does almost any material. A speciality of this firm is the petrifite road cement for road and street paving in place of asphalt, wood, granite, &c., its great advantage being that it sets quickly and will allow of traffic over it in a comparatively short space of time. "Petrifine Internal Cement" differs from all other internal cements, such as Keene's, Parian, &c., in having magnesium and not gypsum for its base. It works well by reason of its "fatness," and it has the great advantage that one coat can follow the other, so that the work can be commenced and finished in a day.

ST. PANCRAS IRONWORK CO., LTD.

The St. Pancras Ironwork Co., Ltd., of 171, St. Pancras Road, London, N.W., have their stand in Row B, No. 58. A model of their improved stable fittings and the prismatic and other pavement lights are especially noticeable. The glazed cellar flaps are a very great improvement over the old style ones, which are so heavy to lift; the patent systems of balance and cushions entirely does away with objections to the former kind. The prismatic window glazing is also of equal advantage, the form of the glass prisms deflecting the light in the best way. There are also on exhibition iron staircases, straight and spiral.

THE ASBESTOS AND ASBESTIC CO., LTD.

The Asbestos and Asbestic Co., Ltd., of 27, Billiter Buildings, Leadenhall Street, E.C., are showing at Stand No. 13, in the Fire Prevention Section samples of Danville asbestic fireproof plaster. Among other interesting exhibits here, one of great value to, and worthy of, the notice of builders and contractors is to be seen in Mr. F. M. Davids' patent scaffold attachment illustrated on this page. This is a very simple contrivance whereby all ties and split heads are done away with, and a secure elevation for the scaffolding of any height can be reached in less time than it takes to tie any two poles together. The simplicity of the arrangement is so surprising that it is a wonder that no such idea has ever struck a practical builder before. The claims for this invention are (1) easiness of fixture in that it can be fixed in less time than any two poles can be tied together, (2) adaptability to any elevation, (3) durability and safety, and (4) economy of time, labour and expense.



ASPINALL'S ENAMEL, LTD.

Messrs. Aspinall's Enamel, Ltd., of New Cross, S.E., have one of the best stands in the Exhibition in Row D, Special Position No. 10, consisting of a small villa model, decorated entirely with the specialities of the firm. Aspinall's enamel is too well known and widely used to need any description, but we may, perhaps, tabulate its special advantages: (1) Brilliant gloss and perfect surface, (2) easy flow and manipulation under the brush, (3) decreased cost of labour, (4) enormous covering properties, and (5) though usually supplied in the white, it may be tinted by ordinary stainers or made to match any pattern. All orders should specify if the enamel is required for *inside* or *outside* use, the distinguishing labels for which are marked respectively "*O*" and "*Indian.*"

THE NEW EXPANDED METAL CO., LTD.

This firm has stands in Row D (Special Position No. 7), and the Fire Prevention Section (No. 5). Expanded metal has now made such strides in gaining public favour that it would be needless for us to enlarge upon its advantages. The fine mesh lathing is chiefly used for plastering, and the mistake is easily made of getting too small a gauge to properly hold the plaster, which falls through the mesh and is wasted. The larger meshes are very useful in concrete flooring and adds immensely to the strength, as can be seen from the important and conclusive tests that have been carried out. The larger meshes are also used for fencing and enclosures of all kinds. The metal lathing is much used for protecting stanchions, girders, joists and columns against fire, and excellent results have been got under tests by the British Fire Prevention Committee. A novel use for the material is shown at the stands, namely, for waste paper and letter baskets made of Japanned expanded steel and polished and lacquered brass. A sand riddle of expanded metal is also shown. The address of the company is 39, Upper Thames Street, E.C.

CANDY & CO., LTD.

Messrs. Candy & Co., Ltd., at their stand in Row E, Special Position No. 4, are showing a varied assortment of granite vitrified paving, engineering, buff terra-cotta facing enamelled and glazed bricks, vitrified channelling and kerbing blocks, firebricks and tiles, terra-cotta, and stoneware pipes and fittings. A noteworthy speciality of this firm is the buff vitrified paving bricks, made solely from granitic clays. These bricks are stated to be rapidly replacing the vitrified blue brick and other pavings. They possess the advantages of being bright in appearance, are impervious, resist a crushing strain of 445 tons to the foot, are damp and frost proof and vitrified throughout. The bricks, channelling and kerbing blocks have been adopted by the War Office authorities; and on account of the sharp points of infusible silica contained in the granitic clays the paving does not become slippery in wear. For such work as stables we would recommend the bricks with longitudinal grooves, as they undoubtedly can be kept clean more easily than the herring-bone or other fancy patterns, and, after all, cleanliness is one of the first conditions of a stable. We would draw special attention to this firm's white and coloured glazed bricks. Owing to the clay these are made of their surface is not level, but rippled as it were, almost unnoticeable. This, however, far from being a disadvantage, gives a most pleasing effect, the light playing on the different angles of the surface and avoiding a deadly monotony. We noticed especially a brick enamelled a lovely dark green colour, that we would like to see employed largely; green is such a pleasing colour, and the shade made by Messrs. Candy & Co. is a grand one. The works of the firm are at Heathfield Station, near Newton Abbot, S. Devon.

CLOISONNÉ GLASS CO.

The exhibit of the Cloisonné Glass Co., of 66, Berners Street, Oxford Street, W., at Stand No. 63a, Row C, is one of the most artistic in the Hall. This new method of treatment adapts itself in a most wonderful way to all kinds of artistic treatment, giving a good opaque appearance, yet glittering and scintillating like the beautiful old stained-glass. Although the work is opaque, the light is not materially stopped. The method of obtaining this effect is by bending wire of various colours on a sheet of glass into cloisons, so as to form patterns, and filling these former up with powdered glass or beads of glass of various colours. The powdered, or beads of, glass are then fixed to the under sheet of glass by a solution which resists heat and moisture, and another sheet of glass is placed over to protect from dust. The treatment is one which can very well be substituted for leaded glass, so beloved by the architect for avoiding the ugliness of the large glass pane. Cloisonne glass has this advantage over leaded, that it can be cleaned easily, and has no leads on the surface to catch the dust. As evidence of the appreciation this glass is meeting with, the new royal yacht is to be fitted with a number of specially designed windows.

NON-FLAMMABLE WOOD AND FABRICS CO., LTD.

This firm, whose address is Townmead Road, Fulham, S.W., has its stand in the Fire Prevention Section, No. 33. "Non-flammable" wood is now well known and largely used, but the non-flammable fabrics are a somewhat new application of the method of treatment employed by this company. We have tested both wood and fabrics, and found not the slightest trace of flame. The advantages of such a method need no enlarging upon, and judging from the exhaustive official tests that have been carried out upon these materials, they should obtain a still larger vogue than they have at present, which is saying much. A new use to which the wood is being put is in building bungalows and half-timber and concrete villas, which will thus pass the requirements of the by-laws. For fireproof floors, furniture, partitions, ceilings, &c., the wood is highly estimable, and the fire insurance companies recognise its value in giving special terms where used.

WILLIAM MILLAR.

Mr. William Millar, the author of "Plastering, Plain and Decorative," is exhibiting his "Ornato" at Messrs. Potter & Co.'s stand in the Fire Prevention Section, Nos. 27 & 28, in connection with Potter's fireproof floor, being used as a decorative ceiling. "Ornato" is produced from a waste product, to which is added vegetable wool and fibre fabric, the whole forming a hard, tough, yet light substance of a fire-resisting and sanitary nature. It will reproduce the highest relief with all the fine details and undercut of carved wood and chased metal. It is readily fixed to any surface. No skilled labour is required for fixing, and it can be made in any desired size or form. Sign-boards made of this material are also shown in Messrs. Fred Jones & Co.'s stands in Row D, No. 86, and the Fire Prevention Section, No. 12; at the stand of Ripolen, Ltd., in Bay 3, and at the stand of the Asbestos and Asbestic Co., Ltd., in the Fire Prevention Section. Samples of Mr. Millar's modelled stucco and sgraffito are shown at Joseph Arnold's stand, in Row F, No. 124.

THE BUILDERS' JOURNAL.

As usual, the BUILDERS' JOURNAL AND ARCHITECTURAL RECORD occupies a stand at this Exhibition (No. 81, Row C). Here are displayed copies of our own periodical, and also of that finely-illustrated magazine "The Architectural Review," which is also published at these offices. "Specification," which is so highly esteemed by all architects, builders and engineers, is also exhibited. Our representatives will be happy to supply advertisers and readers with all information respecting the publications named.

C. D. MONNINGER.

Saw-sharpening machinery is the special feature of the exhibit of Mr. C. D. Monninger, St. Anna Saw and File Works, 124 and 126, Clerkenwell Road, London, E.C. The improved latest pattern "Climax" band-saw sharpening and setting machine is to be seen at work at his stand (No. 114, Row E). The improved saw-sharpening machine for circular saws and mill webs is also shown working. Much prominence is given to guards for dangerous machinery, the Couzens' patent automatic saw guard being shown fitted to Monninger's improved rising and falling top saw-bench. Another exhibit at this stall is the patent "Practical" moulding machine guard fitted on a latest pattern vertical-spindle moulding machine.

WATERPROOF CEMENT CO.

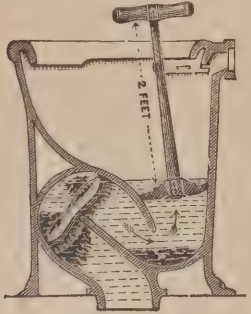
Waterproof cement is a material as yet imperfectly known on the English market. It is exhibited at the stand (No. 137, Row F) of the Waterproof Cement Company, who have works at Brentford and offices at 6, Millbank Street, Westminster, S.W. Portland cement mixed with this composition becomes impermeable to water. The material is used under ordinary conditions, no heat being required for mixing. It takes paint readily, and can, if desired, be faced with ordinary Portland cement. Samples will be forwarded on application, and the company will be pleased if these be submitted to any practical tests that may suggest themselves.

Samples are also exhibited on this stand of the "Standard" damp-proof composition. With a lining of this material properly applied, a guarantee is given that no house or place will show evidence of damp. It is applied in a molten state, and sets quickly. Its price is £5 5s. per ton, free on rail, lesser quantities at 6s. 6d. per cwt.

GEORGE PRICE, LTD.

The "Twentieth Century" bent steel side-locking safe is to be seen at the stand (No. 16 in the Fire Prevention Section) of Messrs. George Price, Ltd., of Wolverhampton. The outer shell is bent cold by powerful hydraulic machinery out of a single steel plate, from ¼in. to ½in. thick, so that the corners are solid and jointless. Doors are of ⅝in. to 1in. solid steel, and are secured at the back by a continuous bar, which, when the door is closed, passes behind the solid web of the T-section door frame. The safe is locked automatically without applying the key to the lock. The "Twentieth Century" strong-room door can also be inspected at this stand. The firm has been established for more than fifty years, and has supplied safes to H.M. Board of Works, War Office, Admiralty, Bank of England, foreign Governments, and numerous large companies.

A. T. COOPER.



Mr. A. T. Cooper, of 92, Moray Road, Finsbury Park, London, N.W., is the inventor and patentee of the patent suction and vacuum pump illustrated herewith. The London School Board have 100 of these drain clearers in use, while the Commissioners of H.M. Prisons have provided the whole of their prisons with them. The exhibit at this stand (No. 32, Row A) also includes Cooper & Bryant's patent "Clincher Lock of the Future."

MELDRUM BROTHERS, LTD.

The exhibits of Messrs. Meldrum Brothers, Limited, of Atlantic Works, City Road, Manchester, will be found at Stand No. 109, Row E. The specialities exhibited are the "Meldrum" forced draught furnace, the "Koker" stoker combined with forced draught, and a model of Meldrum's patent refuse destructor. The "Meldrum" forced draught furnace is suitable for all types of steam boilers. The "Koker" stoker combined with forced draught is adapted for mechanical feeding on the coking principle, and the combination gives results claimed to be in advance of any other mechanical stoker, especially as regards high boiler duty, fuel efficiency, and smokelessness. Refuse destructors are now being erected by this firm for numerous cities and towns in England and Scotland, besides which there are a good number already at work. The temperatures maintained in the Meldrum's destructors ensure the thorough cremation of the fumes, &c., while the higher steaming power from the refuse can be used for electric lighting, sewage pumping, or other useful municipal purpose.

THE STONEHOUSE WORKS CO.

The Stonehouse Works Company (Stand No. 154, Wall Space) is the engineering business of Mr. Edward Tailby, timber merchant and general woodware manufacturer, of 76, Summer Row, Birmingham. Several saw benches are to be seen at this stand. The improved patent high-speed saw bench arranged for cutting and ripping deals and battens is exhibited: its patent radial arm (which can be fitted to any existing make of saw bench) enables work to be executed with very great rapidity. The machine is also provided with a patent pressure attachment and saw guard. In the patent self-acting cross-cut saw bench the wood is placed on the table against the fence, and the stop set at the length required, and by the simple movement of the lever the saw travels, cross-cuts, and returns to its position in four seconds, thus enabling a deal about 14ft. long to be cross-cut into six pieces in less than half a minute. Other saw benches and machines are also to be seen at this stand.

WALTER J. PEARCE, LTD.

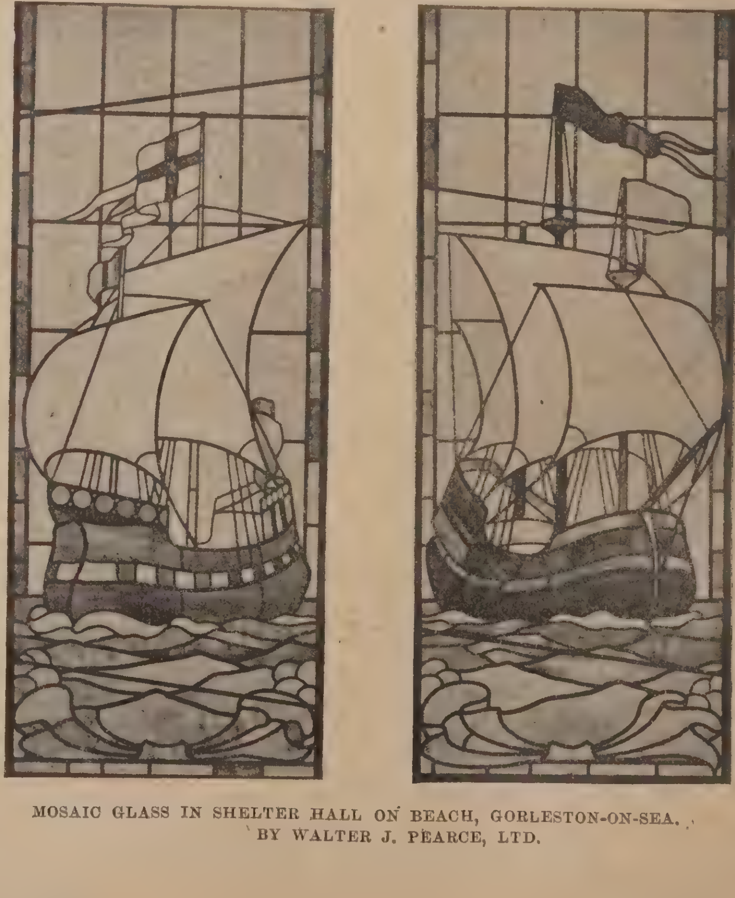
One of the most attractive stands in the Exhibition is that of Messrs. Walter J. Pearce, Ltd., of 41, Gartside Street, and Hardman Street, Deansgate, Manchester. It occupies Special Position No. 1, Row A, and is in the form of a truncated pyramid or Greek pylon, 20ft. high, the wood framing being stained a dull green colour, and the spaces filled with very pleasing specimens of stained-glass work. Mr. Pearce, who is an expert draughtsman, and executes his own designs, makes a speciality of the purely conventional treatment of lead and glass. He is an authority on decoration, and the author of "Painting and Decorating," which is the recognised text-book of the City and Guilds Institute for decorative students. As a colourist he is very skilful. The work shown at this stand includes specimens of glass now being fixed at the new municipal technical school at Manchester, the largest building of its kind in the country; here 15,000ft. of ornamental leaded lights are being used. Other specimens shown are the ceiling lights for the new police courts at Halifax, glass to be placed in several churches, and panels as being used in numerous large mansions in Lancashire, Cheshire, Yorkshire, Leicestershire, on the Thames, and other places. Mr. Pearce's style is distinctly modern and the outcome of a close study of the best method of using lead and glass together. We illustrate two of the designs above.

W. & C. JOHNSON.

Stand No. 87, Row D, is occupied by Messrs. W. & C. Johnson, mahogany and timber merchants, of 118, Hoxton Street, N.E. A stock of mahogany boards is kept, varying from 8in. wide to 24in. wide, the latter being generally needed for counter tops and facias. They are now importing large quantities of Honduras and Nicaragua mahogany in dry boards, square edged, of prime quality. Of other woods, American oak can be had in any size, and at docks and mills the firm have a good selection of logs of American black walnut from 15in. to 30in. wide, which can be sawn to customers' requirements, and also a stock of boards and planks in this wood. American white wood is being more extensively used every year for joinery. It is mild in texture and easily worked, and is imported in square-edged boards and planks fit for immediate use. Teak, birch, Kauri and other pines, Sequoia, and other woods can also be supplied in any quantity by Messrs. Johnson.

SHANKS & CO., LTD.

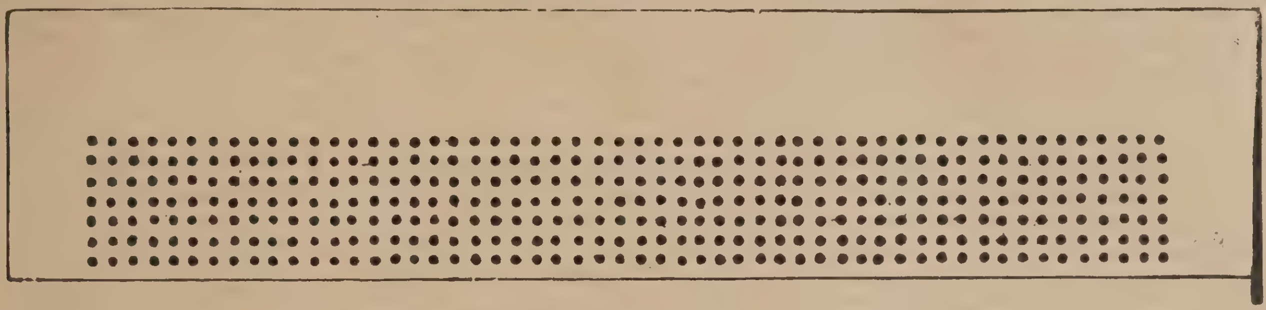
Messrs. Shanks & Co., Ltd., 81, New Bond Street, W., always have an attractive exhibit at the Building Trades' Exhibition, and that now shown at Bay No. 1 is certainly as good as those of any former years. Perhaps the chief exhibit is a handsome needle-spray-bath, which fits *inside* the rim, and cannot therefore harbour dust in any way, as all parts of it can be readily cleansed. It has a top shower and is fitted with all the latest conveniences. "The Perfecto," "Modern," "Fin-de-Siècle," and "Times" baths are also shown. These are excellently finished, the "Perfecto" having a syphonic overflow. One has only to look at an exhibit of this kind to appreciate the great improvement which has been effected in the matter of baths and bathroom fittings, the ingenious taps and outlets provided, and the handsome way in which all enamel work is finished; everything looks so perfectly clean and sanitary, which is of course greatly to be desired in all articles appurtenant to the bath. Messrs. Shanks also exhibit solid porcelain baths, patent new fireclay lavatories, closets, urinals, and sinks, all possessing the same high-class finish. The firm has already so good a reputation as to ensure every visitor to the Exhibition paying special attention to this stand.



MOSAIC GLASS IN SHELTER HALL ON BEACH, GORLESTON-ON-SEA. BY WALTER J. PEARCE, LTD.

B. WARD & CO., LTD.

Messrs. B. Ward & Co., Ltd., of 38 and 39, Parliament Street, S.W. (who exhibit at Stand No. 113, Row E), are concrete specialists and the sole proprietors of Charteris & Longley's patent system of laying wood-block floors. Specimens of this flooring in different woods—in Kauri pine, oak, walnut, teak, jarrah, maple and pitch-pine—are exhibited: one excellent specimen being executed in pitch-pine with a border of oak between thin lines of jarrah. A speciality exhibited at this stand is Ward's artificial stone-leaded stair treads, as being used in Mr. Bentley's new cathedral at Westminster. These treads are very pleasing in appearance, and very effective in giving a good foothold. In constructing these steps a lead grid is laid near the nosing, and the material is then built up around it till level with the tops of the dots which extend in seven rows across the tread; when set, all is rubbed down to a smooth surface. The lead cannot work out, and is pleasant to walk upon. Messrs. Ward & Co. deal very largely in artificial stone mantels, cornice strings, window heads, &c., and have executed work in various large buildings throughout the country. They have also laid a great amount of marble mosaic, tile work and cement flooring. Mr. Norman Shaw was greatly pleased with the manner in which they executed the principal stairs at New Scotland Yard.



WARD'S PATENT STONE-LEADED STAIR TREAD : PLAN SHOWING LEAD DOTS.

FLEMING, BIRKBY & GOODALL, LIMITED.

The "Teon" belting made by Messrs. Fleming, Birkby & Goodall, Limited, of Halifax, may be examined at their stand. This belting has been put to several tests, and has proved itself a good article. It is a most suitable belt for trying positions, or in countries where adverse and extreme climatic influences prevail, "Teon" being absolutely unaffected by the rays of the hottest sun, the most humid or steamy atmosphere, or the keenest frost, no matter how constant or interchangeable any of these conditions may be. Tests prove the ability of the belt to resist the action of dry heat up to 230 degs. Fahr., steam up to 200 degs. Fahr., damp, water and open air exposure; also oil, grease, alkalies and acids (with the exception in the last-named of bi-sulphide of carbon and chloride of sulphur). The basis of "Teon" is a specially-woven fabric, made up without joint or seam, thus securing perfect uniformity and evenness of driving. This cloth is built up in piles, then cemented together under enormous pressure. The cement is a secret preparation, and is the prime factor in enabling the belt to resist influences potentially deleterious in their nature. No ingredient used in this cement is influenced by any heat under 230 degs. Fahr.; and even at a higher temperature the cement is equally efficacious in its adhering power, and the "life" of the belt is in no way impaired. Every belt is moreover passed through a specially-devised stretching apparatus, so that practically all "stretch" is taken out, and the total result is a sound, reliable, and high-grade belt.

THE TERRA-COTTA HOME ARTS.

In the Gallery, Bay No. 27, will be found examples of work in terra-cotta, made under the direction of Mrs. G. F. Watts, at Compton, Surrey, by the village children. We cannot commend too highly the lovely effect obtained by the use of natural clays by those who take a pleasure in their work—the true principle for all art work. To compare this work with the ordinary commercial terra-cotta would be absurd. The sun dials and garden vases are all from designs by Mrs. Watts, whose powers as a highly gifted designer are so well known. We understand that the small village chapel at Compton, carried out under the direction of Mr. G. F. Watts, R.A., and his wife, in this terra-cotta work, is now practically completed, and forms a wonderfully interesting work. At the stand is also shown a pair of small wrought-iron gates for this chapel, made from Mrs. Watts's design by the village blacksmith, unskilled to ornamental metal work, and this fact, while adding to the interest, by the want of finish undoubtedly detracts from the beauty of its design.

THE BRITISH COMPOBOARD CO.

A most interesting exhibit will be found at a stand in Bay No. 10. "Compoboard" is made of wooden slats 4ft. long and 1in. wide joined in an endless web, so that the 4ft. length of the slat forms the width of the complete board. Therefore, in a long board, say 4ft. by 9ft., the end grain of the wood is on the longer edge; in small pieces the end-grain edge is readily detected by the fact that it shows the joining of the slats inch by inch. The board should always be joined on the end-grain edge, with as tight a joint as possible. "Compoboard" will not shrink or swell, except very slightly on the loose edge, and when the joints are stopped can be painted, papered or distempered. It is made 4ft. wide, and in all lengths at 1ft. intervals up to 18ft. "Compoboard" is cheaper, and quicker to put up and cover, than lath and plaster, and avoids all the trouble experienced in using plastering, and needs no waiting for drying weather. It can be understood how great an advantage this material is in allowing of paint, stain, graining, distemper or paper being put on immediately after fixing, and with "compoboard" ceilings there is no cracking or falling down. It can be nailed or screwed, and cut with an ordinary hand-saw. At the stand will be found examples of the use of "compoboard"; the panels formed by covering the joints with mouldings are most pleasing. In the gallery will be found an office made of this material, fitted between wood-framing in imitation of half-timbering, of a very pleasing nature. The address of the British Compobaard Co. is 18, Roscoe Street, Golden Lane, E.C.

MARK FAWCETT & CO.

Stand No. 167, Wall Space, is occupied by Messrs. Mark Fawcett & Co., of 50, Queen Anne's Gate, Westminster, S.W. The "Fawcett" fireproof floor is so well known that there is no need for us to describe it at any length now; suffice to say that it consists, briefly, in the employment of hollow earthenware lintels (which provide air-space both longitudinally and transversely) fitting between the joists and having a dovetail key for the plaster of the ceiling below; the whole of the upper portion being filled in with concrete. The lintels are so shaped that allowance is made for the expansion of the joists, and the ventilation is very thoroughly effected. The floor is thoroughly fireproof, sanitary, light, strong, cheap, and easily constructed. It was fully described and illustrated in our issue for June 7th, 1899. Fawcett floors have been largely adopted by the Government and by the leading architects, both in this country and abroad. Another speciality to be seen at this stand is the "Fawcett" system of wood-block flooring. It is hardly necessary to emphasise the necessity for a floor to be perfectly even, and for it to remain so. In the "Fawcett" system this is accomplished by holding the blocks together by means of a steel tongue $\frac{3}{4}$in. wide and $\frac{1}{16}$in. thick, which fits in grooves cut in the sides of the blocks. It is true that the system is only applicable to the herring-bone pattern, but Messrs. Fawcett find this little drawback, as they have ascertained that 90 per cent. of wood-block floors are laid according to this pattern, and they do not mind leaving the remaining 10 per cent. of work in varied patterns to be executed by those whose systems allow this. Special attention should be called to the fact that the firm specify exactly what quality finish will be given in each case, a most important matter. For instance, their first-quality deal and pitch-pine blocks are *entirely* free from knots on face, and the wood is cut-rift grain; while the second quality is free from shakes, blue sap or knots larger than a halfpenny on face. With a guarantee of this kind one knows exactly what will be obtained, and not find that blocks vaguely described as of "best quality" are full of shakes and knots.

PILKINGTON BROTHERS, LTD.

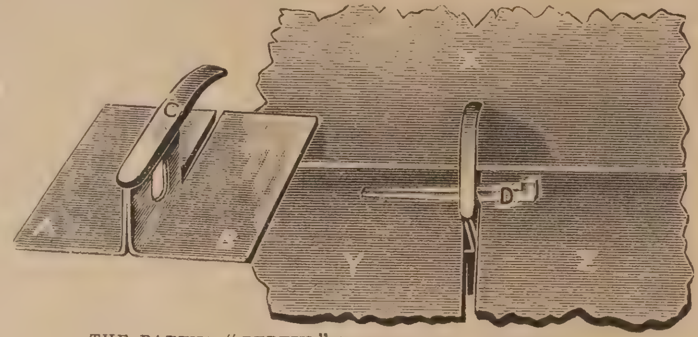
Messrs. Pilkington Brothers, Ltd., of 10, Upper Thames Street, E.C., exhibit their patent wired rolled glass at Stand No. 10 in the Fire Prevention Section. This glass has now been before the public in this country for about three years, and is being increasingly used. One great advantage is that, while in the case of a fire in a building glazed with wired rolled glass the fire can be seen, it is kept confined where it breaks out until the usual extinguishing appliances can be brought to bear on it. This glass is rolled plate glass, in the centre of which wire netting of about 1in. mesh is embedded; and the wire, being thus hermetically sealed up, cannot rust. The wire and glass combine so effectually that if the glass be broken the pieces do not fall out, but the surface remains practically intact, and in the case of fire offers the same resistance to its passage as before. In a recent instance in which it was severely tested, the glass in a skylight bulged inwards by the heat held the water poured upon it until the water boiled away, showing conclusively that the glass, though cracked and stretched, maintained a watertight surface. Fixed in a suitable non-combustible frame, it is an effectual barrier to the passage of fire.

NEWTON CHAMBERS & CO., LTD.

In Wall Space, No. 149, will be found the exhibit of Messrs. Newton Chambers & Co., Ltd., of Thorncliffe Iron Works, near Sheffield, and 16, Great George Street, Westminster, S.W., who are showing their "Thorncliffe Acme of Perfection" cooking apparatus, a patent close and open fire cookery range, having four ovens, all of which can be removed for examination or repair of flues without disturbing the fronts; each oven may be worked independently of the others, and all are perfectly under control. It is also fitted with a boiler for the supply of steam to cooking pans and a vegetable cooker, and could be supplied with a boiler for bath circulation. There are also shown the "Leamington" close and open fire cooking range with tiled coverings, slag-wool lined doors, and lifting bottom grate; the "Yorkshire" improved close and open fire cooking range with high and low oven and circulating boiler; a new independent grill stove, with cast-iron moulded front, inlaid with tiles, tiled panels at ends, and sheet-iron hot closet over grill; a steam closet for standing against wall with copper dishes and covers, Bain Marie, bottom shelf hollow for steam, fitted steam connections, and for condensation; steam vegetable cooker, with three compartments; and the "Thorncliffe" range, "No. 220, S.B.," fitted with oven heated by gas at the bottom, and oven for coal fire at the top, with hot plate. At this stand are also steam pans, stable fittings, garden rollers, radiators, independent cooking stoves, garden furniture, &c.

PRYKE & PALMER.

Messrs. Pryke & Palmer, whose offices are at 47 and 48, Upper Thames Street, E.C., have their stand in Row F, No. 123; and among a number of interesting exhibits shown, there is the patent "Perfik" roof-slate fastener shown by the accompanying illustration. For repairs to slate roofs, this is intended to supersede the old-fashioned lead or zinc strips. Its particular advantages are that one fastener binds three slates, that it will not shift by wind or sliding snow, holds the bottom edge of slate down, is scarcely perceptible on a roof, and will not catch or tear workmen's clothes. In fixing the fastener, the damaged slate is first removed, and replaced with a new one, as at X in illustration. The flanges A B of strap are shipped under the old slates Y Z, the part C standing up between. The strap is then pushed upwards until the notch in part C retains the bottom edge of the new slate X. The wedge D is inserted into the hole in fastener, and driven until sufficiently wedged to secure the slate from slipping. Another novelty shown is Fullerton's patent metallic connections for w.c. pans, in lead or brass, with short or long arm connectors.



THE PATENT "PERFIK" ROOF-SLATE FASTENER.

EWART & SON, LTD.

Messrs. Ewart & Son, Ltd., of 346, 348, and 350, Euston Road, London, show at their stand Nos. 20, 21, and 22, Row A, the "Lightning" geyser, for supplying hot water, in seven sizes; the "Champion" geyser, in five sizes, for positions where no head of water is to be had; the "Surprise" geyser, in four sizes and two patterns, for positions where good water pressure can be had; the "Califont" for delivering hot water to all parts of the house; the "Acme" geyser, with Bunsen burner; the "Success" geyser for oil; the "Royal" geyser, which is very cheap and rapid in action; and the "National" geyser. The firm also show their "Agate" porcelain enamel baths, and a novel and useful device, a bath seat, made to suspend from the sides of the bath by wire hooks. Various other bath-room fittings are shown.

M. T. MEDWAY.

Mr. M. T. Medway, the well-known lift, hoist and crane manufacturer, of Albert Works, Rolt Street, Deptford, S.E., shows at his stand, No. 56, Row B, a hand-power self-sustaining dinner lift, and an electric lift, both in working order. The self-sustaining action for any weight is a very important advantage in connection with Mr. Medway's lifts, and, in connection with his hydraulic lifts, the patent hydraulic starting valves should be especially taken note of.

THE GLENFIELD PREMIER BRICK AND TERRA-COTTA CO., LTD.

This firm, whose address is Glenfield, near Leicester, on its stand in Row F, No. 130, show samples of red bricks, hand-pressed facing bricks, tapped wire-cuts for seconds facing and moulded and ornamental bricks of all kinds. Terra-cotta chimney pots, ridge tiles and finials are also shown made of a special clay which allows of these articles being turned out very true, not warped as too often happens with terra-cotta, and is such a very great defect. Yet, notwithstanding the trueness, the terra-cotta has been well burnt and not "biscuited" to avoid the warping under high temperatures.

THE DELTA METAL CO., LTD.

The malleable bronze alloys manufactured by the Delta Metal Co., Ltd., of 110, Cannon Street, E.C., which has its stand at No. 53, Row B, more particularly "Delta metal No. I. and No. IV.," possess not only very great strength and toughness, but also a remarkably high resistance to corrosion. In all cases where iron and steel are unsuitable owing to their rapid deterioration, and where the use of gunmetal and bronze cannot be allowed on account of insufficient strength, "Delta" alloys will be found most reliable, durable and economical. "Delta metal Nos. I. and IV." can be forged at a dull red heat, and are most useful as materials for repairs. The specialities shown at this stand are angles, tees, joists and special-shaped section bars for use in the construction of window frames, casements, &c., and "Dick's patent extended stair treads, nosings and carpet plates" in "Delta metal," brass, &c.; these latter have a corrugated surface to give a good foothold.

FIREPROOF PARTITION SYNDICATE, LTD.

The Fireproof Partition Syndicate, Limited, of 10, York Buildings, Adelphi, W.C., exhibit at Row B, Stand 48, a two-roomed "week-end" bungalow composed of their patent dovetail corrugated metal-sheeting, while a gate-keeper's office is exhibited in the fire-proofing section. The sheets are formed by patent machinery into dovetail grooves, which form an excellent double key for any kind of plastic material, thus rendering them solid, fire-, sound-, damp-, and vermin-proof walls only 2in. thick. The sheet being without perforations, there is no waste of plaster, or any fear in case of fire of flames passing through after the plaster has fallen away from intense heat. The roofs of the buildings shown are also made with the patent sheeting, plastered, with tiles embedded. The saving in space in a building where these partitions are used means a nett gain of 4in. on each partition. One partition saves 4in.; two, 8in.; three, 12in.: thus, with three partitions, saving 1 cubic foot through the entire building, as the 2in. partitions are equal in strength to a studding partition 6in. thick. The firm also show samples of patent fireproof floors, constructed on a similar principle. They can be both cheaply and speedily erected, and can be plastered immediately if required, while it is claimed that the weight per foot super. is considerably less than that of any other fireproof floor on the market to-day.

J. OATES.

The exhibit at Stand 31, Row A, consists of a number of "Empire" patent wallpaper trimming machines made by Mr. J. Oates, of 24 George Street, Huddersfield. These are shown in operation, edging all kinds of wallpapers, from common pulps, grounds, and sanitaries, &c., up to Anaglypta; and that so expeditiously and a the same time so accurately, that visitors cannot help being struck with the great difference between the results obtained by the use of this neat little labour-saving machine and the old-fashioned, slow, and tedious method of work with hand scissors; indeed, the latter method must finally become a thing of the past, as an ever-increasing number of these wallpaper trimmers are being used throughout the Kingdom and abroad. The 1901 model shown at this stand embodies the very latest improvements in trimming machines.

MOFFATT & EASTMEAD, LTD.

Moffatt & Eastmead, Ltd., lift manufacturers, of 39, Victoria Street, S.W., occupy Bay No. 5. Here may be seen an electrically-driven warehouse lift, a patent self-sustaining hand-power goods and dinner lifts, a belt-driven dispatch sack hoist for granaries, breweries, stores, barrow hoisting, &c., and a self-sustaining hoisting crab which dispenses with both brake and ratchet, and will not allow the handle to fly back. The warehouse lift and sack hoist are shown working, and are driven by a 3-h.p. electric motor supplied by the General Electric Company, Limited. Another exhibit is one of Moffatt's improved 1900 patent feed-water heaters and fuel economisers for steam boilers.

In designing their hydraulic lifts Messrs. Moffatt & Eastmead's main object has been to secure safety and economy. The former has been attained from results gained in actual practice, and the latter by reducing the number of parts to a minimum, retaining only those necessary to efficient working.

L. LEWIS & Co.

Messrs. L. Lewis & Co., of 51, Shirland Road, Paddington, W., are the manufacturers of the flexible damp-course, patent mastic roofing felt and slaters' felt to be seen at Stand No. 17, Row A. The damp-course is manufactured by a chemical process, and is not liable to crack or ooze out under pressure. It is manufactured in lengths of 33ft. (widths to order), thus having an advantage over 32in. slabs and saving from 25 to 30 per cent. in material and labour. The flexible mastic roofing felt is manufactured on the same principle as the damp-course. Messrs. Lewis claim that this felt is much superior to the ordinary straw or fibrous felt, both in strength and durability. The mastic slaters' felt is manufactured on the same principle as the roofing felt, but is thinner in substance. The price of the mastic damp-course, extra quality, 9in. wide, is 4d. per lineal yd. in rolls of 11yds. The roofing felt costs 5s. 6d. per roll of 11yds. by 39½in. wide (contents about 108ft. super.). The slaters' felt, 11 or 22yds. long, 39½in. wide, costs 3s. and 6s. respectively (contents of rolls about 108 and 216 super. ft.). These goods have been supplied to the War Office, Admiralty, General Post Office and other Government offices.

T. FEWSTER WILKINSON.

Mr. T. Fewster Wilkinson feels that as the present form of stairs has been in universal use since very ancient times (possibly since the Pyramids of Egypt were built) there will be a good deal of inherited prejudice to overcome in the adoption of his own patent stairs. These are designed to combine easier risers with wider treads than can be arranged on the ordinary system, and instead of being level across the whole width of the stairs the treads alternate to the right and left. Handrails at each side guide the person in the centre of the staircase, and he places his left foot on the left-hand steps. Mr. Wilkinson's address is Bartle Garth, Reepham-by-Lincoln, and his stand No. 29, Row A.

JULIUS HÜLSEN & CO.

Messrs. Julius Hülsen & Co., of Newcastle-on-Tyne, in their exhibit, demonstrate the efficiency of their precipitated carbonate of barytes as a preventative against scum and discolouration in facing bricks, terra-cotta, ridges, quarries, &c. Specimens are shown from the same seam of clay, partly with and partly without an admixture of the carbonate of barytes. Those made without the barytes are scummed, whilst those with which the barytes has been mixed are quite clean and of a good colour. "Linkum" Patent Belting is also exhibited at this stall. This is a belting made up of links punched from manufactured sheets of specially-prepared and highly-compressed fibre. Being made in this way, every link is as strong as its fellow; and as it is claimed that a "Linkum" link is of considerably greater tensile strength than the best leather link of the same section, the belt is very serviceable.

STANLEY BROTHERS, LIMITED.

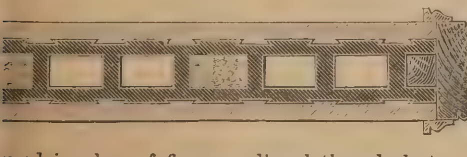
Messrs. Stanley Brothers, Limited, of Nuneaton, have the following exhibits on their stand:—White and coloured enamelled bricks; improved salt and grey granite bricks, for Board schools, hospitals and public buildings; red and buff chimney pots; brown and glazed cane sinks; ornamental red and buff terra-cotta; glazed socket pipes and connections; semi-encaustic paving tiles; blue pressed bricks, garden tiles, &c.; red ridge tiles, finials, ventilating bricks, &c.; red and buff terra-cotta and glazed vases; roofing tiles, malt kiln tiles; Staffordshire quarries, ridges, &c. This firm has branch works at Burslem and Willenhall, near Coventry, and collieries at Nuneaton and Bedworth.

JOHN P. WHITE.

As a maker of beautiful mantelpieces and garden furniture Mr. John P. White, of the Phyghtle Works, Bedford, occupies a prominent place in this country. The exhibits at his stand (No. 68, Row C) are fine specimens of design and workmanship. It is sufficient to mention that he has work from the hands of such men as Mr. H. Wilson, Mr. C. H. Quinnell, Mr. G. M. Elwood, to draw attention to his exhibit. A mantel by Mr. Wilson is to be seen at this stand. It is in oak with coromandel inlay. Mr. White's garden seats and gates have none of that foolish gewgaw which passes under the name of "ornament," but show a quiet restraint in design which is most desirable for all articles associated with a garden. The "Phyghtle" garden seat (by Mr. Quinnell) is particularly happy in treatment. In his new catalogue of garden furniture, Mr. White says: "The good results produced by my garden seat and gate catalogues, and the recent development in the craft of gradening, have suggested to me that there must be many gentlemen—members of the architectural profession and others—who are anxious to obtain some modern representations of the various quaint conceits and devices which contribute so much to the charm of the Old English Garden." And in this, with the assistance of Messrs. Forsyth & Maule, Mr. Quinnell, and Mr. James S. Cooper, architects, Mr. White has certainly succeeded. We would call special attention to the manner in which these catalogues are produced; they are well printed on good paper, and are illustrated by line drawings of very considerable merit. Roberts' drawing-board rest, fixed by four screws, is also to be seen at this stand.

SHEPWOOD & COMPANY.

The "Shepwood" patent partition brick, made by Messrs. Shepwood & Company, of Lindisfarne, Walton-on-Thames, can be inspected in the Fire Prevention Section of the Exhibition. It has hollow spaces passing vertically through it, so arranged that when the bricks are placed over one another with bonded joints the spaces are continuous. It is claimed that a partition constructed with these bricks, finishing 2½in. thick, is as rigid as an ordinary 4½in. wall; it will support itself across a wide span, and may be used in place of fire-spreading lath-and-plaster partitions, and for closet and lavatory divisions, articles and dormitory partitions, where space is valuable. The size of the bricks is 13½in. by 6in. by 1⅞in. thick. No ironwork is used in construction. These bricks have been used in numerous important buildings, such as the North-Eastern, St. George's, and St. Thomas's Hospitals; the Stock Exchange; Bank of Scotland, Bishopsgate Street; Victoria Theatre, Manchester; and Pitman Schools, Southampton Row.



S. T. CLOTHIER.

Mr. S. T. Clothier, quarry owner and stone merchant, of Street, Somerset, exhibits at Stand No. 34, Row A, flags, steps, and kerbs of Keinton stone, a very fine-grained blue-greystone. Flags and kerbs of this stone are very suitable for public footpaths, and are in use throughout the Midlands and South of England for this purpose. The rubbed flags for paving public buildings of all kinds have been used in the Royal Courts of Justice, Strand; and for tennis and racquet courts at Princes' Club, Knightsbridge, the University Club, Cambridge, Sir A. Noble's, &c. Their price is 1s. per ft. cube at the quarries, which are at Keinton, Somerton, and Street, in Somersetshire.

Blue and grey blocks are also shown of forest stone, a fine grained blue and grey sandstone, suitable for steps, landings, monumental and general architectural purposes, in general use throughout the Midlands and South of England. The price of this stone is 2s. per ft. cube at the quarries, which are at Knockley, Darkhill and Gosty Knoll, Forest of Dean, Gloucestershire.

HOULDSWORTH'S PATENT BARROW COMPANY.

The exhibits of Messrs. Houldsworth's Patent Barrow Company, of Park Lane, Keighley, at their stand in a Gallery bay, consist of barrows and barrow fittings. One of the great faults in ordinary barrow wheels is the constant repair necessitated by the failure of the axles. In Houldsworth's patent wheel it is claimed that this is entirely obviated by making the axle of the wheel really of two-flanged axles of steel bolted through the stays, which are of wood, and form a cushion to the axle. As the axles work in patent Bush bearings, the liability to get out of order is reduced to a minimum. The wheel is stated to always run true and to outlast several of the usual make. The Bush bearings referred to are driven in with a hammer into the usual hole bored in the axle block. Barrows can be fitted with patent adjustable bearings if required.

H. C. SLINGSBY.

The patent trucks made by H. C. Slingsby, of 142, 144, 146, Old Street, E.C., where there are 20,000 sq. ft. of show-rooms, are too well known to need much description. They are obtainable in various sizes for all trades, run both ways, spin like a top, and have a sliding wheel at each end. A number of these trucks are shown—being a selection from 400 styles and sizes listed, and 1,000 styles and sizes to be seen—at 142, 144, 146, Old Street, E.C., which is the new address of the firm. The offices, were formerly at 30, Gray's Inn Road, E.C. Mr. Slingsby's exhibit occupies Wall Space 157.

CROSSLEY BROTHERS, LIMITED.

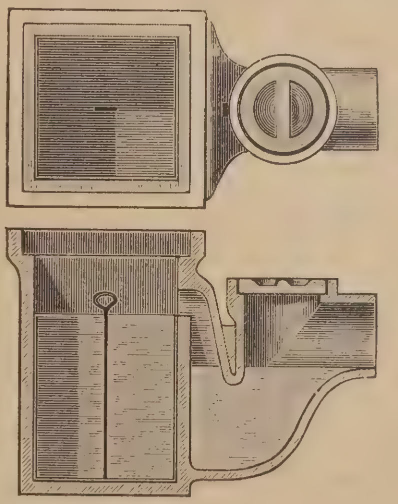
The exhibit of Messrs. Crossley Bros., Limited, of 10, St. Bride Street, E.C., in Wall Space No. 124, consists of the following engines: One type "U" gas engine of the latest pattern, capable of developing 33 effective h.p. as a constant working load. One type "OE" high-speed electric lighting gas engine fitted with one specially heavy fly-wheel, supported by outside bearing. This engine is capable of developing 12½ brake h.p. as a constant working load, and is used for driving a dynamo for lighting this stand. A perfectly steady light can be obtained with this type of engine, without accumulators. One type "JJ" oil engine, capable of developing 1½ brake h.p. as a constant working load. The "U" type above referred to drive the brick-making machinery on the adjacent stand of Messrs. Thomas C. Fawcett, Limited, engineers, of Hunslet Road, Leeds. Also, in addition to the above, there is one of the "M" type gas engines, capable of developing 7 brake h.p. as a constant working load, on Messrs. Pullman and Mann's Stand, Leeds; and an "S" type engine, giving 20 brake h p., on the stand of Messrs. Bradley & Craven, of Wakefield.

H. J. & C. MAJOR, LIMITED.

Majors' patent waterproof roofing tiles are the leading feature of the exhibit of H. J. & C. Major, Limited, of the Patent Tile Works, Bridgwater, at Stand No. 106, Row E. The various patterns of these tiles are well known for their general utility and efficiency, combined with economy. Their adaptability for buildings of every description has been shown by the adoption of them by leading architects, and by the demand for them by landowners, contractors and builders for all kinds of roofing purposes in the United Kingdom, the British Colonies, and foreign countries. The general assortment of ridge tiles, paving bricks, oven bricks, ornamental, and other building bricks deserves special attention, as well as the roofing tiles above referred to. Messrs. H. J. & C. Major, Limited, have been awarded the highest and only award for roofing tiles in every competition in Great Britain and Ireland since 1884, and also the highest and only award for roofing tiles at the Paris Exhibition, 1900.

JOSEPH PLACE & SONS, LIMITED.

The chief exhibits of Messrs. Joseph Place & Sons, Ltd., of Darwen, Lancs. (who occupy Stand No. 135, Row F), are the "Adi" and "Zaza" chimney pots, the patent kiln bottoms, and Place's patent street gulley. The "Adi" and "Zaza" chimney pots are designed to prevent smoky chimneys, by means of having double-arms and louvres, the former with the louvres below the arms and the latter with them above. In the "Adi," when there is a direct down-draught, the wind rushes in at the top and out at the side arms, thus creating a vacuum in the flue. The smoke ascends the flue to fill this vacuum, and is driven out at the side arms. The stronger the wind that falls on the top of the chimney, the better the chimney pot answers. The "Zaza" chimney pot should be used where the wind re-bounds from a high building; as the "Adi" will not in all cases answer under these conditions. The "Zaza" increases the up-draught and prevents a down-draught. The patent chequer bricks for kiln bottoms give increased strength and decreased solid on floor level; rubbish cannot lodge on the supporting walls, nor between the chequers, the supporting walls are tied together and lateral movements are prevented, and a 4-in. pipe can stand anywhere and still have free draught. These kiln bottoms should be seen to be appreciated. The special advantage of the patent street gulley, which is illustrated on this page, is that by the arrangement of the outlet the whole depth of the gulley is utilised for sediment, and still the outlet and gulley are accessible in every part. This distinctly advantageous arrangement is stated to be quite as cheap as the ordinary gulley. Samples of white enamelled and special salt glazed bricks are also shown; these are made from the firm's "diamond" stoneware clay, which enables a brick to be made perfectly true on the bed and still get the same high glaze as other makers.



PLACE'S PATENT STREET GULLEY, NO. 249.

MOORE'S PATENTS COMPANY, LIMITED.

The exhibit of Moore's Patents Company Limited, Nightingale Hall, Lower Edmonton, N., is to be seen at Row C, Stand No. 65. When the sashes of Moore's patent vertical sliding sash windows are at the bottom they are always hinged, and then a person standing inside on the floor can, by moving a handle, turn them inside and paint, repair, or clean the outside, and replace them, as easily as an ordinary door is opened and closed, without steps, poles, risk of accident or detachment. These sashes cannot be opened inwards until they are down and hinged, and when turned inwards for cleaning or full ventilation, they cannot become unhinged, or get wrong when being replaced. When specified of similar material and shape they cost no more to make than ordinary windows.

Both frames in Moore's patent casement windows are exactly the same as in ordinary casements, opening outwards, with solid or nailed-down beadings. By moving a catch on the inside with the finger when the sash is open, the outside will turn inside for cleaning; the sash can be replaced, and the catch pushed back, with great ease and rapidity. When fitted with a non-rattling stay and catch they cost only a trifle more than the ordinary casement. Other exhibits at this stand are: Patent fanlight or skylight openers, two-way door springs and hinges, and one-way door springs. The two-way door springs are screwed on the floor (without cutting a hole for them) and on the bottom of the door, and are almost invisible. They have a screw adjustment to suit them to heavy or light doors, and the wearing part runs in oil.

STANDARD SANITARY MANUFACTURING CO.

The Standard Sanitary Manufacturing Co., who exhibit at Stand No. 82, Row C, have opened London showrooms at 22, Holborn Viaduct. The head office of the firm is at Pittsburg, U.S.A., but they have established branch offices and agencies in all the principal cities of the world, and are now placing on the market high-class porcelain enamelled baths, lavatories, and similar goods. The "Standard" baths were awarded the only Grand Prix at the Paris Exhibition of 1900, and also the gold medal of the Department of Hygiene and Social Economy. The firm control practically every cast-iron enamel bath made in the United States, but none of the plants so controlled produce the bath styled "Standard," which is made only at the works in Allegheny, and under a secret process not granted to the other plants. The following is a specification of an "Elysian" bath: White enamelled bath tub, with 3in. enamelled roll rim; brass common overflow connected with nickel-plated overflow; waste plug with rubber stopper; width, $23\frac{1}{2}$in.; depth, $18\frac{1}{2}$in.; height from floor, 24in.; length over rim, 4ft. 5in.; length inside, 4ft.; price, £7 5s.

Mr. Leon N. Loeb is the general manager for the United Kingdom.

JOHN KNOWLES & CO.

The patent "B.P." safety stopper, to be seen at the stand (No. 83, Row C) of Messrs. John Knowles & Co., of 38, King's Road, N.W., has nothing whatever to do with the gallant defender of Mafeking, the two letters standing for "back-pressure." The "B.P." stopper has a flange and clip with a quarter-turn; and while being easy of access, there is no risk of the stopper being removed. At the same time, for cleansing purposes a quarter-turn is sufficient to unfasten it. Other exhibits of Messrs. John Knowles & Co. are the "Anti-Vap" street gulley (patent), the "Wyvurst" patent improved drainage channels, Light's patent quick flush trap, with narrow channel, and the "Aquarius" wash-down closet.

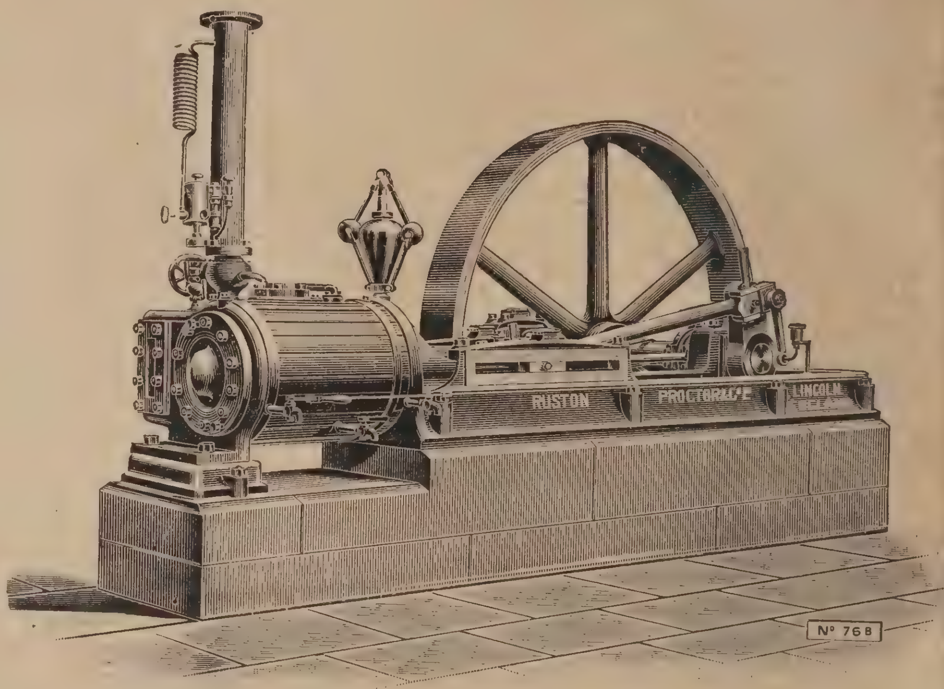
RUSTON, PROCTOR & CO., LTD.

At Stand No. 155, Wall Space, Messrs. Ruston, Proctor & Co., Ltd., of Lincoln, show three types of engines of particular interest to builders and contractors. They are a 14 nominal h.p. double-cylinder portable steam-engine; a 14in. by 28in. longstroke horizontal steam-engine; and a 9 brake h.p. "Ruston" patent horizontal oil engine. The first has all its parts mounted on planed steel seatings or supports, riveted to the boiler, so that no bolts enter the steam space, thus avoiding leaky steam joints and enabling any part to be taken out and replaced with ease. All is of ample strength for 90lbs. working steam-pressure per square inch. This engine was awarded the "Grand Prix" at the Paris Exhibition last year.

The improved longstroke horizontal steam engine made by Messrs. Ruston, Proctor & Co. (illustrated on this page) has automatic expansion gear of the "Stephenson" type, controlled by a very sensitive "spring" governor, and will develop a large amount of power with economy.

The "Ruston" patent horizontal oil engine has several noteworthy features. The consumption of Russian oil is from under $\frac{5}{8}$ pint in the larger sizes to 1 pint per E.H.P. per hour in the smaller sizes. The whole is extremely simple, easily started, and requires practically no attention.

Messrs. Ruston, Proctor & Co., Ltd., also manufacture steam traction engines and road locomotives, steam navvies for excavating, saw benches, mortar grinding mills, winding, hauling and hoisting engines, and all kinds of similar machinery.



IMPROVED LONGSTROKE HORIZONTAL STEAM-ENGINE, BY RUSTON, PROCTOR & CO., LTD.

STANDARDISING SIZE OF BRICKS.

A conference between representatives of the Institute of Civil Engineers, the Royal Institute of British Architects, and representatives of brickmakers, will be held at the Exhibition on Friday next, at 4 p.m., to discuss the question of standardising the size of bricks. The following is the standard suggested by the two Institutions:—

1. The length of the brick should be double the width, plus the thickness of one vertical joint.

2. Brickwork should measure four courses of bricks and four joints to a foot. Joints should be $\frac{1}{4}$in. thick and an extra $\frac{1}{16}$in., making $\frac{5}{16}$in., for the bed joints to cover irregularities in the bricks; this gives a standard length of $9\frac{1}{4}$in. centre to centre of joints The bricks to be measured in the following manner: Eight stretchers laid square end and splay end in contact in a straight line to measure 72in. Eight headers laid side by side frog upwards in a straight line to measure 35in. Eight bricks laid the first brick frog downwards and then alternately frog to frog and back to back to measure 21in. This is to apply to all classes of walling bricks, both machine and hand made and facing bricks. The proposal to arrange a definite standard for the size of bricks is one which should meet with the approval and support of all who are interested in sound brickwork, it being impossible with the varying sizes of bricks as at present made to keep good sectional bond. It is hoped that a resolution will be passed at this conference which will establish a standard as suggested. At the meeting statements will be made as to the standards observed in America and Germany.

Anyone desirous of attending this meeting may obtain admission to the Hall upon application to 43, Essex Street, W.C.

Visits and Meetings during the Exhibition.

Although there was no formal ceremony of the opening of the Building Trades' Exhibition, the opening day was made the occasion of a reception and luncheon to a large deputation of German brickmakers who visited the Exhibition on that day. A number of exhibitors connected with the claymaking industry were invited to meet the deputation, and over 100 sat down to luncheon, under the presidency of Mr. H Greville Montgomery. After the toast of "The King" had been proposed by the Chairman, and duly honoured, the toast of "The Visitors" followed. Mr. Montgomery welcomed the deputation in his own name and in the name of the British Clayworkers, and hoped that their visit to this country would be as pleasan as had that of the British Clayworkers to Germany. These sentiments were conveyed to the guests by Herr Mark, who in returning thanks referred to the great progress that had been made within the last fifty years. It had been his privilege to attend the first great International Exhibition opened by Her late Majesty, and he thought all would agree that in no branch of industry had progress been so marked as in that in the building trades. The present Exhibition was a splendid and instructive one, and he hoped that all those who had exhibited in it would benefit by their enterprise. He asked all the Germans present to drink to the success of the Exhibition and to the host, Mr. Montgomery. This was responded to with musical honours in a hearty manner which astonished the Englishmen present. In responding, Mr Montgomery called upon his friends not to be outdone in lung power, and with the assistance of the band of the Coldstream Guards, which had performed during the luncheon, the Germans were treated to a rendering of "For they are jolly good fellows." The visitors seemed much to appreciate the honour done them, and they were most interested in all the different sections of the Exhibition.

On Thursday the party travelled from London to Sittingbourne, and went over the works of Messrs. Smeed, Dean & Co., Ltd., one of the largest firms of brick manufacturers in this country. The visitors were entertained to luncheon at the Town Hall, under the chairmanship of Mr. Dean, the managing director. This week they are due at Peterborough.

The following are the remaining visits and meetings that will take place during the time the exhibition remains open—till April 27th:—

Wednesday, 24th.—Visit of Institute of Sanitary Engineers.
Thursday, 25th.—Visit of Society of Architects. Annual meeting and dinner of Institute of Clayworkers.
Friday, 26th.—Conference on standardising of bricks, at 4 o'clock.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

May 1, 1901.
No. CCCXXV.

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Arundel Street,
Strand, W.C.

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Special attention is directed to the three new insurance schemes which we have instituted. Particulars will be found on page 242 of this issue.

An Architectural Causerie.

The Young Engineer. Mr. Maw is to be congratulated on his excellent presidential address to the Institution of Mechanical Engineers (see page 238 of this issue) and for the clear and capable manner in which he dealt with the problem of educating the young engineer. There can be no doubt that our systems of technical examination are in many respects deficient and in some respects absurd; for instance, a person intending to become an architect or an engineer is obliged to devote a great deal too much time to geography, political history, and similar subjects quite without his sphere. A general knowledge is well and good when kept within bounds, but when its acquisition means the sacrifice of time and energy only too much needed for the study of the special work in view, the system becomes foolish. The adage that one thing at a time is essential to success has no truer application than that of engineering education. To do any good, one must specialise. It is imperative for the engineer to concentrate all his efforts on one branch of his work, and even then he will find that *tempus fugit*, while the acquisition of knowledge is exceeding long. But specialisation must not be adopted too soon, for here is another pitfall. For instance, an electrical engineer who commences to specialise in instrument-making without having had a general experience of workshop practice will find himself greatly hampered and his outlook restricted. We are, however, quite in accord with Mr. Maw's views that specialisation should at least be commenced during the college career rather than subsequently.

A Street View in Granada. The illustration on this page of a street view in Granada is from a sepia drawing by Mr. Francis W. Bedford, who has established so excellent a reputation as a draughtsman. Wherever the Arab and Moor have been there we see the same blaze of colour—in coloured tile or wall, bright-toned roofs, variegated hangings and gilded enrichments. This drawing by Mr. Bedford possesses the great characteristic of *feeling* colour though in black and white. We also *feel* the sunshine, and can imagine ourselves walking down that brilliant street, dazzled by the glare—perhaps stifled with the heat—but certainly charmed with the colour scheme.

Christ's Hospital. Christ's Hospital, off Newgate Street, is so interesting architecturally, and possesses a history so replete with honoured associations, that one anxiously awaits the decision of Parliament in regard to the Bill which, if passed, will enable the Governors (with the consent of the Charity Commissioners) to sell the site, the object being to sweep away all the existing buildings and replace them with shops and warehouses having "all the latest improvements." The Society for the Protection of Ancient Buildings (with Lord Balcarres and Mr. Thackeray Turner at their head), Lord Monkswell, and other influential gentlemen are doing their utmost to prevent this happening, their contention being that there is no necessity for such a demolition. Two years ago the Charity Commissioners sanctioned a scheme for removing the principal school to Horsham (where the new buildings designed by Mr. Aston Webb, A.R.A., are making good progress), but there was nothing then said about pulling down the old buildings. It is averred that unless the site is sold there will not be sufficient funds to conduct the school at Horsham, but it does not seem that the other resources of the foundation have been exhausted, nor—a most important fact—have efforts been made to let the schools for other purposes; in fact, the Commissioners strongly oppose the proposal that the buildings should be adapted to the needs of St. Bartholomew's Hospital close by. "The difficulties which hamper the free treatment of the site appear to be that parts of the site are leasehold, and that a large part has at some period been used for interments. Parliament has declared that it is unlawful to build on a disused burial-ground, and it is sought by the present Bill to override this enactment." Apparently the chief idea of the promoters of the Bill is to get as much money out of the site as they can—it matters not how; and we therefore hope that their project will be defeated and a fine building thus allowed to grace the City for many more years to come.

A STREET IN GRANADA. DRAWN BY FRANCIS W. BEDFORD.

Standardizing Bricks. We are afraid that the conference held at the Royal Agricultural Hall, Islington, on Friday last, did not effect much towards the standardization of bricks, though indirectly it may have been the beginning of what will ultimately result in some standard being adopted. The resolutions of the joint committee of the Royal Institute of British Architects and the Institute of Civil Engineers were laid before the meeting for confirmation, but what actually took place was the pressing of a resolution "that it is desirable to form a committee to consider the propriety of standardizing the size of bricks." As will be seen, however, by the report which we publish on another page, several interesting opinions by representative men were expressed at the conference. Though the views expressed differ so widely, of three things there can be no doubt. First, it is extremely difficult to determine what the shrinkage in a particular brick will be. Secondly, good bricks conforming to the standard will be more costly than those which do not. Thirdly, brickmakers at present experience no difficulty in selling their bricks irrespective of any standard, and therefore, if any change is made, it is for the convenience of architects, engineers and contractors. On the whole, we think the best that can be done will be for the committee that is to be formed to decide on a standard and then leave it; to the brickmakers to do their best to conform to it; but brickmaking is not an exact science and those bricks which will need to be "thrown away" because they are above or below the standard size will doubtless offer considerable hindrance to the proposal being adopted throughout the country.

SOME NORTH CORNWALL CHURCHES.—I.

BY FRANK BAINES.

ARCHITECTURE in England, and especially in the counties of Cornwall and Devon, has taken into indissoluble partnership a second and, one might say, supreme decorative power. Nowhere else is this more apparent than in the West Country—that hot-bed of cliquism and paradise of extreme partisanship, that county of strong English characteristics and plain simplicity of manners.

The predominant partner I speak of is Nature. There can be little doubt of her predominance, for she has written it across almost all the churches in bold strokes of her inimitable hand; and only where the church stands away from her on the extreme cliff edge, facing the rude Atlantic breezes, does she seem to lose her power. Yet even here she sends her army of smaller pioneers, in the shape of mosses that lurk wherever a cranny will give hold, and the multi-coloured lichen which marks every stone her debtor. She holds them in the face of the storm and the bitter flying surges, which fling the shingles high over the rocky headlands. The stinging spray bombards her, but the tamarisk flourishes through it all, and the lichen and all the varied mosaic work tells of her partnership.

Architecture in North Cornwall is not given to grand or striking effects; it is the expression of a people homely, quaint, and very strong, with an original turn given to an old style. Even the style is charged with an individual character in keeping with the country; an odd strangeness marks it as a new creation rather than a model of the "mode." It can never be studied for its light upon the style of its age, but it will, I think, be often studied for itself. This study will amply repay any enthusiast, for it is so intimately connected and linked with the life of its people that a rich harvest can be reaped of legends, ghost stories, parsimonious parsons, and tales of the pirate kings of the coast and their dare-devilry. They are all bound up together, the present, the past, the people and their churches; for though Nonconformity has a great hold on Cornwall, all the legendary life and history belong to the churches.

The bit of coast which runs south from Bude and Boscastle past Tintagel headland, and round the sweeping bays to Trevone, Pentire, and Trevose Head, enclose within a twenty-mile circle a vast amount of interesting architecture. Interesting is the adjective I apply to it in the strict sense, for it is extremely so, a most fascinating county architecture, yet, as I have said before, with no grandeur, no splendid effects, no sublimities. I state its limitations only to enforce its charm, and in no wise to qualify it, for to many the charm of quaintness, of quiet beauty, of green old age, both literally and figuratively, is enough.

The whole countryside abounds in churches, all with some claim to attention, and many possessing great interest both architecturally and archæologically. From a long rolling down which runs landwards from Port Quin the eye can sweep round for miles over undulating luxurious pasture land, with the combes thickly wooded in between. Topping the shoulder of down, the tall spire of St. Minver rises on one hand; St. Endellion, far away to the south, thrusts its square tower into the heavens; St Mabyn, one of the highest Cornish towers, rears well up into the horizon; while right across the bay, presiding above the foam, Tintagel church stands stiffly upon its headland eight miles away. The observer will not see the charming little church of St. Kew. It is hidden in its bower of pine and oak trees, deep in its own little combe. The down runs up from its south transept, the cross upon the roof of which is on a level with the roots of the elms which crown the summit. The church is early fifteenth century, and was restored somewhere about 1880. The old cradle roofs still remain, stained almost black with age, but its great attraction is its tower. To see it backed by the pine and elm foliage, with a declining sun full on its grey granite stones, each one marked by the weather, with soft yellow patches of lichen and tufts of spear grass growing high up from its arcades, is a picture not readily to be forgotten. A tapering stair-tower and turret runs up the whole height of its north side, rising with battlements above the main tower, while a rounded rain-worn labelling clasps it at the level of the arcading. It is perfectly simple, and yet the fascination it exercises is quite indescribable. To look down at it, a dull grey gem in its rich green setting of foliage, gives a deep thrill of satisfaction not to be accounted for by its architectural value. It contains a window made up from fragments of old glass of the middle fifteenth century, which is worth notice for its brilliancy and from the fact that little stained glass has been spared from pre-Reformation times.

MAWGAN CHURCH.

MAWGAN CHURCH.

The quaint little church of St. Petroc Minor is, like St. Kew, regarded as of scant interest; for little mention is made of it anywhere, and it is impossible to get photographs of either of them, yet St. Petroc, like St. Kew, would fascinate the artist-architect. Great bushes of hydrangea covered with bunches of pink and white blossom lean against its walls. It was here I was requested "to keep close the fish nets over the door or else the swallows would get in and disturb the worshippers." In this church is a picture covered with a cloth screen, about which I could find nothing. It looks rather like one of the old Dutch masters, and yet seems too modern in its treatment to be genuine. A seated figure of a woman almost whelmed in shadow looks out from the canvas. The face is powerfully formed—a pure, rather plump, type of low Dutch, with startlingly clear eyes. The only other things in the picture are a book and a skull; and what the subject idea was I could not guess. It was sufficiently strange to meet such a picture in the little church of St. Petroc, even though it is mentioned in the Doomsday Book. But greater anomalies than this are to be found in some of the Cornish churches.

They can be taken in any order, these churches, when driving about the lovely Cornish lanes with their huge massed hedges of briar and bramble and innumerable wild flowers. They usually convey a warning of their presence to the interested long before he reaches them, their square grey towers, and spires in a few cases, quietly drawing the attention to them, over miles of placid landscape. Only when they are completely bowered in trees, like St. Kew and St. Mawgan, or hidden away among the sand dunes and behind the tamarisk, like St. Enodock, do they escape the eye.

St. Enodock is most quaint of many Cornish churches. Approaching it from Rock over the piled sand hills, it is blotted out completely until Bray Hill is reached, a sandy eminence overlooking the doom bar of sinister memory to sea folk. Letting the eye sweep beyond Polseath, it is met by the stern headland of Pentire, which when seen with its feet in the foam and its crown in a cloudy glory of sunsetting, will draw many a sightseer to ignore the little church of St. Enodock that lies almost at his feet among the sand dunes. This church is, like most of middle fifteenth-century origin, built of grey granite of great thickness, and so tiny that it seems the nave alone—it has no aisles—would only hold about twenty persons abreast. It contains a Norman font of simple design, supported on four pillars capped with clearly-cut heads, and with a thick cable mould at the base. It is much too large for the present building, which stands on the site of an old oratory to which it probably belonged. A feature of its churchyard, beset by a high sandy wall, is the collection of granite piscina lining the path to the door. There are some old slate tombstones lately uncovered, deeply cut in relief and extremely well executed. Their inscriptions alone are well worth a visit, hinting as they do at the life of the wild crew which smuggled, engaged in mild piratage and drew vessels to their doom upon the rock-bound, sand-set coast. The church has been almost completely buried by the shifting sand, wind-carried from the doom bar; and a tale is told of a dear old vicar who, to collect his dues, excavated to a window, and from it read the lessons, so setting the example to its future excavators. The strange little crooked tower, with its truncated top, has its separate legend; for when the first service was read, after its hundred years and more of burial in the sand, the name of Our Lord drove the Devil pell-mell, helter-skelter out of the building by the tower, from which in his extreme haste his cloven hoof struck off a piece, and, as the tale is repeated, so it can be seen to this day.

It will be impossible to mention all the churches of interest: the little chapel of Saint Michael of Rock must be passed over. St. Breock again, with a fine Decorated tower and font, must be left also, while Padstow can only have a passing reference. It is a beautiful church, with a square strongly-based Early English tower, the old timber cradle-roof still remaining with some old glass in the windows of nave and aisles; yet the charm of the place cannot be expressed in architectural terms. It lies in the churchyard enclosed and cut off by masses of foliage from the town; the tombstones lying all ways, the shaped yews, and conical firs presided over by the tower, lend an air to the place which cannot be described. Passing from the south, north along the coast road, the little village of St. Teath is met on the road to Camelford. To reach the church you walk between tiny leaning cottages thatched thickly with straw, many of them heavy with masses of wistaria and jessamine. A crimson passion flower grew right up to the eaves of one, hanging over the windows and on each side of the doorway. The cottages are mostly built of the waste slatey stone from the Delabole quarries, sometimes without a trace of mortar between their joints. It is of a purple-gray colour, a very good medium for the weather to work upon, turning every imaginable tint after a few years. The church contains a powerfully carved and coloured pulpit of early seventeenth-century workmanship, not quite a success in its colour, and strangely at variance with the spirit of the cold, rigid little building. The east window of the south transept has some old heraldic glass of great richness, the shield of Henry VII. being conspicuous. Within the north transept an effigy of the thirteenth century makes a point of considerable interest comparatively. The strict architectural stylist would attack roundly here for any admiration expressed; for when put by the side of some specimens of French Gothic of the period, how lamentably it fails! It must not be judged in this way, however, for it is a speciality in itself, and can only be judged accordingly. There are many of the carved oak bench-ends still in a good state of preservation, all of an extraordinary versatility of design, and some with a quiet beauty which cannot fail to make its appeal. These are to be met with throughout the Cornish churches, St. Minver especially being distinguished by a great number. St.

Endellion also contains some beautiful specimens; but this church having been restored with far less care and solicitude than St. Minver, they have been spoilt by varnishing. The designs are mostly different, and include a scheme embracing almost all forms and ideas familiar with the people; one which is repeated in two or three churches good distances apart, and evidently appreciated, is that of a fox preaching to [some geese, the moral of which has been interpreted somewhat diversely.

The churchyard of St. Teath holds a huge Cornish cross in granite 15ft. high. It was until lately built into a fence in its separate pieces, but has been recovered completely and set up in the raised churchyard, from which it loftily overlooks the narrow lane. It is of the most usual Cornish type, a tapering granite shaft rising from a single step base, and speading out into a cross of slightly Maltese type, with a ring connecting the flanges. It is of a most happy proportion, seamed and scored by the boisterous weather, and is an imposing object from the narrow by-way. A cross most unlike the Cornish type I have met with is in Mawgan churchyard. It is very delicately executed, and very different to the rude strong crosses seen elsewhere. An octagonal shaft 3ft. to 4ft. high supports a canopy with four niches. One contains the Deity, with a crucifix between His knees; in the next are a king and queen kneeling at a lectern, beneath which an angel unrolls a scroll. An abbot and abbess occupy another niche. the mitre looking somewhat like a crown. Above the canopy, the stonework has been shattered, although there seems to have been a second and smaller canopy which terminated with some form of pinnacle cross. The date of this is about 1340, and it was, I should think, executed outside Cornwall.

The famous "grey convent of Lanherne," near the lovely Carnauton Woods, has an ancient runic cross in a small corner shubbery of its grounds. This cross is of unquestionable antiquity, the shaft sculptured with intricate knotwork twisting in mazy ordered coils upon all of the four sides. Upon the face of the cross itself, and in rude relief worn away almost past human resemblance, is a small figure, evidently purporting to be that of Our Lord. This cross is unique of its kind in North Cornwall, and within its tiny enclosure adjoining the nunnery is most striking. This nunnery was originally the old manor-house of the Arundels, and parts of it date back to the twelfth century. It is a most beautiful building, containing wonderfully carved and panelled interiors, which now unfortunately are closed to the public owing to an insult given to one of the nuns by an ill-mannered boor, who took a bet that he would kiss one of the inmates. The chapel and part of the grounds were until last year still left to be visited, and the long front of the building, with its great Gothic bays, its rich arched doorways, carved lead guttering and edging, the heavy rainwater heads of beautiful design and execution, form such a picture as would warrant alone a visit to this part of Cornwall. The chapel has since been closed to the public, consequent upon the unseemly behaviour of the public within it at a ceremony when a novice was "wedded to the Church." It is an interesting building, fitted up in the style of Louis XIV., but is not to be compared to the nunnery wing. It contains a picture of the Flagellations of Christ, attributed to Rubens, and though it is in the style of his work, there is little doubt that, even if of that period, it was executed by one of his numerous "pupils" rather than by himself.

ST. ENODOCK CHURCH.

All this while within the grounds of the "grey convent of Lanherne," the splendid church of St. James Mawgan rises in full view of us. I use the word "splendid" advisedly, for among the churches of North Cornwall, Mawgan comes next to St. Columb Major as one of the most beautiful. Its position goes some way towards making it supreme, but the church itself can make its claim alone, without aid from its situation. The building is Perpendicular throughout, and the fine tower stands 80ft. clear from the level of the nave. The stair-tower finished with the charming little pinnacle turret rising high above the battlements is a feature of many Cornish towers, the one of St. Kew terminating in battlements alone, which mount above those of the main tower. High up, and rising to the labelling below the battlements, masses of climbing and tree ivy grow right out of the crevices of the stonework. A curious detail of the tower is a built-up doorway at a height of 30ft. or 40ft. in the south side, the use of which I could not gather. This church was restored by Butterfield, and although successful on the whole, the contrast between the restored and unrestored windows in the east end is rather painful. The interior contains part of an old rood-screen, the altar side of which is most richly carved in high relief. Many old bench-ends remain, some far exceeding any I have seen for quality of design. The capitals of the columns have a banding below the abacus, running round with a heavy leaf-work cut in it: this is an idea carried out in many Cornish churches, some, indeed, having the identical detail although thirty or forty years separate their dates. The font is modern in its mounting, the basin with its four carved heads being of Norman workmanship and discovered in the churchyard.

(*To be concluded.*)

ST. ENODOCK CHURCH, CORNWALL.

THE EIGHTEENTH-CENTURY ARCHITECTURE OF BATH.*

BY M. A. GREEN.

IN this paper we are mainly concerned with the period between the years 1727, when the elder Wood came to Bath, and 1781, the date of the death of his son. But it is necessary to review the work which preceded and which followed theirs.

A Dr. Johnson's view of Bath as it was in the year 1572 shows the city surrounded by its walls, of which there are now few traces except in name. The size of the city at this time was about 1,200ft. from east to west and 1,150ft. from north to south. By 1590 the city was much enlarged, and by a charter granted by Queen Elizabeth extended from the bridge over the Avon at the bottom of Southgate Street along the middle of the river as far as the meadow called Kingsmead, and thence to the highway leading from Weston to Walcot, and so to the Win Yards, or Vine Yards, thence by Walcot Churchyard, and so along the middle of the river back to the old bridge.

A word here as to the Bath waters. Wood says in his "History of Bath": "About the latter end of September in the year 1663, the King (*i.e.*, Charles II.) brought his Royal Consort, Queen Catherine, to Bath; Sir Alexander Frayser, as chief physician, attending them hither, who, upon finding the hot waters to be from the same minerals as those of Bourbon, and that they could be pumped up directly from the spring, began to advise the inward use of them . . . From this period the drinking of the hot waters of Bath may be very justly said to have been established, and from the same period the trade of the city began to turn from the woollen manufacture to that of entertaining the strangers that came to it for the use of the hot waters."

In 1702 and 1703 Queen Anne and her Royal Consort, the Prince of Denmark, came to Bath. In the following year Dr. Oliver began to write on the Bath waters, and in consequence the Corporation improved their surroundings somewhat, but they still fell short of the Doctor's wishes, and in 1707 he published a practical dissertation, at the same time recommending the making of a cold bath for the use of the public. About this time Parliament was applied to for power to amend the principal roads leading to Bath, to pave, cleanse, and light the streets, lanes, &c., of the town, and to regulate and license a sufficient number of chairmen, that nothing might be wanting for the public utility of the city. "Twenty years," says Wood, "had now been spent in improving the private buildings of the city; in the course of which improvements, thatch'd coverings were exchanged to such as were tiled; low and obscure lights were turned into elegant sash windows, as soon as Mr. Taylor (who was, by the way, a chairman) had set the example: the houses were raised to five and more storeys in height; and everyone was lavish in Ornaments to adorn the outsides of them, even to profuseness." But with all this splendour little attention was paid to the wants of the company that assembled at Bath until Harrison's rooms were built in 1708. In spite of a reaction on the part of the citizens because of the increase in the numbers of the houses, Mr. George Trim, a member of the Corporation, and whose mother was a near relative of Inigo Jones, began in 1707 to build the street named after him at the north-west corner of the city.

The houses about this period are characterised by the large windows with projecting wave mouldings round them. Of such is the Saracen's Head in Broad Street, with the initials W. D. and date 1713 upon it. It was here that Dickens used to stay. The oldest house in this street is No. 38, date 1709; and almost identical with it in elevation is one in Chapel Court. I think these are by far the best of the older houses in the city.

In 1716, on the site of the new bowling green, a row of houses was begun, and was called Green Street. It is one of the most picturesque parts of Bath now remaining.

Meanwhile another citizen had been building in the south-east corner of the city. In a house in St. James Street South small panes of glass still remain in the lower windows; these make at once a feature in the design, whereas in the upper lights, where plate glass has been substituted, the windows seem to lose their identity with the building. Hard by is Weymouth House, which was built in 1720 for a Dr. Bellinson, and was designed by William Killigrew. An almost exact copy of Weymouth House is to be found in No. 3, St. James Street. Nearly opposite to Weymouth House is a curiously rusticated building, which was once Crutwell's "Bath Chronicle" office. The Orders are used, as seen frequently, to make a central feature, but the treatment is not good.

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* Summary of a paper read before the Architectural Association on April 19th.

We must here notice old Widcombe Manor, built for Mr. Philip Bennett's son in 1727. The builder was likely to have been the Thomas Greenway who put up Beau Nash's house in St. John's Court, now the theatre. The garden house here is a refined piece of work. From a comparison of this building with the Palladian Bridge in Prior Park I am disposed to think they are by the same hand, and that if the Palladian Bridge was designed by Wood, then this little house was also. The building called the Garrick's Head, and known as the Theatre, was at one time the residence of Richard Nash, M.C. of Bath. Nash had a chequered career. Born in Swansea in 1674, he went to Oxford at the age of sixteen, and, having tried the law and the army in turn, finally entered the Temple. In 1704, however, he came to Bath, and on the death of Captain Webster he was appointed M.C. This house, situated in what was known then as St. John's Court, was built in 1720 by the Thomas Greenway above mentioned and after whom Greenway Lane is named. After Nash's power had declined he removed to another house just north of the last, and here he died in 1761.

PADSTOW CHURCH.

On the other side of the theatre are Beaufort Buildings, which Wood says are the piratical architecture of a Mr. John Strachan, a friend of Mr. Hobbs, a timber merchant, of Bristol, whom we mention below. Londonderry House and Kingsmead Square were also built by Mr. Strahan.

In 1723 another Act was obtained for Bath relative to lighting, cleansing, and other things, and to make the former Act more effectual; and "in 1724," says Wood, "a subscription was opened by Mr. John Hobbs, a deal merchant of Bristol, for carrying the navigation of the river into execution, so that when I found the work was likely to go on, I began to turn my thoughts towards the improvement of the city by building; and for this purpose I procured a plan of the town, which was sent me into Yorkshire in the summer of the year 1725, where I, at my leisure hours, formed one design for the ground at the north-west corner of the city, and another for the land on the north-east side of the town and river." Little is known of John Wood's early life. He was born in 1704, and it is probable that he was introduced to Bath through the influence of Ralph Allen. "After my return to London," he continues, "I imparted my first design to Mr. Gay, an eminent surgeon, in Hatton Garden, and proprietor of the land; and our first conference was upon the last day of December, 1725. On March 31st following I communicated my second design to the Earl of Essex, to whom the land on which it was proposed to be executed then belonged; and in each design I proposed to make a grand place of assembly to be called the Royal Forum of Bath; another place, no less magnificent, for the exhibition of sports, to be called the Grand Circus; and a third place, of equal state with either of the former, for the practice of medicinal exercises, to be called the Imperial Gymnasium of the City." In May, 1726, during the consideration of the drawings, a great fire broke out in Horse (or Southgate) Street, and the larger houses that took their place were the last built before 1727.

In November of 1726 Wood fixed his preliminary articles with Mr. Gay, who then empowered him to engage with anybody that he could bring into the scheme for the building of a street 1,025ft. long north to south, by 50ft. east to west, for a way to the grand part of the design. This was Berton Street, but at first it did not go forward, and Wood having two other schemes on hand, and finding it necessary to have good workmen, determined to become his own contractor. The first scheme was the building of a court of houses for his Grace James, Duke of Chandos, and the second was a canal between Bath and Bristol. For the canal he obtained men that had been on the Chelsea Waterworks; and he says "that until that time the real use of the spade was unknown in and about the city." "I likewise," he says, "provided masons in Yorkshire, carpenters, joiners, and plasterers in London and other places, and from time to time sent such as were necessary down to Bath to carry on the building that I had undertaken; and it was then, and not till then, that the lever, the pulley, and the windlass were introduced among the artificers in the upper part of Somersetshire, before which time the masons made use of no other method to hoist up their heavy stones than that of dragging them up with small ropes against the sides of a ladder."

At that time he was asked to prepare plans for dwelling-houses, an assembly house, and a general hospital, and in 1727 he left London altogether, and followed his workmen to Bath. In 1727 Chapel Court was begun. The house to the left is that in which Horace Walpole lived in 1765, and the wing to the right St. John's Hospital or the Blue Arms, designed by Wood in 1728.

The death of the King (George I.), however, causing Mr. Gay to fall from his bargain, and the Corporation making light of Wood's schemes, the latter dropped his agency, became absolutely his own master, and took ground from Mr. Gay for the building of Queen Square, so named in honour of Queen Caroline. John Street took the place of Barton Street, and Barton Street was what is now the east side of Queen Square and part of Gay Street, as well as the portion to the south.

At this time (1728) he was building an addition to the north side of R. Allen's town house in Lilliput Alley, putting also a new front to and raising the old building a storey higher. There was thus a basement storey and, as in Queen Square and later on by his son in the Crescent, an order rising through the two storeys over with one crowning cornice, and he says that it was "a sample of the greatest magnificence that was ever proposed" by him for the city houses.

In 1730 the houses of the Duke of Chandos, called Chandos Court, were being erected. They were to form three sides of a square with a garden in the middle. Chandos House had been rebuilt in 1727 for the Duke.

Queen Square was in reality Wood's chief delight. The first side built was that on the east, which was begun in 1728. The whole was finished in seven year's time, including the chapel and many houses adjacent. The width of the square from house to house is about 315ft.

In making the grand façade, as we may call it, on the north of the square, it was to be, as it were, a palace, and the east and west sides the wings. The original intention is shown in the plate in his own book. The design, as usual with him, was a simple one—a rusticated basement with the Corinthian order over and a large crowning cornice just as in Ralph Allen's house, and yet from its treatment so different in effect as was fitting to a widely extended façade such as this. The windows have alternately triangular and circular pediments, as in a similar storey in the Farnese Palace at Rome. A bronze tablet has been lately put up on the centre house to mark the residence of the elder Wood. It was here that he died on May 23rd, 1754, and here also his widow deceased some twelve years later. There was no shirking of finish in the case of John Wood's builders, though the work was often of a speculative nature. At the south-west angle of Queen Square stood the chapel of St. Mary, begun in March 25th, 1732 and completed at the end of 1734. Ionic capitals from the interior yet remain on the site of the chapel.

In 1729 Wood built a villa called Eagle House at Batheaston, where he lived for some time. The house has been much altered. The younger Wood died here in 1781.

While mentioning the works of Wood outside the city, it will be well to include two or three more houses which he built at various times. The little house called Lilliput Castle was built by Mr. Jerry Pierce, in the year 1738, against the north end of Mons. Badonca, that is, Lansdown, and formed the nucleus of what is now known as Battlefields. From its form the wits of Bath called it T. Totum. The whole structure was but 120ft. square. It suffered two fires, and was afterwards altered.

At the south end of the Kingsdown at Bradford-on-Avon stands Belcombe Brook Villa, built in 1734 for Mr. Francis Yerbury. The situation is extremely pleasant, the grounds sloping down to the river Avon, and it was here that Wood showed himself to be a master of landscape gardening. To the right of the courtyard is a stone-built dovecot, and the paving in the courtyard is as originally laid. From each angle of the house a balustrade runs diagonally into the garden, following the slope of the grounds.

At Bathford, on an eminence of Kingsdown and looking north-west, is to be found one of the most finished of Wood's buildings. Titan-Barrow Loggia was erected some fourteen years after Belcombe Brook Villa, in 1748, for Mr. Southwell Piggott.

The mansion of Prior Park was the largest and best work of Wood, and was begun about 1735. Let him speak as to its origin: "The reflection cast upon the freestone of the hills of Bath brought him (Mr. Allen) to a resolution to exhibit it in a seat which he had determined to build for himself near his works, to much greater advantage and in much greater variety of uses than it had ever appeared in any other structure. Thus it was that Ralph Allen, whose little house in Lilliput Alley we have seen, came to build himself such a vast country mansion." The scheme of the design was three-fold—a central mansion with east and west wings and a pavilion placed between these three more important buildings, the mansion occupying about 150ft., and the whole line of building from end to end about 1,200ft. or 1,300ft. in length. The south side of the mansion facing up the hill towards Combe Down, and at a height of about 460ft. above sea level, consists of a hexastyle Ionic front with attached columns and this forms the entrance. The north side, looking towards the city is a fine front and is full of detail. In the first place the natural slope of the ground allowed of the basement being entirely exposed. Wood never intended the flight of steps as now seen, although I cannot help thinking that this has added greatly to the dignity of the building. The fine projecting hexastyle portico was intended to be a rival, and something more, to the one which the architect Colin Campbell had erected at Wanstead House, in Essex; for whereas that one had columns of 3ft. in diameter, these were 3ft. 1¼in., and on the return side are two complete intervals between the columns, instead of one and a small portion of another as at Wanstead.

Prior Park was finished in 1743. Two fine sweeps of stone steps with balustrades and vases form an architectural treatment of the gardens below the great portico. They were executed by Bishop Baines about 1830. At the foot of the slope lies the Palladian Bridge, considered to be the work of Wood. Here are the old fishponds once belonging to the Priory of Bath, and from which Prior Park takes its name.

When Wood's scheme for building a grand parade on the south side of Queen Square was abandoned, and Wood Street, which had been intended to be 100ft. wide, was reduced to about half that amount, Wood turned his attention to the large space at the south-east side of the city, and began to lay out his ground and buildings on a large scale. This space was the old Abbey Orchard. The first stone of the first house of the Grand Parade (now North Parade) was laid on March 10th, 1739 40. The Royal Forum, or South Parade, was begun in January 1742-43.

South of Ralph Allen's town house, and little known or appreciated, there lies a large court built by Wood, with good houses on either side, of about date 1740. They are North Parade Buildings, formerly called Gallaway's Buildings.

There seems to have been considerable difficulty in the commencement of the Mineral Water Hospital, called then the General Hospital. The site at first proposed in 1727 was on the north corner of the Ambrey, but the first stone was not laid until July 6th, 1738, on a site in the north part of the city. The hospital was finished in 1742. The stone and other materials for this building were provided by Ralph Allen. Although Wood prepared the designs for the Grammar School in Broad Street, it is not known that he executed the building.

The "History of Bath," published by John Wood the elder in 1749, though in part a chimerical work, is a valuable addition to the records of the state of the city during the first half of the eighteenth century.

Gay Street was designed by the elder Wood, but executed by his son, and it was in the house at the corner of Queen Square and Gay Street that the younger Wood lived. The panel on this house shows that John Wood the younger was born in 1727 and died 1781. The Circus was also designed by the elder Wood, and carried out by his son. The buildings were begun in 1754, and they took fifteen years in completion.

The æsthetic sympathy of the younger Wood with his father is a remarkable feature in his buildings; and it seems to me not unlikely that as Gay Street and the Circus were the designs of the elder Wood, they may have conferred together as to the buildings west of them, and that the younger Wood may have been guided in their development by the advice left him by his deceased father; at any rate, in the Crescent exactly the same use of the order is seen as in Queen Square, though less elaborately worked out, and in the Assembly Rooms the broad treatment of spaces externally and internally is observable, as in the work of the elder Wood. It should be noted that originally the roofs, as indeed the roofs throughout Bath, were covered with stone tiles, and a more artistic covering can hardly be conceived. The eye is thus carried up to the topmost part of the building, and sees it as one harmonious whole. The Crescent, which, as we have seen, was the work of the younger Wood, whose buildings we are now considering, was begun in 1767, but not finished till about eight years after. The diameter of the Circus from house to house is about 320ft., and the major axis of the crescent (an eclipse on plan) 550ft. It appears to have been the intention of the Woods to build another street beyond the Crescent, and another Crescent beyond that again, but Marlborough Buildings effectually put an end to any such scheme. Brock Street was the work of the younger Wood, and connects the Circus and the Crescent. In it is Margaret's Chapel, which has a good Venetian window overlooking the street.

The first stone of the New Assembly Rooms in Alfred Street, on the east of the Circus, was laid by Wood in May, 1769, five years after the proposal to build a somewhat similar set of rooms at the north-west corner of Queen Square. The rooms were finished in 1771, at a cost of £20,000, on the ground covering over an acre and a half. They were formerly called the New, or Upper, Rooms. The planning is exceptionally good.

Alfred Street was also built by Wood.

It is probable that about 1776 Wood rebuilt the Leper's Bath, adjoining the Hetling Pump-room. This is a piece of work which is little known. About the same time he built Woolley Church, near Bath, the cupola of which is worthy of note. In 1779 he built Hardenhuish Church, near Chippenham, a cleverly-designed piece of work.

Before leaving the history of the Woods I should mention that the Exchange in Bristol was by Wood senior, erected 1740–43; also Redland Court, in the same city, the latter with terraces in the Italian manner. Shockerwick House, near Box, was built by him in 1750.

There still remain many interesting buildings in Bath which must not be passed over. Milsom Street was probably designed by Robert Lightholder about 1760. He at any rate designed the Octagon Chapel there, which was opened in 1767. About this period the Corporation had to rebuild the old Town Hall, and one Thomas Attwood, who about the year 1762 had built a family house for the Pulteneys in Grove Street on the farther, or Bathwick, side of the river, was instructed to proceed with the matter. This house afterwards became the gaol, and, considering that Attwood's trade was that of a plumber and painter, it shows no little talent. He died, however, from the effects of an accident while the old houses near the Town Hall were being cleared away, and shortly afterwards, in 1774, a plan for a town hall and markets was offered by Thomas Baldwin, who was then only twenty-four years of age, having been born in 1750. These were approved by the Corporation and carried out. Thus Baldwin became the chief follower of the Woods. In 1780 he was made city surveyor, and four years later city architect. Baldwin's work has not the strength of that of the Woods, but depends more on surface decoration. The building was completed in 1777.

Passing down Bridge Street we come to the Pulteney Bridge, which was built about 1776 from designs by Robert Adam for his patron, William Pulteney, Earl of Bath, that he might have the more ready access to his Bathwick estate.

Beyond this the domestic work of Baldwin is principally seen. In 1788 Laura Place was commenced. Great Pulteney Street, which was begun about 1792, was his finest work.

The old Pump Room had been finished in 1706. It was much enlarged in 1751. Previous to 1780 Reveley had been commissioned to prepare plans, and work was commenced and carried to a considerable height at the west end. On the appointment of Baldwin as city surveyor in that year, however, the work was stopped, and he in his official capacity had to prepare plans. In 1788 a committee was formed to discuss them with him, together with the estimates, and work appears to have commenced; but difficulties arising between him and the Corporation, it was again suspended. In 1794 John Palmer gave new plans and elevations, and in 1799 the new Pump Room was finished under his direction.

In about 1790 Reveley had built Camden Crescent, remarkable for the manner in which the rise of the ground is overcome in the design.

In 1789 an Act of Parliament had been obtained for the improvement of the older part of the city, and much was done within the next few years. A new street was built to connect Milsom Street with Stall Street, as formerly the back part of the Bear Inn premises served for this purpose. This was Union Street; Cheap Street and Westgate Street were widened, and Bath Street was built, all under Baldwin.

A New Sailors' Home at Chatham is being erected at the top of the Military Road, near the Town Hall, from the designs of Mr. G. E. Bond.

TO IMPROVE WESTON.

THE NEW PAVILION SCHEME.

A GREAT many schemes have been mooted at one time or another with the object of improving Weston-super-Mare as a seaside resort. One was a Transatlantic port at Brean Down for mail steamers, which was to earn for Weston an international reputation. This progressed farther than most of the other ideas, for the foundations of the harbour were put down before the undertaking was abandoned. A long time afterwards there was a big meeting in the town's assembly rooms, when the scheme was resuscitated, but that was ten years or more ago, and nothing has come of it yet. Later Parliamentary powers were obtained for the erection of a pier running from Regent Street, opposite the centre of the bay, to low water. It was a big undertaking on account of the tremendous length of the proposed structure, and eventually the powers lapsed. A time extension was obtained, but to-day the pier is still a proposal, and the extended powers must be again near lapsing. Another pier project followed. This pier was to run out from Knightstone, but, like the proposals for electric trams running parallel with the promenade, a big wheel, and so on, it fell through. To construct marine lakes such as they have at Southport was another ambition, but, beyond illustrations in the local papers and various surmises as to the outlay, nothing came of it.

The great impediment to the improvements, good and bad alike, has been the cry of the tripper. Weston's all-pervading bogey has been the tripper, and anything that suggested an encouragement to him was cried down. There is still the excursionist bent on an out-and-out day's holiday who makes a mad rush for the sands at the end of Regent Street, and patronises every imaginable penny gaff, but there are others who spend their evenings in Weston, who do not find donkey rides and halfpenny ice-creams, consumed without the aid of spoons, indispensable: and it is for these latter that provision is now to be made. The first step has been to provide a pavilion. Knightstone, the site of the swimming baths, was acquired by the town some years ago, and here a good deal of money has been expended on improvements in providing a pavilion and up-to-date swimming baths. To prepare a site for the pavilion a retaining wall was built, which increased the area of Knightstone by a quarter. The pavilion will be a great acquisition to the town, especially as a thoroughly modern convenient building is being put up. There will be accommodation for 1,200 seats besides promenading space, good stage-room, convenient waiting-rooms, cloak-rooms, and lavatories. There are two floors. The concert hall is 100ft. long by 67ft. wide, with a gallery running round. The building itself is a solid structure, in which there will be a good deal of terra-cotta work. Beneath the pavilion a large settling tank has been excavated, in which sea water will be stored for the supply of a modern swimming bath, which the Council are going to build in proximity to the pavilion and adjoining the present baths. The bath will be 100ft. by 35ft., and will be provided with eighty-four boxes, club dressing-rooms, and a three-side gallery. This, too, will prove an acquisition for Weston, where the provision for aquatic sports and polo matches has not been the most admirable. The new baths will have accommodation for 400 spectators. The expenditure involved on the pavilion will be about £10,000, and the work will be finished this season, but the new baths will not be ready until next year.

Upon the promenade a series of improvements are being effected. Chief of these is the alteration of Madeira Cove. The curve is to be accentuated, so as to give more seating accommodation and greater promenading space, whilst a smaller cove will be made on the other side. The Council have purchased a portion of the gardens adjoining the promenade between Madeira Cove and Anchor Head, which they will utilise in widening, and at Anchor Head or Pebbley Beach a kind of transformation is being worked. The surveyor (Mr. H. Nettleton), who is carrying out the work, is providing rockeries, &c., so as to give the promenade as varied an appearance as possible.

COLD STORAGE.

THE PRINCIPLES OF CONSTRUCTION.

THE preservation of dead meat and other eatables for lengthened periods of time has lately become a matter of great importance to all classes of the community.

What was thirty or forty years ago a luxury in the form of ice safes, used only by a few high-class provision-dealers, butchers and fish salesmen, has become a matter of common usage.

From the builder's point of view, it is a matter of comparative indifference what system is adopted in cooling or chilling the meat. His task is to so build the cold store that outside heat may not get inside so as to neutralise the cold superinduced by the plant and machinery of the establishment, and, what is of perhaps equal importance (for a greater expenditure of energy on the part of the plant and machinery can generally, though at unnecessary cost, make up for the builder's defective insulation), to exercise such care in regard to his foundations and interior walls that no smell or damp or other deleterious elements may, from the outside or from the composition of the walls, reach the interior of the chambers where the meat is stored. If the builder fail in this, then, in proportion to his failure, so is thrown away the genius and care of the engineer who has put down the cold-producing plant and machinery.

That the builder may the easier grasp his problem, a short description of the principle and application of cold production may be given. Cold or absence of heat is arrived at in nature, as well as artificially, by a process of porterage. Gases absorb heat and carry it with them in great volumes, and very rapidly : so will liquids. Thus, if you place a lump of ice in a warm room, it will melt under the heat, and the melted ice —water—will take away with it a great proportion of the heat used in bringing it into liquid. If the water be taken away from the room, the room will be by so much cooler, not by reason of the ice left in the room, but because of the heat absorbed and retained in the removed water. If the builder so constructs the room that no additional heat can get in to take the place of that retained in the water, he has effectively done his part of the cold store, as far as insulation is concerned. Now, variable winters affect the ice harvest and its costs just as variable seasons affect the harvest and cost of corn ; but mechanical refrigeration (or better called "artificial") pursues its level way indifferent to the seasons almost—always allowing that heat or cold, in so far as either calls for more or less artificial effort, naturally affects the total cost of a year's working ; yet the cost per unit does not vary with artificial cold as it does, and must do, with natural ice.

The principle most in favour now is the gasification of ammonia, sulphurous acid, or carbonic acid. The cooling agent is first compressed. The compression imparts heat to it, so that when it is freed from its compressed state it flies off in gas and speeds through the piping (gas-tight, of course) judicially distributed through the room that is to be cooled, capturing (absorbing) heat in its course, and ultimately being led out of the cooled space to be in its turn condensed in cooling coils, by parting with its acquired heat to the circulating cold water in which the coils are placed. It, the cooling agent, is then once more ready to be compressed and sent on its heat-capturing mission through the cold room or store, as before. That is the direct expansion principle. Another way is to use ice or the gas to cool a quantity of salt water (brine) in a vat. This, when cooled (not being noxious like the gas), may be run naked in open channels through the cold store, absorbing heat and moisture as it goes on ; leaving the cooled stores it gets rid of its heat, and recommences its course. Thus, like the gas, going in a perpetual circle, just lingering at one part on the way to get its heat taken from it. Thus is cold produced, subject naturally to the various modifications that the fancies of the proprietors or engineers, in their never-ceasing endeavours to improve things, may introduce.

The rest of our observations will be devoted to the construction of the foundations and walls of cold stores, in regard to which must be kept in view not only the exclusion of heat, but also the exclusion of vapours or smells emanating from the outside, or even originating, as is frequently the case, in the materials used in the construction of such foundations or walls. This latter is of much greater importance than appears at first sight ; for it has been proved by technical commissions, appointed *ad hoc*, that the almost imperceptible odour of foreign stuffs, healthy or unhealthy, is greedily taken on by the meat, which so tastes as to "spoil its market." So much is this so that the goods stored have to be classed and stored in separate chambers. Fruit should not be stored with meat, else the latter may taste, say, of apples—and so on. It is obvious, therefore, that the builder of a cold store must see to it that the interior surfaces of his cold-store floor, walls and ceiling are so faced that nothing not specially introduced may come into contact with the articles stored.

It is obvious that, in the matter of a cold store, site counts for much. The situation should if possible be dry, high lying where convenient, and yet as little exposed to winds and sun as possible. In a large town a site cannot easily be chosen, however.

It must be admitted that cold stores do not, as a rule, boast much architectural beauty. Stores of any kind do not generally pretend to anything but the largest possible efficient cubic contents for the cost of enclosing the same. As a matter of fact, the only peculiarity in a cold store, from the builder's point of view, is insulation. This, however, if properly carried out, means an immense reduction in space available as compared with non-insulated stores. A fire-proof safe is a fair example of what has to be done to insulate a cold store, and the material used to prevent fire reaching the documents in the safe may likewise be used to maintain a cool temperature in a cold store : that is, prevent the exterior heat from entering. Perhaps we should observe, parenthetically, that, once the store is cooled, it must not be supposed that all the heat to be "kept down" comes through the foundations, walls, windows or roof. The goods stored give off much heat, and that has to be taken away. But such removal belongs to the engineer's province, not to the builder's.

The site for the cold store having been chosen, the foundation is the next consideration. The insulating mediums are various, and the changes are rung with them according to the fancy of the architects. The following foundation was laid for the Dundee Cold Stores : A bed of dry ashes ; 6in. of concrete ; 1in. of bitumen ; 9in. of granulated cork ; and $1\frac{3}{8}$in. white-pine flooring boards tongued and grooved. Here we have 1ft. $5\frac{3}{8}$in. of insulating material between the interior of the store and the ashes, which may be any convenient thickness.

At this point it may be well to give an idea of the comparative insulating value of different materials. The specialist organ for refrigeration called "Ice and Cold Storage," in its issue for April last, published the following table showing the relative heat-radiating power of six materials compared with a brick wall, all 6in. thick :—

	Heat Units.
Firewood - - -	4·0
Cork chips - - -	2·6
Charcoal - - -	2·6
Sawdust - - -	2·2
Wood ashes - - -	2·0
Cotton - - -	1·4
Brick wall - - -	6·2

Of course, the chief danger from the foundation is moisture. The earth is more likely to absorb than to radiate heat.

Another table taken from "Ice and Cold Storage" (July 1899), based on a different system of calculations, shows (as can be seen by reference to those materials mentioned in both tables) that they bear practically the same relation to each other under both tests,

Relative Conducting Power for Heat as shown by the test of Melting Ice.

Silicate cotton - -	100
Hair felt - - -	117
Charcoal - - -	120
Wood shavings - -	125
Gasworks breese - -	230
Wood and air space - -	280
Sheep's wool - - -	136
Infusorial earth - -	136
Sawdust - - -	163

It is not to be supposed that, having established the most efficient heat insulators you can at once proceed with your foundation. The insulator may be of or contain an evil-smelling agent. In such case the greatest care must be taken to so dress the surface of the floor as to prevent such odour penetrating into the cold store, and careful dressing does not always settle the matter, for the constant foot traffic over the surface will soon wear holes in the upper skin of the floor (unless covered with wood), and so let in the smell perhaps of tar bitumen, which will soon render the stored meat so "tasted" as to make it unsaleable.

The accompanying illustration (Fig. 1) taken from the June, 1899, issue of "Ice and Cold Storage," showing section of foundation and walls of a Canadian cold store, conveys in itself a whole bookful of cold-storage information. For the foundation we have 12in. of cobble or broken stone ; 6in. sawdust ; 1in. rough boarding ; 2 layers of building paper ; and $1\frac{1}{2}$in. wood flooring ; total, $22\frac{1}{2}$in.

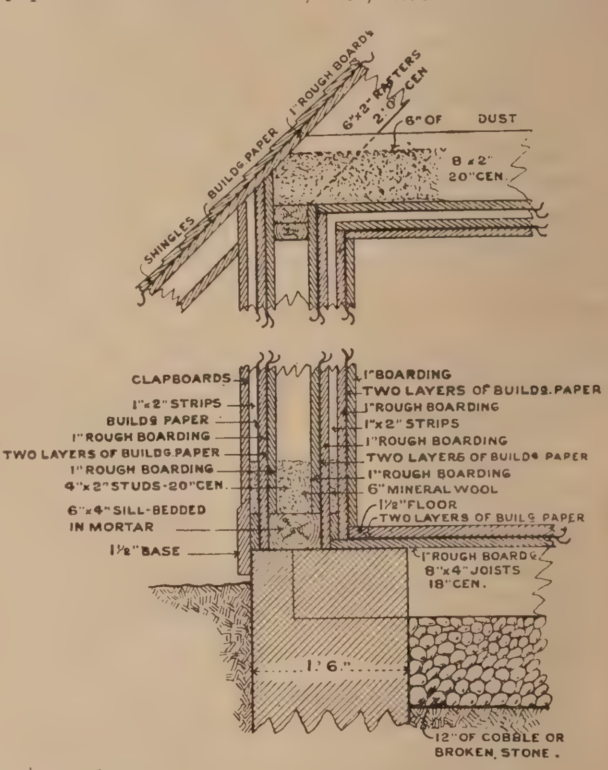
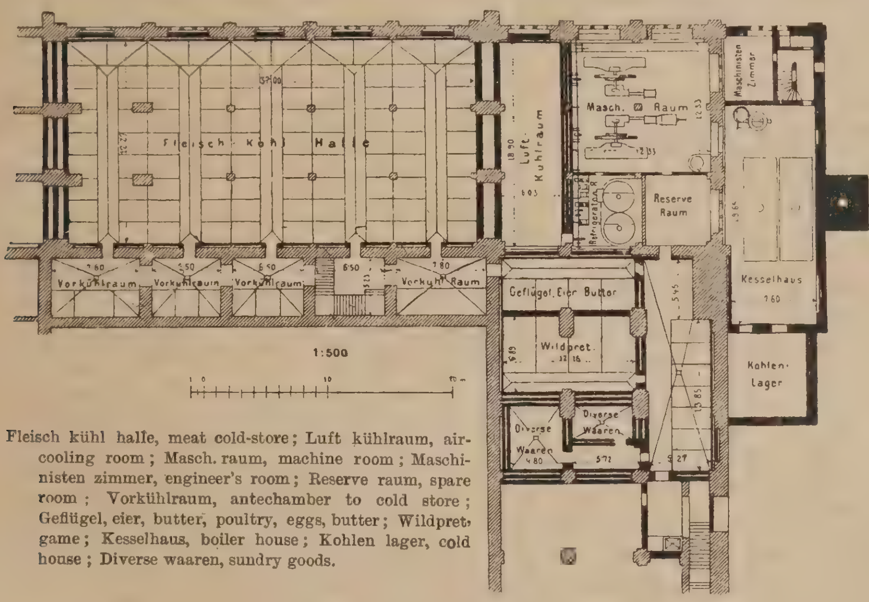


FIG. 1. SECTION OF A CANADIAN COLD STORE.

This for a foundation under the floor is not always thought to be enough. Some German authorities—and in Germany cold storage is as far advanced as anywhere, at least technically—require a full yard of insulation, largely concrete between the floor and the earth. Of course the foundations of the walls must be built solid to support great weights, and do not admit of the series of materials that may be chosen to go beneath the flooring. Solid masonry or brickwork naturally takes its place here, and must be accepted as the insulator, with such aids and felt as can be conveniently combined with it.

Now, before we leave the foundation, let it be carefully borne in mind that cold air being heavier than warm air, the cold-storage room should be lower, if anything, than the cold-generating room, be it by ice or gas, except where direct expansion is employed ; for, naturally, if the cold air lie lower than the store to be cooled, the said air will remain and refuse to circulate. It is sometimes otherwise arranged so as to obviate the condensed moisture in the cooled air chamber finding its way by gravitation into the cold store. But as the eminent German authority, Constanz Schmitz, points out, a properly-built cold store will be so waterproof, where required, as to make such a consideration wholly indifferent. One point particularly remains to be mentioned before passing on to the walls, and we cannot do better than quote Dr. Schwartz, probably the best living authority on the hygiene of cold-storage building. He says: "The position of gutters, gulleys and drains has also a substantial influence on the cold room air. The more care the builder of the cold room gives to this the better it is for the working. It is, of course, indispensable to have a sufficiently smooth and slanted floor, as also gutters correspondingly inclined. The gulleys, too, must be cemented at the bottom, and not, as I have occasionally found them to be, only walled holes without a solid bottom, allowing, of course, the waste water to easily sink into the ground and become a permanent source of bad smells. A good water trap should not be wanting."

The walls of the store now claim attention. The most perfect insulator known is dry still air. Therefore, a wall built containing a hermetically closed dry air-space is an ideal cold-store wall; but it must also allow for renewing the air contents. This will always shrink, and the wall is a very delicate one to make. We refer, then, back to the illustration, Fig. 1, to show a good well-studied insulation. There is:—1in. boarding interior; 2 layers of building paper; 1in. rough boarding; 1in. strips by 2in.; 2 layers of building paper; 1in. rough boarding; 6in. mineral wool. From the mineral wool to the open air we refer the reader to the section referred to. Of course, every wall, *i.e.*, including partition walls, must be an insulating wall, though the exterior walls most call for attention. It is a common thing, as in the principal Glasgow Cold Stores, George Street, to adapt an old building to the purpose. In such case the insulation becomes rather a carpenter's job. It is done inside, and most seriously reduces the cubic contents of the store. But, it is well to bear in mind, a cold store should not be larger than is required; for a deal of "cold" is thrown away where a larger cubic measurement is refrigerated than is needed. We need not dwell further on the walls. A builder's or a proprietor's fancy or desire to experiment will naturally suggest variations in insulation. Where the interior wall surface is cement, this should be carefully dressed wet. After thoroughly drying, such a surface will not permit either wet or smell to penetrate. But when we get to the roof on which the sun beats, there is no harm in having about 3ft. of insulation between the interior and the open air. It would be idle to recapitulate the names of the insulators that may be used. Slag wool should, however, be always considered. Wood shavings, cork shavings and sawdust also follow close on, in point of efficiency. Where slag wool is used it should not be crushed, thus destroying the air cells. One of its virtues, if not its chief, is the air it holds in suspense and consequently still. Damp or moving air will carry heat; dry still air will not.



Fleisch kühl halle, meat cold-store; Luft kühlraum, air-cooling room; Masch. raum, machine room; Maschinisten zimmer, engineer's room; Reserve raum, spare room; Vorkühlraum, antechamber to cold store; Geflügel, eier, butter, poultry, eggs, butter; Wildpret, game; Kesselhaus, boiler house; Kohlen lager, cold house; Diverse waaren, sundry goods.

FIG. 2. PLAN OF COLD STORE AT VIENNA.

Having at some length considered the essential elements of a cold store, we now consider a general plan. To gather information and guidance from a variety of sources, we will, instead of citing British stores, show the ground plan of the fine cold store recently opened at Vienna (see Fig. 2). For the convenience of readers, the German words appearing in the illustration, are translated below it. Little will thus require explanation. But the Vorkühlraum (porch) must be insisted on. This is a chamber, or series of chambers, leading into the cold stores, to obviate the latter being in direct contact with the open or other warm air. Otherwise the opening and shutting of the cold-store doors to receive or give out meat would mean the admission of a large volume daily of outside, and perhaps impure, air. The porch, therefore, though empty, is not thrown away, although it looks like waste space. Recently-built cold stores, such as those at Lochrinn, Edinburgh, do not omit this receiving room. The parallelograms shown in the body of the cold store represent lattice work chambers. The room is so divided to admit of spaces being let off to private people at so much a year. A butcher is thus able to secure for a period a fixed space communicating with one of the passages which run across the store, just as he might rent a house or room. In all other respects, bearing in mind the insulation which is not shown in this plan, it (the plan) speaks for itself.

It would lead us further than the limits of this article will allow to explain the arrangements to be made for cooling the air or brine, conveying it through the cold store, and getting it away again. One principle must be borne in mind. Cold air and brine will circulate by gravitation, and when wanted back must be forced back. Therefore, the "cold" should be higher than the store to be cooled; it is then optional on the part of the proprietor to reclaim the heated cooling agent, which he does in the case of brine, or to let it escape, which he does in the case of cooled air, which becomes over-heated in circulation; and it pays better to cool fresh air. Gas or acid, of course, he never lets slip if he can help it. It is always brought back, cooled in coudenser coils, re-compressed and returned to its work of catching up and carrying away heat.

As the cold store here illustrated is one of the best on the Continent, let us refer to the insulation of its foundation, *i.e.*, under the floors.

The ground was excavated to the depth of a metre (39in.). A 50 centimetre (19½in.) layer of clay was put down. Over this followed 30 centimetres of coke, then 15 centimetres of concrete, and lastly, 2 centimetres of asphalt. In the walls 10 centimetres space was allowed for air.

The power supplied to this store is steam, and the refrigerating machine, by carbonic acid, is equal to 135,000 heat units per hour, besides reserve power, about half the foregoing. The total storage superfices, exclusive of passages, is 821 square metres. The store is fully described and illustrated in "Ice and Cold Storage," May issue, 1899.

Light must also be seriously considered. Daylight is the best. It is most easily diffused. Electric light is the clearest artificial light, but, unfortunately, it throws very dark shadows. Gas and oil, because of what they give off, are practically inadmissible. Acetylene has still its spurs to win; its smell is "impossible." Generally electric light is the illuminant chosen, and as for the dark shadows, they must be closely watched. Let the cold store have as few as possible; for where darkness is, there filth gathers, and filth is a mortal enemy to a cold store.

As to the upper floors, they follow pretty much the lines of the ground floor. Frequently this latter is only used for loading and unloading, and for making ice blocks; the cold store proper being from the first floor upwards. In such cases the communicating areas, lift wells, &c., all require either isolation or to be the direct medium between the receiving room below and the store above. The receiving room must be cooled and insulated.

It is not generally known how rapidly cold storage is becoming a great industry. Scarcely anything perishable escapes its attention. The beef and mutton—not to say the game—of Australia is killed there and brought to Europe in refrigerated chambers on board ship, to be cold stored here till wanted, in quantities that would be incredible to the uninitiated.

Summer plants and flowers likewise are kept in ice to deck the rich man's dinner table in winter. The cold store brings the Canadian and Danish dairyman into almost direct communication with the British consumer—the cold store only intervening. The construction therefore, becomes of yearly increasing importance. Many eminent chemists and engineeers make the economical production of cold a constant study, but as yet only a few builders have made a study of helping the chemists and engineers by building houses that will admit the minimum of heat during the time they are in use. An eminent chemist some time ago said that, next to electricity, cold storage is the new industry that has made most progress during the last twenty-five years. As farming decreases in the country, and towns grow in size, the cold store becomes an institution that a new race of builders will take in hand if the existing ones do not at once include it in their regular series of calculations.

VICTORIA HALL AT CALCUTTA.

THERE is a very general feeling among Anglo-Indians and the thinking portion of the native community that a grave mistake is being committed in the adoption of the form which is proposed by Lord Curzon for the Indian National Memorial to the Queen. The unprecedentedly large subscriptions which are pouring in are to be devoted for the most part to the erection of a Victoria Hall in Calcutta. This hall will be simply a museum to house a scanty and insignificant collection of pictures, statuary, and objects connected with the history of India. These things are to be "commandeered" from such of their present owners, whether public bodies or individuals, as are weak enough to give them up at official instigation. In addition, there is to be a public garden (which is not in the least wanted) and an ornamental pedestal for the existing statue of the Queen. The result will be that Calcutta will be endowed with a large purposeless building, visited by a few European loafers and coolies. There is no reason to believe that as a work of art it will be much more successful than the average British attempts in this direction. In other words, it will be architecturally contemptible, an absurdity and incongruity in the Gothic-Saracenic or other bastard style. Calcutta, though it is the seat of government for four months in the year, is not visited by well-advised travellers except for social and business purposes. Its own residents do not care about the proposal, and grudge the space to be taken away from their great breathing ground, the Maidán. Anyone acquainted with India will know that in a question of this sort the only safe line is the utilitarian one; and some philanthropic work would be the best memorial, such as new hospitals.

THE TRAINING OF THE YOUNG ENGINEER.

Mr. MAW'S SOUND ADVICE.

IN the course of his presidential address before the Institution of Mechanical Engineers, on April 19th, Mr. William H. Maw spoke of the technical training which it is desirable should be given to our young mechanical engineers. He

I am particularly desirous that any criticisms which I may make bearing on the methods of teaching adopted at our technical colleges should not be interpreted as indicating any doubt whatever on my part with regard to the great usefulness and general efficiency of such institutions. On the contrary, I have the highest respect for the excellent work they are doing, and I regard them as absolutely essential to the proper training of our rising generation of engineers. But technical colleges are institutions of comparatively recent growth in this country, and I think that no one who has studied their methods would claim that they have even approximately reached perfection. Nor is it reasonable to suppose that such an end could have been attained.

To use a railway metaphor, the technical college may be regarded as a kind of cross-over road, diverting the student from the line of scholastic training to that of independent thought and action, on which he will have to make his way in the battle of life.

Useless Learning.

Nothing is more disheartening to a student than to find at some stage in his career that he has been devoting time to learning things which are not only useless to him, but which it is really desirable that he should un-learn; while, on the other hand, he has failed to acquire knowledge of which he stands badly in need. Yet this is a far too frequent experience with boys entering technical colleges from our public schools. Matters are, I am glad to say, improving in this respect, and many of our large schools are conducted on less hard-and-fast lines than formerly, and are thus materially aiding the technical colleges in the early stages of their work. The changes, however, which have so far been made in this direction are of a very limited extent compared with those really required, and there is still left to be done at the technical college much educational work which ought to have been done at school, the result being a waste of valuable time. This matter is one which merits the most careful attention of all interested in technical education.

Specialising.

At present the practice in most of our colleges tends to effectively introduce students to a very limited number of the branches of mechanical engineering; the consequence being that young men flock into departments of the profession already crowded, or, if they enter less popular branches, find themselves to a great extent without that special preparation for their career which it should have been the object of their college life to supply.

No one is more opposed than I am to the too-early specialising of a young engineer's training. To specialise too early means, generally, a narrowing of the field of view which is most detrimental to future success. Moreover, it is not until the engineering student has made substantial progress in his studies that he is really in a position to determine for which branch of his profession his predilections, his ability, or his opportunities best fit him.

But there comes a time when every engineer must specialise, if he really wants to attain anything more than a subordinate position; and my view is that this specialisation had better be at least commenced during the college career rather than subsequently—the student devoting the latter part of his course at college to the acquirement of a knowledge of the special principles which underlie practice in the particular branch of his profession to which he is about to devote himself.

The Study of Constructive Detail.

A point to which the attention of engineering students should be very specially directed during the later portion of their college training is the necessity for the careful study of constructive detail. Perfection of detail is the very essence of successful mechanical engineering practice; and to the careful observer, the study of a boiler which is being broken up, or of an engine or machine which is being stripped for repair, will afford an endless number of lessons of the greatest practical value.

SOCIETY OF ARCHITECTS.

ANNUAL DINNER.

THE annual dinner of the Society of Architects was held at the Prince's Restaurant, Piccadilly, W., on Wednesday evening last, Mr. T. W. L. Emden, L.C.C., presiding.

After the toast of "The King, the Queen, T.R.H. the Duke and Duchess of Cornwall and York, and the Royal Family" had been given, Mr. Silvanus Trevail, J.P., F.R.I.B.A., rose to propose "The Houses of Parliament." In the course of his speech he referred to the question of architectural registration. They looked to the members of Parliament present to help forward this measure with all their might, for it was imperative that architects should be registered. It was so in the Colonies, in America, in Germany, and it should be so here. Mr. E. Goulding, M.P., replied.

The next toast on the list was that of "The Clergy." In proposing this Mr. Edward Terry was most happy. He did not quite know, however, why he had been so honoured—perhaps they thought that, as an actor, he had a grievance against the clergy—he might say a number of nasty things about them. The clergy, however, were his very good friends. He himself had even been a churchwarden; but this was in a play he had translated from the German!—The Venerable Archdeacon Sinclair, D.D., replied. He thought it would be very helpful to clergymen if architects explained their plans to them; this would avoid much misunderstanding. With regard to London, he felt there was not much encouragement for the architect in modern church-building, because it was so necessary to erect churches which, whilst being large, were to be cheap; but special attention needed to be devoted to architectural acoustics, exits and outlets, ventilation and lighting—after the Oxford Movement the last-named seemed to have been considered an improper element in churches! He asked for the sympathetic criticism of architects in regard to the decorations now proceeding at St. Paul's Cathedral. The golden gallery was gradually creeping around the building, though it was entirely out of harmony with Wren's motives; and he did not approve the painting of the stonework, which possessed itself a charming surface. In conclusion, he much regretted that commercial requirements should so dominate architecture, and mentioned Edinburgh as an example where—not on account of its site, but because of the care of its architects and the municipal authorities—every street had been given a beautiful aspect.—The Rev. Dean Langton George Vere also replied to this toast. Baalbus, he said, was building a wall. But in the Latin *murus* meant not only the wall of a city, but the wall of a house. Baalbus continued to build this wall—he was always building it—and the speaker felt that Baalbus must have been a very great architect. He would be glad to know of any posthumous works of Baalbus! The clergy and the architects were alike in many respects; for instance, they were both designers—the clergy were often called designing men—and they both had to put up and to pull down.

"The London Authorities" was the next toast on the list. Mr. H. S. Samuel, M.P., proposed it, and Mr. E. A. Cornwall, J.P., L.C.C., replied. Mr. Cornwall referred to the fact that the London authorities had been reduced in number from 42 to 28, which must make the work of architects easier. He thought the London Building Act, with all its faults, had proved very workable, and considered it was to the credit of the London County Council that they had the welfare of architecture so much at heart; £80,000 could be saved if the church of St. Mary-le-Strand were removed, but the Council ruled otherwise.—Mr. J. Hunt (Town Clerk of Westminster), who also replied, said that the London Government Act had really reduced the 78 vestries and 12 district boards to 28 local authorities, with only 28 sets of officers; and had substituted 1,360 councillors and 250 aldermen for 4,000 vestrymen and 600 members of district boards.

The next toast, "Prosperity to the Society of Architects and Architecture," was proposed by Sir Wyke Bayliss, F.S.A., in a very poetical speech. He thought one of the greatest pleasures to the artist in London—in which term he included the architect—was that afforded by the meeting together of the great societies. They reminded one of the old guilds of Venice, Florence and Rome. All artists had one common aim—the pursuit of beauty; and in this connection he referred to the story of the castle said to be haunted by the spirit of the lady who was formerly its mistress. The children saw her, and said, "She is like us"; her lover saw her, and felt the same impression; and the old men saw her, and said that she was like what the Madonna must have been when she had grown a little old. Phidias had seen the spirit, and there was a Parthenon; Raphael, and we had a Madonna; Turner, and there was the "Fighting Téméraire" being tugged to her last berth; and it was because architects were looking at this vision that he proposed their health.—Mr. Emden replied. He said the work of their society was twofold—first, to enforce registration, and, secondly, for the encouragement of the art of architecture. Referring to the Queen Victoria Memorial, he expressed the opinion that the competition should have been thrown entirely open. The selected men were well known, but others should be given a chance, even though this might entail extra work on the Committee in having to make a choice from a great number of designs. He thought a great misunderstanding arose about "styles" of architecture. Men got wedded to one particular style, and could see no good in any other. This, he felt, was a great pity, especially in London, which owed so much of its picturesqueness to the variety of treatment in its buildings.

A pleasant evening was brought to a close by the toast of "The Visitors," proposed by Mr. W. W. Thomas (vice-president) and responded to by Mr. W. J. Bull, M.P.

A WORD FOR THE JERRY-BUILDERS.

By A DOCTOR.

SPEAKING recently at the annual meeting in connection with the Crownhill Convalescent Home, Dr. C. A. Hingston asked why was it convalescent homes had become such a necessity during the past thirty years? In the early part of the century England, with the exception of London, was wholly rural. There was no crowding into towns. The towns were more like villages, there was plenty of fresh air everywhere, and the population was scattered all over England. From about the date of the Reform Bill people began to crowd into the towns, and that had been going on steadily, not only by the increased population of the towns, but the country districts had been steadily denuded of their inhabitants. It had become a very grave question how to deal with that population which was crowding in increasing numbers into their towns. They heard of the building of houses for the working classes. He had had some experience of it, but he said it was impossible at the present rate to build houses for the working classes and build them well for a return of more than 2½ per cent.

They had heard the jerry-builders extremely abused, but he thought those builders were great public benefactors. Were it not for them he did not know how the population could possibly be housed. The jerry-builders had another great advantage. The houses were so badly built, and so cheaply run up, that they could afford to let them at rentals which well-built houses could not be let at. He was not quite sure that a poor building was not advantageous in other ways. When doors did not fit closely and windows were badly made, repairs were constantly needed, and they got good ventilation. He thought the jerry-builders were benefactors, certainly in the case of their town and their neighbourhood—(laughter and "How about the drains?"). The Sanitary Authorities of the towns were bound to see that the drains were right, and he supposed they did their duty, and that the houses were well drained. Far from cursing those builders they ought to bless them. What would London do without them? The population of London would be helpless were it not for the jerry-builders.

QUEEN VICTORIA MEMORIAL.

SPECIAL MEETING OF THE R.I.B.A.

ON the written requisition of twelve subscribing members, a special general meeting of the Royal Institute of British Architects was held on Monday evening last to consider the matter of the Queen Victoria Memorial. Mr. E. A. Gruning (vice-president) occupied the chair.

The secretary read a letter from the president (Mr. William Emerson) in which he stated that when the two committees—Lord Salisbury's Committee and the Executive Committee—discussed this matter three points came before them. The first, as to whether an architect of eminence should be selected to prepare designs; the second, as to whether there should be an open competition; and the third, as to whether a few men should be selected to prepare designs and be remunerated for their trouble. The Committee, after discussion, had adopted the last course.

A letter was then read from Mr. J. Macvicar Anderson in which he entered a strong protest against the object for which this meeting had been convened. It was a matter of opinion what might have been the best course to adopt, but this was not the point of his protest. If the nation desired that it be left open to all to submit suggestions, let this be expressed through the nation's representatives or the Press. He felt that the very last body to deal with it was the Institute, for this would be tantamount to asking that those of its members who had not been invited to submit designs should be permitted to do so, and anything more undignified or unprofessional he could not conceive.

At request two other letters were read expressing opposite views, one from Mr. Philip A. Robson.

Mr. Woodward's Resolutions.

Mr. William Woodward then rose to submit the resolutions he had prepared, but before doing so he thanked the Council of the Institute for allowing them to meet at the earliest opportunity. His resolutions, which, however, were only put forward as tentative, were as follows :—

1. That in the opinion of this meeting the proposed National Memorial to Queen Victoria should be open to the competition of all British—including of course Colonial—architects, sculptors and artists.
2. That the first designs should be in the hands of the committee at the date already fixed, namely, the end of June next—and that from those designs six should be selected, the authors of which should be engaged to perfect their schemes, and submit them at a date to be decided upon by the committee.
3. That the author of the design selected from the six should be employed to carry out the work in collaboration with the sculptor or sculptors whom the committee may designate.
4. That in the event of the Memorial being thrown open to general competition, as above suggested, the information furnished to the five architects already appointed, for their guidance in the designs, be immediately made public.
5. That the whole of the preliminary designs, as well as the subsequent perfected designs, be publicly exhibited.
6. That these resolutions be at once transmitted to the Viscount Esher with a request that they be laid before His Majesty the King.

Referring to the letters read by the secretary, he said with regard to Mr. Macvicar Anderson's that such opinions were only to be expected from one who had attained the position of having arrived at the end of a very fine career; for he (Mr. Anderson) would view any efforts on the part of the younger generation as unconservative. That feeling, however, did not dominate his breast, nor, he thought, the breasts of many there that evening. They were desirous of showing that art in this country was not on the ebb, but on the flow; and among the younger men there must be great talent only awaiting opportunities like that of this memorial. If the Press were ever unanimous on any subject, it was this one. Even the "Times," in an inspired—though very fair—leading article, while deprecating the open competition, said that the nation desired this one to be so conducted.

The funds for the memorial were public funds, and it was only natural that the public who subscribed them should wish to have some share in deciding what use they should be put to; and the public had said that the competition should be open.

There was a general committee and a sub-committee appointed to deal with this matter, the president of the Institute being among the members of the latter. But the president gave them no information as to what had taken place, and no efforts had been made to ascertain what the opinions of the Institute were.

The chairman here remarked that the president, as a member of the committee, could not make public what had transpired.

Continuing, Mr. Woodward said with regard to the five architects chosen, that it was impossible for any of them to know more than any other five architects about the particular character of this memorial. If it had been a cathedral or an asylum, or a hospital, for which work five architects had proved themselves to be specially suited, it would have been different; but in this country no one architect, and certainly not five, had had an opportunity for an exhibition of the qualities needed in this particular design.

It had been said that open competitions involved a great deal of trouble. He was not so sure, however, that the committee would be overrun with designs, and, even if they were, it would be an easy matter to separate those which were of worth from those which showed no merit. As the results of open competitions he mentioned the Paris Opera House and our own Houses of Parliament, which we never otherwise would have had. Therefore he contended that, in order to get the very best talent available for this memorial, the competition should be open.

Professor Beresford Pite said he was heartily in sympathy with Mr. Woodward's remarks, but did not think it quite advisable to put forward the resolutions in the manner suggested. He would therefore propose an amendment.

The chairman pointed out that Mr. Woodward's resolutions had not been seconded. A member therefore seconded them, and in doing so expressed the opinion that it was a pity the Institute had not itself called a meeting of its members to discuss the matter. The majority of them had been taken completely by surprise. The country seemed taken by surprise, for the scheme had been greatly hurried, and very little was known about what had taken place.

Mr. Pite's Amendment.

Mr. Pite then moved his amendment, which was as follows: "That considering the deep and widespread interest manifested throughout the Empire in the proposed National Memorial to Her late lamented Majesty Queen Victoria, and in view of the limited opportunities for the exercise of monumental design in London that have been offered during recent years, and the absence of useful precedent, this special general meeting of the Royal Institute of British Architects, of which Her late lamented Majesty was patron throughout her long reign, respectfully urges upon the Executive Committee of the National Memorial its earnest conviction that designs should be invited in open competition from all British architects for this most important and unique monument, which it hopes would thus become representative of the best and most enthusiastic efforts of modern monumental architectural art; and further this meeting would suggest to the Executive Committee the necessity of affording sufficient time for the preparation and submission of designs by architects resident in all parts of the Empire, of whom many are members of this Royal Institute."

Referring to the president, he said he was sure he had done everything he possibly could in the interests of the profession; and he was of course perfectly right in not revealing what had transpired privately in the committee of which he was a member. At the same time he thought it was quite justifiable for them to discuss the matter. If a mistake had been made surely it ought to be rectified. A certain dean and chapter of one of our finest cathedrals invited an artist to spoil it—officially; but that was no reason why a protest should not be made. He felt the committee's mistake had been one of judgment, not one of form or manner.

With regard to competitions as a whole, he thought it should be borne in mind that it was their abuse that was objected to; and if there was no abuse there would be no use; but the abuse was not to blind our eyes to the fact that they also had a use. He referred to the enormous waste of money caused by competitions, but in this case that question was not concerned. He mentioned to the competition which [illegible] produced the only fine monument of our era—the Wellington Monument in St. Paul's Cathedral, by Alfred Stevens. The finest monuments the world has ever seen in all ages, he said, had been attributable to open competitions, and he did not think they ought to be stamped out now because they were subjected to abuse in small particulars.

Mr. H. V. Lanchester had great pleasure in seconding Mr. Pite's amendment. He said they were quite within their rights in discussing this matter, for every chance should be taken in order to secure the very best they could obtain.

Mr. Wimperis thanked Mr. Woodward for bringing them together that evening, but thought they should try to deal with the matter without personalities. The five architects selected had done much for architecture, and had helped to found a school which the younger men would establish in due time. But other names occurred to them which should be included. So eminent an architect as Mr. Norman Shaw had expressed the opinion that this competition should be entirely open, and he did not think any body of architects could afford to ignore such an opinion.

Mr. Frampton thought they had treated the Colonies badly. In matters national we were going backwards—back as a nation, and back in our arts. He asked for the "free trade" in Art that characterised the Paris methods; if there was a difficulty about assessors, why not have juries? But he was ruled out of order by the chairman.

Mr. Maurice B. Adams agreed with the remarks of Mr. Pite, but felt that a great mistake would be made if they carried the resolution. It was no use hitting unless you could hit hard. Their president was a member of the Committee, and he was perfectly certain Mr. Emerson had done his utmost. He cautioned them to think carefully over what they did, for they might do more harm than good.

Mr. Woodward said he was quite willing to adopt Mr. Pite's amendment, as his only object was to obtain an open competition. Therefore, he begged leave to withdraw his resolution in favour of Mr. Pite's.

Mr. Silvanus Trevail said that they had good men in Canada and Australia, and it would be a great slight, considering how the Colonies had come forward over the South African War, to pass these over. He would not mind even if the competition were made open to the whole world.

Mr. Douglass Mathews, Mr. Lishman, Mr. Bonner, Mr. Tanner and Mr. Hudson then spoke, after which the amendment was put to the meeting and carried unanimously. By far the majority of those present were of opinion that matters had been kept too secret, and that, in the interest of architecture, the competition should be an open one.

Glasgow Municipal Buildings.—The decoration of the Banqueting Hall of the Glasgow Municipal Buildings has now been completed; the four panels painted by Messrs. John Lavery, Roche, George Henry, and A. E. Walton being unveiled recently.

Strengthening Balmoral Bridge.—His Majesty the King has given orders for the improving and strengthening of Balmoral Bridge, which during this month will be closed for the purpose, and his Majesty has commissioned Sir William Arrol in connection with the work. The contract for the improvement of the roadway over the bridge has been given to Messrs. John M'Adam & Sons, contractors, Aberdeen. The bridge will be laid with tar-macadam.

The New Baths and Free Library at Oadby, presented by Mr. G. H. Ellis, have been opened. The building is situated on the Leicester Road, and is built of red brick. The baths are placed at the back of the building, and entrance to them is gained through the front porch. The bath is 51ft. long and 24ft. wide, and the depth ranges from 5ft. 6in. to 3ft. 6in. White glazed bricks are used to line the bath. There are four slipper baths, two on each side of the entrance, and near them are the usual conveniences and the attendants' rooms. The library is placed upstairs, and the reading room, which is intended for women only, is a very light and well-ventilated apartment about 17ft. square.

SIR JOHN SIBBALD ON ASYLUM CONSTRUCTION.

AT a meeting of the Edinburgh Architectural Association last week—Mr. Henry F. Kerr presiding—Sir John Sibbald read a paper on the plans of asylums for the insane poor, looked at from the medical and administrative points of view. He said that asylums for the insane had now become so prominent among our national and municipal institutions that it was of great public importance that correct views should be held as to the kind of building which was best suited for them. It was at least helpful, if not absolutely necessary, for a proper understanding of such questions, to know something of the ground on which persons familiar with the treatment of the insane had arrived at their present opinions; and this knowledge could be best obtained by taking a general survey of the changes that had occurred in the character of asylum buildings during what might be called the modern epoch.

Sir John briefly referred to the kind of buildings in which the insane were lodged previous to the nineteenth century, and mentioned as illustrations the cells attached to the Charity Workhouse and the old Royal Infirmary, Glasgow. The duty of erecting asylums at the public expense was not seriously recognised in this country till the middle of last century, when the English Lunacy Act of 1845 and the Scottish Lunacy Act of 1857 laid this duty upon localities, and conferred on them powers for obtaining the necessary funds.

To illustrate the growth of opinion in regard to asylums since that time, Sir John first referred to the plans of the Derby County Asylum, which was opened in 1851. He then drew attention to the plans of the London County Asylum at Bexley, which was opened in 1898, and referred to the improvements which showed themselves in the more recent plan. Among these it was noticed that the several wards into which the accommodation for patients is divided no longer consist, as they did at Derby, of rows of cells in prison-like galleries, identical in plan, but that they are each specially designed for the patients they are to accommodate, according to the requirements of their different bodily and mental conditions—those requiring hospital treatment, for example, being placed in wards arranged like those of a hospital, and those in good bodily health, and whose mental condition does not require them to be housed differently from sane persons, being placed in wards of more home-like character.

He pointed out that this type of asylum, which he called the aggregated pavilion type, differed from the next type to which he drew attention, chiefly by the several wards being connected to other wards either by being portions of the same building or by the existence of corridors of communication. The type in which the wards consist of separate and independent buildings he called the segregated pavilion or village type; and he illustrated it by reference to the plans of the Prussian asylum at Alt-Scherbitz and of other more recently erected asylums of the same type. He gave a number of reasons which, in his opinion, justified a preference for the segregated pavilion or village type. Among these he mentioned the importance of making the buildings, and everything else about an asylum, as likely as possible to have a beneficial influence on the minds of the patients; and he showed that it was difficult to prevent a huge building which was neither a palace nor a manufactory from being both inside and outside gloomy and prison-like. He was also of opinion that where each ward was a completely independent building its arrangement could be made more efficient both from the general points of view of cheerfulness and health and from the special point of view of the adaptation of each ward to its own purposes.

He said that he thought the objections to the segregated buildings that had been raised from the administrative point of view were sufficiently met by the fact that they received no support from those who have had the actual administration of a village asylum. He alluded to the fact that it was proposed to erect the new Edinburgh Asylum on the village type, but did not make special reference to the Bangour plans, as they had not yet been finally adopted by the District Lunacy Board or approved by the General Lunacy Board.

In the course of the paper Sir John drew attention to the difference in practice north and south of the Tweed in regard to the courts surrounded by high walls which were at one time attached to asylums as well as prisons, and which are generally known as airing courts. He said that in Scotland the use of these airing courts had fallen into disfavour as early as 1869, and in that year the walls were removed and the airing courts abolished in one asylum. Since then the walls had either been removed, or lowered so much as to cease to be restrictive, in nearly every Scottish asylum; and in no Scottish asylum erected since 1869 had any airing courts been provided. In English asylums, on the contrary, airing courts were still in general use, and he quoted from the English Commissioners' reports to show that in at least three of the London County Asylums from one-fourth to one-third of the inmates never took exercise beyond the airing courts. He strongly advocated the abolition of these airing courts. Another point to which he drew attention was a recent movement—to which he gave his support—for the diminution of the practice of locking up in single rooms during night-time the noisy, the excited, and others of the more troublesome patients; and he spoke strongly in favour of the great increase in recent years both in the amount and the efficiency of the night-nursing given to such patients, and he showed how such a change in the mode of treating them should affect the plans of future asylums.

ARCHITECTURE AT THE ROYAL GLASGOW INSTITUTE.

THE exhibition of architectural drawings at the Royal Glasgow Institute this year is by no means of first importance as regards amount or quality. The frames number about fifty, and, with the exception of a dozen or so, all are of work erected or in progress: the remainder are drawings of old work, decorations or glass. The medium for illustration in most cases is pen work, but colour and wash drawings are also in evidence, and there are several photographs. "In accepting these the Glasgow Institute is wiser than the academies that exclude them," says the "Glasgow Herald," "for in many cases the camera gives the most faithful representation; of course, work not yet erected can only be shown by drawings. While principally from local sources, there are several contributions from English architects."

Churches.

Of local architecture in progress or recently finished, taking first ecclesiastical, of nine examples eight are Gothic, one only being Renaissance; and this proportion is not accidental, but may fairly be said to reflect the popular taste of architects and laity alike, who accept the traditional association without demur. The exception is the parish church at Lesmahagow (701) that Mr. A. N. Paterson has remodelled, adding a chancel, the furniture of which is particularly interesting.

Among the other church designs shown are "St. Kennett's" (697), by Mr. P. M. Chambers; Shawlands U.F. Church (700–760), by Messrs. Miller & Black; Sherbrooke Church (724–748), by Mr. William F. M'Gibbon; U.F. Church at Milngavie (703), by John B. Wilson; and a church by Mr. Quennell (746), the only English example shown.

Public Buildings.

Of public buildings, the new Parish Council Offices in George Street, Glasgow (717), by Messrs. Thomson & Sandilands, are the most important locally. Cardiff Assize Court Entrance (730), by Messrs. Lancaster, Stewart & Rickards, is in the Classic style, but a touch of originality is given here in the treatment of the entablature and in the use of rustication. Plumstead Municipal Offices (735), by Messrs. Wimperis & East, are also in the Classic, freely treated. A bank at Bromley (710), by Mr. Ernest Newton, possesses all the interest that this architect gives to every one of his works. Another example of Mr. Newton's skill is a garden entrance (713), very nicely detailed. 715–716 are photographs of part of the new Porte Buildings, Burntisland, by Swanston & Legge—a sundial is shown with this inscription: "I mark time; dost thou?"

Unsuccessful competition designs are frequently not the least interesting drawings in these exhibitions; but this year they are not so numerous as usual. Messrs. Watson & Mitchell's Glasgow Royal Infirmary (727 and 744) is the Jubilee block that was proposed to replace the present one by Adam, facing the square. Mr. Burnet's scheme for the National Bank at the corner of Buchanan and St. Vincent Streets (728) differs from the accepted one in the entrance being placed at the corner in a tower that terminates with a dome.

Domestic Work.

Of domestic architecture the largest local example is the house at Kelvinside (723), by Mr. H. E. Clifford. The style is English Renaissance, with open porch, stone terrace, and large flat oriels, all very solidly treated in stone. Something of the same treatment is seen in the house at Perth, by Messrs. Watson & Salmond (746); quiet and well proportioned, the large windows that give the whole character to the exterior are just of the kind that makes a room beautiful within. From the same hands is the steading (751) at Netherton. 704 and 755 are country houses by Mr. Macartney, both of brick. Frithwood House has projecting eaves in the form of a cornice; Welders runs up to a parapet and ogeed gables. 749 and 757 are views of "The Retreat," Lakenheath, by Mr. Andrew N. Prentice, a fairly large country house that has considerable variety of material in its construction, but none more noticeable than the thatching, shown worked into a kind of pattern. Photographs 731 and 732 are houses by Mr. Lutyens, known locally for his inn at Rosneath, of great interest. Perhaps the best example of the small brick house shown is that at Walton-on-Thames (741), by Messrs. Niven & Wigglesworth, whose ogeed gable and three oriels, alike and carried up two floors, show simple treatment and studied design in the symmetry employed and the proportions of best conventionality. Half-timbered work is almost absent from all the English examples shown.

Interiors and Old Work.

Of interiors, by far the most elaborate is the yacht "Margarita" (705), by Messrs. Watson & Mitchell. Photographs show a profusion of richest detail that would be oppressive anywhere else than in a ship where the nearness of every part to the eye-level and the concentration of attention given to every little detail in one's circumscribed home is sufficient justification.

Among the drawings of old work, the best is the Banqueting Hall of Craigievar Castle (699), by Mr. James Smith. 694 and 750 are good pencil-drawings of a font in Sienna Cathedral and a doorway in St. Mark's, by Mr. L. R. Guthrie. 729 is a decorated ceiling from Pistoja, by Mr. John Stewart. Mr. Pennell's pen drawings of Notre Dame of course stand in no need of praise.

The Exhibition stand (753), in Saracenic style, by Messrs. Honeyman & Keppie, is very bright and suitable in design. An interesting feature in the room is the presence of cases of jewellery by Mr. Gilbert, R.A., and silver objects by Mr. Gilbert Marks.

This sums up the Architectural Section. The average of merit is more than respectable, and there is no very poor drawing hung. All the same, the absence of worthy contributions from architects of note is conspicuous, and this may account for the leniency of hangers, who have accepted some works that hardly call for public exhibition.

A Foreign Competition.—The Florentines recently threw open to public competition the designing of the facade of St. Lorenzo. Like most of the Florentine churches, it has hitherto been without a facade. A large sum of money having been left for the purpose of completing the church, a circular was sent to all the art schools and well-known artists in the country. A thousand drawings were sent in, of which fifty-two were selected for further consideration by a committee of seventy-two competent judges. It seems that the design which has received the greatest amount of votes is the work of a hitherto unknown and very youthful artist.

THE CLASSIFICATION OF ROMANESQUE ARCHITECTURE.

BY FRANCIS BOND, M.A.

THE following is an abstract of a paper read before the Royal Institute of British Architects on April 22nd last by Mr. Francis Bond, M.A.

In introducing his subject Mr. Bond alluded to some of the difficulties which beset the student on his first introduction to the great style which preceded Gothic and was based on Roman work. This subject of the classification of the Romanesque styles was a large one, and could only be dealt with shortly within the limits of his paper. Classifications already existed—those of De Caumont, Quicherat, Viollet-le-Duc, and particularly Anthyme Saint-Paul, were referred to—but they helped one but little forward. It remained to consider whether a wider basis of classification could not be found—one resting on the main facts of plan and structure.

The Efforts of the Old Builders.

First of all, what was the one thing that the old builders—whatever the schools they belonged to—were trying to do? With the exception of a certain number of them who were attempting to solve the church-building problem by following the type of St. Stefano Rotondo at Rome or of St. Vitale at Ravenna, and whose furthest outposts, with the exception of the churches of the Knights Templars and the Knights Hospitallers, are to be found in the churches of Aix-la-Chapelle, Ottmarsheim, and Germigny-des-Prés, all the builders of Western Europe, from the ninth century, when Romanesque architecture commenced, to the twelfth century, when it was superseded by Gothic, were engrossed with one supreme problem—how to vault a basilica. This was the master problem of the builders of the Middle Ages from the end of the ninth to the middle of the twelfth century. The amount of engineering skill, the ingenuity, and the variety of the solutions proposed were astonishing. They seemed never to have had their full due. Gothic architecture got nearly all the credit. As a matter of fact, every single one of the main difficulties inherent in the task had been effectually met—and met in more than one way—before the first Gothic architect ever handled a trowel. Early in the twelfth century, or before, at least five complete solutions had been arrived at, as may be seen at Le Puy, Tournus, Cluny, Speyer, and Durham.

Vaulting Classified.

The problem how to vault a basilica meant —(1) that there were to be aisles as well as a high nave; (2) that some form of vault construction was to be devised; (3) that since a vault of stone was heavy, piers must be substituted for graceful, but weak, classical columns; (4) that the thrusts of the high vault of the nave must be stopped in some way by abutment in or above the aisles; (5) that top-lighting by clearstory windows was to be retained; (6) that the outer surface of the vault must be protected from the weather.

(i.) In most cases one or more of these conditions were evaded. One school—the most ancient of all, which held the whole of the field till the ninth century—simplified the problem by omitting the vault and retaining the colonnade.

(ii.) A second solution—also very incomplete —was to omit the aisles; to build a hall-church roofed with a tunnel vault. This simplified the question of supports, for it substituted solid walls for hollow arches, any amount of clearstory light could be introduced, and the walls could be thickened to any extent to provide continuous abutment to the thrust of the great tunnel vault. Everywhere it was the natural and proper solution where only a small church was required, but it was employed in Provence even in churches of cathedral rank.

(iii.) A third method, represented by the school of Périgueux, also removes the difficulties of supports, abutment and top-lighting by eliminating the aisles. It presents us with another variety of hall-church, roofed, not with a tunnel, but a row of domes, and it is to be noted that the corners of each square bay of the nave are filled in with pendentives to support the dome.

(iv.) The next method is found only in the church of Loches, near Tours. Originally there was a low tunnel-vaulted nave, without aisles, of the eleventh century. But about 1160 the eastern portions of the nave were pulled down, two square bays were formed, and on these bays two spires were erected.

(v.) In two churches of the first rank a row of domes was employed to roof an aisled nave. The nave was spanned by a series of strong arches. These were so placed as to divide the nave into square compartments. On each square an octagonal dome was poised, the corners of the square being filled up with corbelling or squinches to afford support all round to the base of the dome. The typical example of this is the wonderful cathedral of Le Puy, the nave of which is roofed by a row of six domes on squinches.

(vi.) The next method may be distinguished as the arch-and-lintel system. Strong transverse arches were built across the nave about 9ft. apart; a wall was built on each arch rising up to the apex of the arch, and then lintels of basalt were laid longitudinally—*i.e.*, from west to east. Count Vogüé has fully illustrated this curious phase of architectural history in "La Syrie Centrale."

(vii.) We next come to a whole series of attempts to solve the problem by covering an aisled nave with what is called a tunnel, wagon, barrel or cradle-vault. Of these the most scientific is that of Tournus Abbey church. As in the churches of Syria, the nave was spanned by stout arches, each arch carrying a wall. But each pair of these walls, instead of carrying lintels, as in Syria, carries a short tunnel set *transversly*.

(viii.) We now come to the vast number of churches in which the tunnel-vault of the nave was placed longitudinally—*i.e.*, in the direction of the axis of the church. The naves vaulted with longitudinal tunnels may be divided into those (*a*) where the tunnel rests on a pier-arcade; (*b*) where the tunnel rests on the arches of an upper vaulted aisle; (*c*) where the tunnel rests on a wall pierced with clearstory windows.

(ix.) Such interiors as that of Notre-Dame de Poitiers were painfully low. It would have been dangerous, however, to raise the tunnel much by increasing the height of the piers. So, in Auvergne especially, the expedient was hit upon of building two aisles instead of one, both vaulted; then the tunnel could spring at a much higher level. Moreover, some of the gloom of the Poitevin type of nave could be dispelled by piercing the back wall of the new upper aisle with windows.

(x.) The first step to carry out the one unfulfilled condition in the problem—the provision of clearstory light—was taken by piercing the base of the tunnel itself with clearstory windows. The final step—a most important change—was to insert the windows wholly in a clearstory wall. This latter seems to have been accomplished independently in the south, in Provence and Languedoc; in the north, in Burgundy. The clearstory was already in use in tunnel-vaulted churches in the eleventh century at Saint-Guilhelm-du-Désert, in the Southern Cevennes; and in Burgundy on a small scale at Saint-Benoît-sur-Loire (commenced 1062), and on a gigantic scale at Cluny (commenced 1089).

(xi.) This solution, which was destined, within a generation or two, to culminate in the Gothic architecture of Saint-Denis (1140), consists in covering a nave with unribbed groined vaults.

(xii.) The final step was to substitute the ribbed for the groined vault, to dispose the vaulting compartments of the nave in oblongs, to facilitate the vaulting of these oblongs by the application of the pointed arch, and to transmit the thrusts of the high vault by means of flying buttresses to the buttresses of the aisle walls. To this, Gothic architecture added three developments: (1) It weighted the buttresses with pinnacles; (2) to a large extent it replaced the masonry of the walls by glass; (3) in Durham nave, the Abbaye-aux-Dames, and elsewhere, abutment was sometimes provided by flying buttresses disposed beneath the aisle roof. In Gothic the flying buttresses are placed above the aisle roof.

(xiii.) This method, which consisted in omitting the vault, was no solution at all. The nave is not constructed in genuine basilical fashion, as in the first method, but is built as if a vault were intended. The home of this unworthy construction is Normandy.

A Criterion.

Of the foregoing solutions of the vaulting problem, the third, the employment of a dome resting on pendentives, is by itself a full and satisfactory criterion. It occurs nowhere except in a group of some thirty-five churches in the district of Périgueux, with such "outliers" as Fontevrault and Angoulême. No. 2, the hall-church, is most common in the south-west and south of France, from Poitou to Provence. It may be vaulted either with a longitudinal tunnel or with groined or ribbed vaults. No. 8, where a tunnel vault rests directly on the pier arches, occupies much the same districts as No. 2. No. 9, where the tunnel rests on the arches of an upper aisle, extends from Clermont-Ferrand, in Auvergne, to the south-west as far as Conques and Toulouse. No. 10A, where the tunnel is combined with a triforium and clearstory, is the final development reached in Burgundy. No. 10B, where there is tunnel and clearstory, but no triforium, is the solution of Provence and of Piedmont. No. 12, the ribbed vault, occurs sporadically, except in Germany and Lombardy, where it is characteristic. No. 13, the unvaulted nave, was nearly universal in Normandy and England till the twelfth century was well advanced.

The Planning Test.

The author went on to consider how these eight divisions will stand other tests. A very important test is afforded by the planning of a church, especially of its eastern limb. It must suffice to trace four main types of choir-plan. The first is that with three parallel eastern apses, of which there is a variant with square-ended aisles, as at Cerisy-la-Forêt, and another with aisles square externally and semicircular internally, as at Romsey. This is pre-eminently the plan where the unvaulted nave prevails, viz., Normandy. It is frequent in Lombardy and in those Provençal churches that have aisles. A second plan is that of the ambulatory and "chevot." It is rare in Germany, Lombardy, and Provence, and non-existent in Normandy (excluding England).

The plans alone, apart from other considerations, would entitle Germany to rank as a distinct architectural province. In Provence the aisled churches generally have three parallel eastern apses.

The Central Tower Test.

The divisions may be tested again by the treatment of the central tower: (1) its vaulting; (2) its shape, whether square or octagonal.

The Romanesque builders had three forms of vault at their disposal in the eleventh century; the groined vault, the tunnel vault, and the dome. The most difficult problem they had to cope with in vaulting was the question of putting a vault over the crossing, resting not on walls, but on four unbuttressed legs. They had hardly dared yet to put a groined vault over their naves, fearing its concentrated thrusts. Their favourite tunnel vault could not be used at all at the crossing, for it needed solid walls for its support. They had perforce to use the dome, in all cases, except in the Périgueux district, resting on squinches. Secondly, they had to stop the thrusts of this dome by carrying up a central tower to weight the arches or walling on which the dome rested. As regards the shape of this tower, they had two alternatives. The crossing was square, and so the tower over it might be square, as was the great central tower of Cluny and that of Tournus. But the squinches reduced the square of the crossing to an octagon; and as the tower rested directly on the octagon and not on the square, it was more natural that the tower also should be octagonal. Hence that magnificent series of octagonal central towers in Burgundy and Southern France, Germany, and Lombardy, culminating at Mayence and Saint-Sernin, Toulouse. In Normandy and England, on the other hand, the builders hardly ever dared to vault their naves at that early date, and never the crossing. And there being no dome in an Anglo-Norman tower, it is square.

Grouping of Towers.

Another test is afforded by the grouping of the towers. (1) The glorification of the tower reaches its highest pitch in Germany. Six towers are found at Speyer, Worms and Laach, seven at Limburg. (2) In Burgundy the magnificent tower group of Cluny seems to have remained without a rival. Its daughter churches were satisfied with a triplet; an octagonal central tower and two square western towers was the favourite arrangement. The towers have several stages, similar in form. (3) In Normandy also the triplet was the favourite, but the central tower was square, and not domed internally. (4) In Poitou the characteristic is the conical spire "en pomme de pin," which often surmounts the tower. (5) In the Périgordian region is seen the same conical spire, together with the characteristic cupolas. (6) In Provence "a simple square tower is common, with a very low spire." But some have central octagons. (7) In Auvergne a specially characteristic arrangement is that of a square western tower in the centre of the facade and a central octagon. (8) In Northern Italy the campanile type greatly predominates, and where the massive Romanesque tower is found, it is usually divided (in campanile fashion) into very numerous stages. Nowhere, except in the Como churches, does the campanile form part of the structure of the church; often it is quite detached.

Summary.

We may discriminate the following eight schools of Romanesque: I., the Périgordian; II., the Poitevin; III., the Provençal; IV., the Auvergne; V., the Burgundian; VI., the Norman; VII., the German; VIII., the Lombardic.

As regards the above classification, one word of caution is necessary. In speaking, *e.g.*, of the style or school of Auvergne, it is not meant that all the churches in Auvergne were built in this style, or that there were no such churches outside Auvergne, but merely that such churches were more common in Auvergne than elsewhere, and may therefore for convenience be described as belonging to the style or school of Auvergne. Also that those features described as characteristic were not invariably found; they were merely those which occurred most frequently.

One is tempted to try to work out the relations to one another of the different schools. Certain resemblances are patent. The superimposed aisles link the style of Lombardy to that of Auvergne; German Romanesque is connected with Lombardic on the one hand, and with Norman on the other. But a much more exhaustive classification is necessary before any results of lasting value are likely to be obtained.

Still stronger is the temptation to enquire into

The Origins of all the Romanesque Styles,

whether they are derivatives, as some have held, from Provence or, as others have held, from Lombardy. Such architectural pedigrees are not, as a rule, trustworthy. And there always remains an alternative hypothesis, which seems to have within it much of truth, namely, that the styles were none of them mainly derivative, but that the same problem was engaging all the different regions more or less simultaneously; that the builders of each region were solving it, with some little light, indeed from their neighbours, but mainly independently, by empirical experiments of their own, aided by the survival here and there of traditions of Roman construction, and by the study of local Roman monuments.

Another caution requisite is that the classification does not cover the whole ground. This is necessarily so. Between each region and the next there was always a debatable ground, where two or more styles would be in simultaneous use. Indeed, a "pure" region would be the exception; the greater part of the area of any one country would employ mixtures of style. England is an instance.

It had always been customary, the author believed, to regard the Romanesque of England and Normandy as one. The Romanesque of Normandy, however, seemed to be a "pure" style, and that of England a "mixed" style. While by far the most important factor is the influence of such pre-Conquest churches as Bernay, Jumièges, and the Abbaye-aux-Hommes, we must also attribute some degree of importance, at any rate in the planning, to the highly developed Romanesque of Auvergne and Burgundy.

New Patents.

The following patents are open to opposition until June 3rd.

1900. — **Quick-setting Cements.** — 5,659. W. Wright, 48, Chesterton Road, North Kensington, W. Carbonate of potash or other suitable alkali is added to the water used in mixing the cement, making the latter set much more quickly. The proportion recommended is 1¼ oz. of the potash to one gallon of water.

Plaster Slabs.—6,338. E. v. Hedemann and R. v. Hedemann, both of Mariendalsoej 23, Copenhagen. Upright cruciform moulds are arranged on a carriage, and the moulding takes place on the site. Corner slabs can be moulded with one, two, or four corners, and by inserting loose end-pieces slabs of any proportion can be made. The slabs are smooth on both sides, and it is claimed that the work can be done quickly by inexperienced workmen. There is also the saving of the carriage on slabs between factory and building sites.

Surveying Instruments—6,819. M. Baumer, 7 & 8 Fenerweg, Nuremberg, Bavaria. The object of this invention is to enable surveying and plotting to be done without calculation. The instrument consists of a distance-meter, a system of rules, and a marking-point for determining the projection of the point sought and for reading off the catheti, and of a specially constructed theodolite. From the hypotenuse read off the corresponding catheti of even an inaccessible point can be directly obtained, and thus the co-ordinates also. Moreover, the result is transferred to paper on the spot and without the size of the projection being taken into account.

Sewage Tanks.—8,224. T. I. Goldie, Highbury House, Theatre Street, Norwich. Combined with one or two series of bacterial tanks is a single inspection chamber common to all. Another part of the invention relates to the syphonic discharge of sewage from one tank to another.

Conduits.—9,654. J. Hamblet, Piercy bluebrick, tile and pipe works, West Bromwich, and I. Parkes, 25, Bromford Lane, West Bromwich. Instead of moulding the sockets to receive electric cables separately and sticking them on to the body of the conduit, the socket is moulded in one piece with the conduit; this by the use of special dies.

The following specifications were published on Saturday last, and are open to opposition until June 11th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—194, Lancaster, apparatus for purifying acetylene gas. 5,843, Wright, bricks for building and decorative purposes. 6,295, Aldous & Aldous, ventilators. 7,824, Stanley & Smith, apparatus for forming the socketted ends of drain pipes. 8,094, Bickle, catch for doors and cupboards. 8,177, Gauntlett, Venetian blind. 8,484, Golby (*Woas*), flooring. 9,347, Pogson & Johnson, locks for windows, fanlights, &c. 9,361, Hilscher, levelling staffs. 10,218, Coiffier, Viéville & Majesté, manufacture of bricks, tiles, pipes, &c. 10 254, Crellin, lifting jacks. 13,750, Johnson (*Furness*), tiles for floors and other surfaces. 16,241, Clements, door-checking and holding apparatus. 22,540, Hight, street-sweeping machines. 22,596, Meurer, process for colouring glass yellow, red, brown, and black. 23,841, von Bischoff, draining apparatus for condensation water.

1901.—458, Davis, opal-glass facing tiles or plates. 667, Kling, buffers for street cars. 3,039, Calleson, drawing presses. 3,583, Mack, gypsum, cement, and similar slabs. 4,226, Harrass, manufacture of veneer structures. 4,307, Jamison & Martin, bolt fastening and tool for setting it. 4,502, Rowsell, taps, cocks and valves.

Sixty Workmen's Houses at Southend are to be erected by the Town Council at a cost of £16,250, including the purchase of land.

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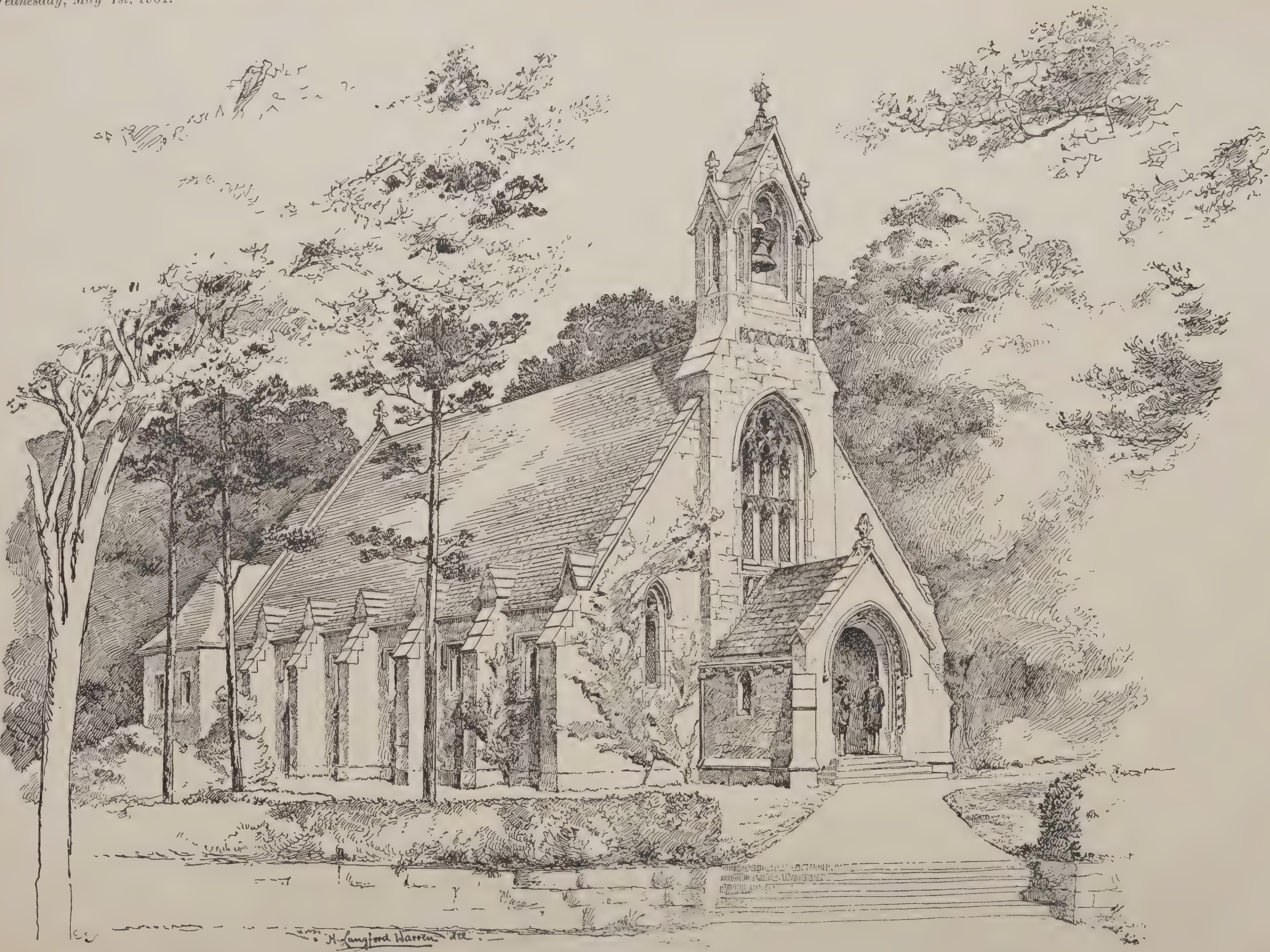
***Wednesday**, May* 1*st*, 1901.


H. Langford Warren del.

CHAPEL FOR THE NEW CHURCH THEOLOGICAL SCHOOL, CAMBRIDGE, MASS. WARREN, SMITH AND BISCOE, Architects.

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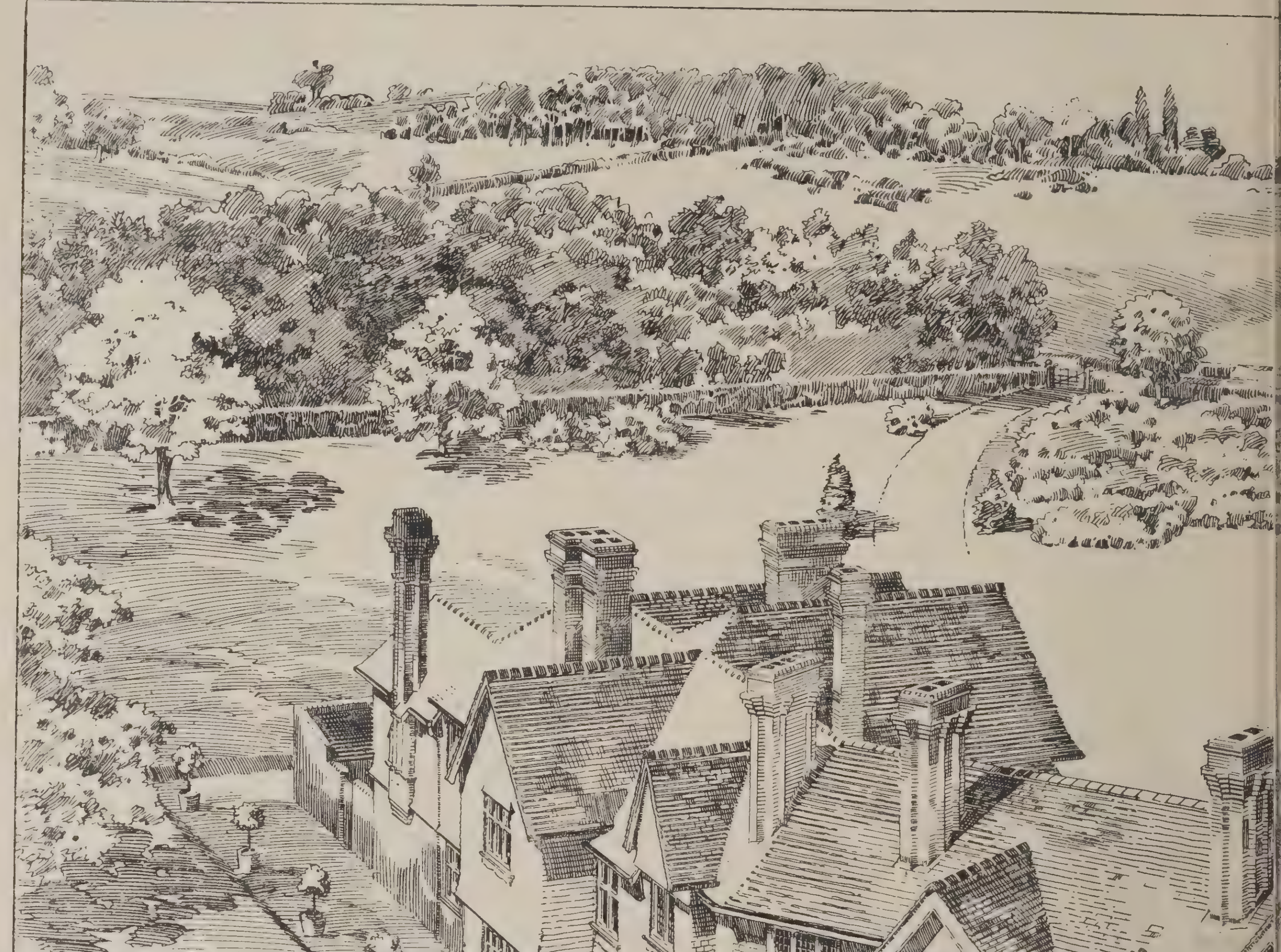
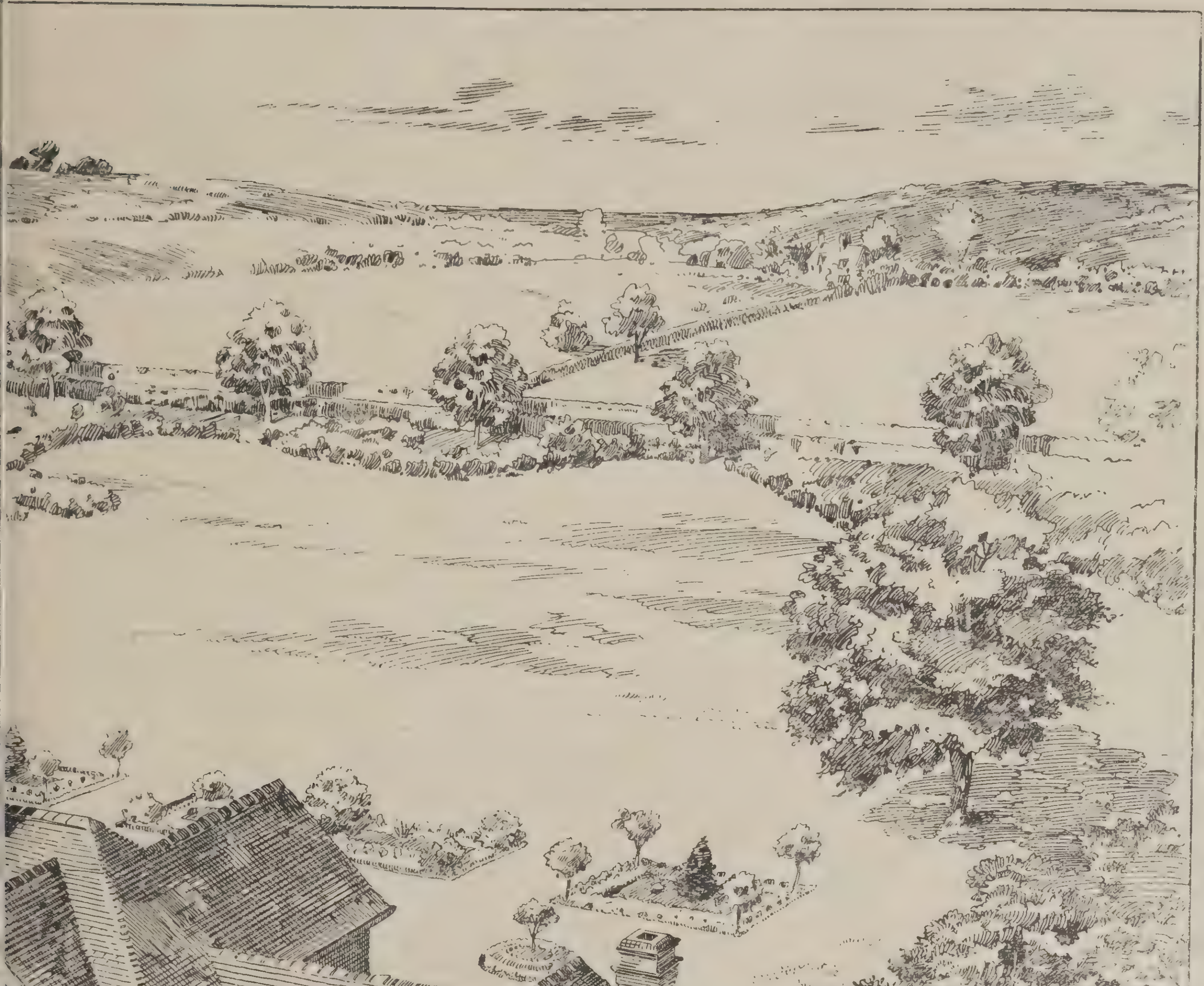


C. Harrison Townsend,



I.B.A., Architect.

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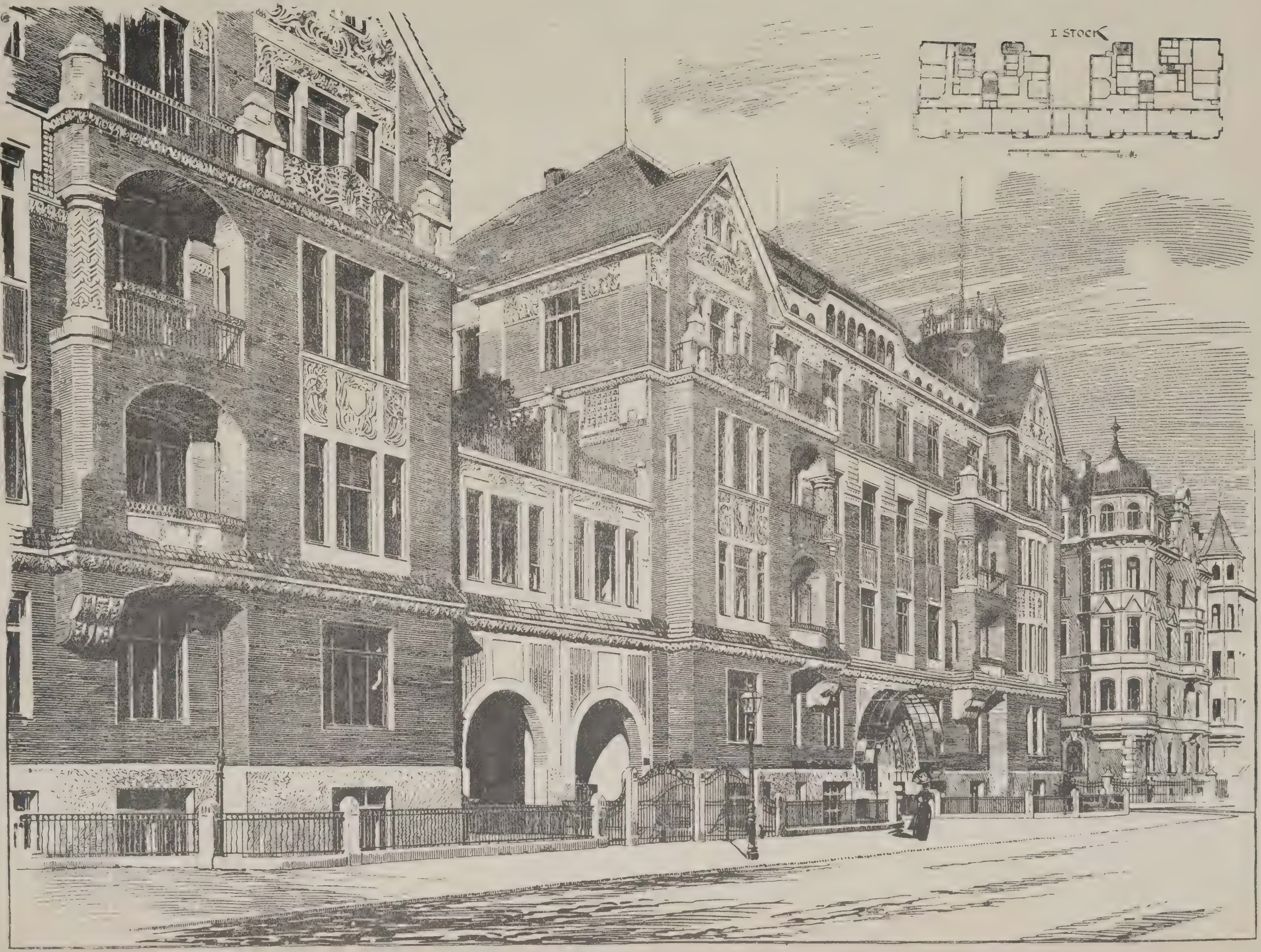

MANSIONS, FRIEDRICHSTRASSE, MUNICH. Martin Dülfer, Architect.

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Bricks and Mortar.

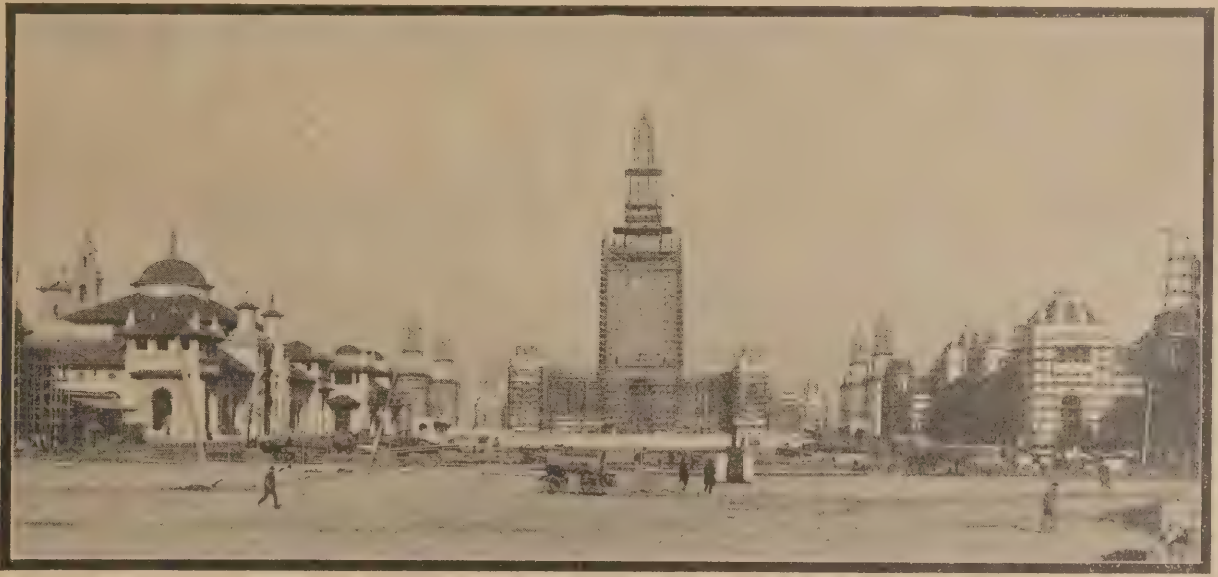
APHORISM FOR THE WEEK.

A taste for sculpture belongs to the best, purest and noblest of our enjoyments; and we feel most reluctant to be separated from those forms from which, however often we contemplate them, we derive renewed and indeed heightened pleasure.—HUMBOLDT.

Our Plates. "DICKHURST," near Haslemere, Surrey, by Mr. C. Harrison Townsend, F.R.I.B.A., is now in course of erection. Red brick and genuine half-timber work with plaster are being used for the elevations, the roofs covered with red tiles, and the casements filled with leaded lights; the roof on the south front is covered with red tiles taken from an old building in the neighbourhood. The house is built angular in order to obtain a good view over a stretch of beautiful country. There is a wide corridor on the north front with the staircase opening out of it, and a large hall, oak-panelled and having an open timber roof, is provided. Facing this hall is an ornamental garden with hedges of yew and a sundial in the centre, the whole having an old-world aspect.

Stained Glass in New College, Oxford. A WORK of great interest, upon which Messrs. James Powell & Sons, of Whitefriars, have been engaged during several years for the society of New College, Oxford, has now been completed, in the cleaning and protection against future damage of the windows of the ante-chapel. It is not, in the usual sense of the word, a restoration, the beautiful fourteenth-century glass, which is beyond all reasonable doubt of English workmanship, having been replaced without addition or omission; but the result has been to restore nearly to its original brilliancy what had been obscured by dirt, and was in peril from its own frailty and the decay of the leadwork containing it. The ante-chapel, which is very spacious contains—besides the great west window, filled in 1784 with glass stained and afterwards painted (by Jervois) from designs prepared for the college by Sir Joshua Reynolds—seven windows, viz., two in the west wall (one on either side of the great window), two in the north wall, one in the south, and two in the east (one on either side of the choir). In the case of the two windows in the east wall, here, as was pointed out by Mr. Winston, in a paper read before the Archæological Institute at its meeting held in Oxford in 1852, the lights are narrower than those of the other windows in the ante-chapel or choir, and are six in number in each row instead of four. At some unknown date these lights had been re-arranged, and some, which had been mutilated, were filled in with glass of the same date and character taken from other windows, either those of the choir or (as seems to be indicated by signatures of the glaziers with dates 1775 and 1777, which Messrs. Powell discovered on fragments of the old glass) the great west window. Thus, in the northernmost of these two windows six apostles stood in the lower row, and in the southernmost one the order of the lights of the lower row had been confused. Messrs. Powell, following the general plan of re-arrangement proposed by Mr. Winston, have replaced the apostles in the upper tier of the more northerly window, but have somewhat varied his order below, restoring, however, the undoubtedly original arrangement of four Crucifixion groups. As, with the exception of some details in the tracery of the choir windows, no other specimen of the glass of William of Wykeham remains in either of his colleges, nor yet in Winchester Cathedral, the completion of this beautiful work is matter of great satisfaction. As the glass of the great west window was fast becoming fainter in colour, owing to chemical and mechanical waste, this relic of the eighteenth century taste has been framed between two layers of white glass, and will, it is hoped, be preserved for very many years.

The Pan-American Exposition. THE illustration on this page shows on the left the Machinery and Transportation building (Mr. Edward P. Green, architect), in the centre the Electric Tower (by Mr. John G. Howard, of New York), and on the right the Manufactures and Liberal Arts building (Mr. George F. Shepley, architect). An article on this exhibition was published in our issue for January 9th last.



GENERAL VIEW OF THE PAN-AMERICAN EXPOSITION AT BUFFALO, N.Y., FROM THE ESPLANADE.

Rag Fair. THE last remains of "Rag Fair" are situated in the thoroughfare known as Royal Mint Street. In the year 1756, or thereabouts, "Rag Fair" was in the zenith of its fame as a market for old and second-hand clothes, vieing in popularity with the later market of Petticoat Lane, and its western compeers in Holywell and Wych Streets Strand, W.C. They are now at last to come down, nearly all the property having been scheduled for the Tower Bridge improvement. The buildings in the street are ancient and date from the seventeenth century to about 100 years later. The interiors are exceedingly cramped. The rooms are reached by the narrowest of winding staircases, and their cubical dimensions would not receive the approval of present-day local authorities. When the Royal Mint was removed from the Tower early in the last century to the site immediately adjoining the back of these premises, a high brick wall was erected to separate them from the Mint grounds. There is evidence that a subterranean passage leading from these houses towards the river was at one time in existence. Royal Mint Street runs out of the Minories, a district which was at one time inhabited by gunsmiths and armourers. Like several other districts of the City, the Minories received its name from ecclesiastical associations. An abbey of nuns of the Order of St. Clare, called the Minories, was founded in 1293 by Edmond, Earl of Lancaster, Leicester, and Derby, a brother of Edward III. The abbey surrendered to Henry VIII. in 1539. The Minories was listed amongst the fashionable quarters of the City at one time, but not for long.

Portman Market. PORTMAN MARKET, which has been rebuilt upon the site of the old market in Church Street, Marylebone, is open for business purposes to-day. The market, which exists by virtue of two Acts of Parliament passed in 1830 and 1832, and is held by its present possessors under a lease from Lord Portman, stands in Church Street, Edgware Road, close to the goods depôt of the Great Central Railway, and the Great Western and other trunk lines. Those interested in the market point to the advantages of this situation for obtaining supplies of produce of all kinds, especially emphasising the facilities it affords for fish traffic from Great Grimsby and Hull by the Great Central line. It is claimed also that the market will be of great benefit to tradesmen in Paddington, Marylebone, Kilburn and other districts of north-west London, inasmuch as they will be saved the necessity of travelling four or five miles to the Borough markets. Billingsgate and Spitalfields, and three or four miles to Smithfield and Covent Garden, in order to purchase their supplies. The market, the site of which is rectangular in form, covers an area of 43,426 sq. ft., and new buildings of iron and steel have been erected at a cost of £40,000. These consist of eight avenues, radiating from a central point, where there is a lofty dome, together with a west, a north and an east avenue. The number of stalls is about 180, and in addition there are some shops on the street frontages. No tolls are to be levied on the goods that enter the market, the Portman Market Company relying for their profits on the rents paid by their tenants, who are supplied with electric light at the fixed charge of three-halfpence per lamp per day. Below the ground level of the market a large space has been excavated to provide cold storage for the convenience of those engaged in the frozen meat trade, which has developed enormously in London of recent years.

Excavations at Thermos, in the province of Ætolia, Greece, conducted by the Archæological Society under the direction of M. Sotirades, have resulted in the discovery of important inscriptions of the third century and portions of bronze statues. In the neighbouring valley some remarkable monuments have been disclosed, of solid construction and fine workmanship, together with a quantity of small figures in terra cotta, in a ditch which probably formed part of a temple. On the bank terra cotta inscriptions have been found in the characters used by the ancient Corinthians.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication

Work for Plasterers in Australia.

GREENOCK.—A. T. T. writes: "What city or town in Australia would be best for a plasterer to go to? What is its temperature? Kindly also give the name and address of the leading master-plasterer in the best district, the wages, what moderate living would cost, and any other advice."

Modesty does not characterise the above query. The best we can do is to refer "A. T. T." to the Emigrants' Information Office, Broadway, Westminster, S.W.

Builders' Book-keeping.

FROME.—H. C. writes: "There is, I believe, a book on book-keeping for builders, but I cannot ascertain the name of the publishers. Can you kindly supply the information?"

"Builders' Book-keeping: A Perfected System," by Mr. Sidney Saker, is published at 95–97, Finsbury Pavement, E.C. Its price is 3s.

"From Paddington to Penzance."

LONDON, N.—SHERBORNE writes: "Kindly give the title of Mr. C. G. Harper's book on places of interest in the West of England. I believe the journey was taken from London to Penzance, but I do not know the name of the publisher."

"From Paddington to Penzance," by Charles G. Harper, was published by Messrs. Chapman & Hall, Ltd.

Book on Incline Plane Machinery.

SPAIN.—G. A. B. writes: "Kindly mention the name and publisher of the latest treatise on the setting-out and construction of incline planes and incline plane machinery."

We have made enquiries, but cannot obtain particulars of any such work. Our contemporary "The Quarry" (49, Essex Street, Strand, W.C.) might be able to give some information on the subject.

Sketching at Wells, Somerset.

BIRMINGHAM.—SKETCH-BOOK writes: "I propose going for a fortnight's sketching and measuring tour to Wells, Somerset, and I should be glad if you could supply me with a few particulars of the district and special architectural places besides the Cathedral."

An illustration and some particulars of Wells Cathedral were published in our issue for August 23rd, 1899; but plenty of information about Wells will be found in the numerous architectural text-books. Besides the Cathedral, there is the Bishop's Palace, originally built in the form of a quadrangle by Bishop Joceline (1205–1244), and surrounded by a lofty circuit wall, and there are the cloisters. St. Cuthbert's Church is one of the finest of the many fine parochial churches in Somersetshire. Anyone visiting Wells would, of course, visit Glastonbury. In their "Cathedral Series" Messrs. George Bell & Sons, of York Street, Covent Garden, have published a book on Wells (price 1s. 6d.).

Slope of Roofs and Strength of Iron.

PENARTH.—H. writes: "Kindly answer the following questions, which were asked in the Intermediate R.I.B.A. examination: (1) The minimum slope for tiles and slates. (2) What is the difference in strength between wrought iron and cast iron? (3) Why are water pipes made stouter than waste pipes? (4) What is the proper slope for lead roofs?"

(1) Pan tiles are best laid to a slope of 24 deg.: plain tiles can be laid to any slope from 25 deg. to 60 deg. Slate roofs are often seen laid to a slope of 15 deg., but 30 deg. should be the least, and we would advise 45 deg. If the hips are to be mitred the angle should not be less than 45 deg., or very large slates must be used at the hip, and these look unsightly; on no account should small pieces be allowed. (2) The safe loads per sq. in. usually adopted are: for cast iron, tension $1\frac{1}{2}$ tons, compression 8 tons; for wrought iron, tension 5 tons, compression 4 tons; for steel, tension 6 tons to 8 tons, compression, 6 tons to 8 tons. (3) Because water pipes have to resist considerable pressure, due to head of water, whereas waste pipes have to resist practically none. (4) Gutters and flats should be laid to a fall of at least one inch in 10ft.

Standard Size for Eye-Bar.

CROYDON.—ROOFS writes: "Is there any *standard* table for the dimensions between arrows in the accompanying sketch of eye-bar heads. Carnegie gives a table of dimensions from 3in. diameter and upwards, but we require $\frac{1}{2}$in., $\frac{3}{4}$in., and so on up to 2in."

This question has been frequently discussed, and the standard shape varies according to the purpose for which it is required. For crane stays the rule is to make the eye round, the pin equal to the diameter of the rod, and the combined sectional area through the sides of the eye from $1\frac{1}{4}$ to $1\frac{1}{2}$ times the sectional area of rod, a stress of 3 tons per sq. in. under full load being allowed, giving the proportion shown in Fig. 1. When broad thin bars have to be connected by pins it is necessary to weld bosses on the sides, as in Fig. 2, in order to obtain sufficient bearing area on the pin and tensile strength in the sides of the eye. For the chains of suspension bridges, where the eye is formed by making a hole in a bar, the form shown in Fig. 3 is preferred, as it gives more resistance to bursting by the pin splitting through the grain of the material. For steel tie-bars in roofs, the Shaler-Smith type is considered best, as shown in Fig. 4. Figs. 2, 3 and 4 are for flat bars For round bars in roofs the proportions may be as in Fig. 5, the common octagonal portion being omitted as useless. HENRY ADAMS.

Books on Timber.

LITTLEHAMPTON.—RENUAD D'EST writes: "What books are there dealing with the formation and growth of all the different woods, their peculiarities when worked, their specific gravity and density, and the method of cutting out baulk timber to advantage, &c.? Please also name a good book on elementary building construction."

"Timber and Timber Trees: Native and Foreign," by Thomas Laslett (price 7s.), will furnish the desired information. "Tredgold's Carpentry," revised by Hurst (price 10s.), also deals considerably with timber. Rivington's "Notes on Building Construction" are the best books: Vols. I. and II. cost 16s.; Vol. III. 16s.; and Vol. IV. 11s. 6d. Cheaper, but useful, works are Mitchell's "Building Construction"—elementary stage, 2s. 6d.; advanced, 4s. 6d. They can all be obtained from Mr. B. T. Batsford, of 94, High Holborn. W. E. C.

Cost of Building.

LONDON, N.W.—QUESTION writes: "What would be the approximate price per ft. cube of a workman's cottage (detached) containing four rooms and a small scullery, of half-timber construction, the cells, posts and heads being of pitch-pine, left rough from the saw and oiled, built on a dwarf brick wall (1ft. 6in. showing above ground) and the roof tiled? It is genuine half-timber construction, not filled in with bricks. Also, the price per ft. cube of a stone clock tower, perfectly plain, on a small platform with a few steps up. Also the price of a clock for a tower, having three dials 6ft. in diameter, striking hours only."

The cost of such a workman's cottage would depend largely upon the cost of labour in the neighbourhood, and whether built under a competitive contract or simply to order. If all on one floor the roof will be costly in proportion to the cubic contents covered. Probably the cost would be about 8d. or 9d. per ft. cube, taking the greatest horizontal height multiplied by the height from top of footings to half-way up slope of roof. A plain clock tower as described might, perhaps, be put up for 5s. per ft. cube. A good 3ft. turret clock single face might be fixed for £25. A clock with three dials of 6ft. diameter, striking hours, would be about double the cost, or say £50. HENRY ADAMS.

Improving Damp Gardens.

NEWCASTLE-ON-TYNE.—B. P. writes: "Kindly recommend some treatment in cement, &c., for a small garden which is very damp and will not grow grass. Could Yorkshire stone slabs be used cheaply with success?"

First lay 2in. pipes not less than 15in. below the surface, about 20ft. apart, to an outfall,

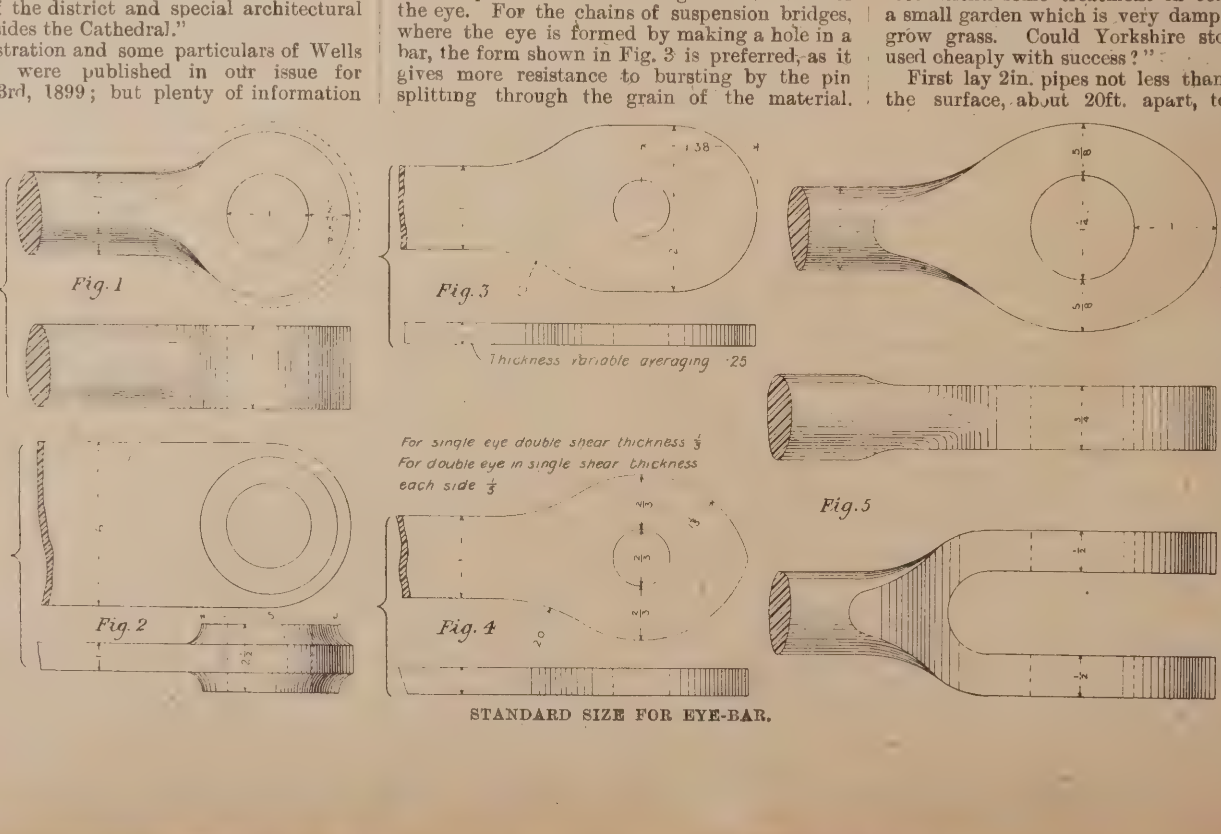


Fig. 1
Fig. 3
·138
Thickness variable averaging ·25
Fig. 2
For single eye double shear thickness ⅜
For double eye in single shear thickness each side ⅓
Fig. 4
Fig. 5

STANDARD SIZE FOR EYE-BAR.

Spread on these cinders or ballast. Lay a coating of cinders or burnt ballast 4½in. deep, and on this put either a layer of tar pavement (costing about 2s. 3d. per sq. yd.) or Yorkshire slabs or cement, each 2in. thick. If the site can be drained, a design for beds could be left in one or two places for plants. No size is given. A. E. M.

Charges in Respect of Deceased Architect's Practice.

YORK.—ANXIOUS writes: "Some time ago I succeeded to the practice of a deceased architect. Several works were uncompleted. I have an agreement with his executors by which they agree to pay me the usual professional charges for any work I may do for them. In one case the bills of quantities, specification, and other memoranda connected with a contract amounting to £4,000 had in ignorance been destroyed before I took over the practice. The deviation and alterations from the original intention were so great that I found it necessary to measure up the whole of the contract work as well as extra works amounting to nearly £2,000. The various accounts have been paid by the proprietors and everything settled up. What would be a fair charge for me to make on the executors for doing this work, which took nearly five months to complete?"

If, as querist states, "the work took nearly five months to complete," we are afraid there is no "usual professional charge" that would make the work remunerative. It is clear that "Anxious" is entitled to charge upon the basis of the charge for the original quantities, as he has done the work over again. A maximum charge in that case would be 2½ per cent., but should be subject to a deduction if less than this was agreed to be charged originally, *e.g.*, presuming the deceased partner charged 2 per cent., then 2 per cent. would be a proper charge for the re-measurement and adjustment of the final account. W. E. D.

Oak.

ST. PETER'S, THANET.—J. N. writes: "What is a good sort of oak to specify for joinery—doors, panelling, mantelpieces, &c.? What of Dantzig or Riga? Is there any difference between them in cost, appearance, &c.? Are they less expensive than 'wainscot'? Do they stand well? If one specifies 'wainscot,' should he get English oak or merely foreign oak selected for figure?"

Dantzig or Riga oaks are not good, nor are they suitable for joinery as compared with American wainscot or Austrian oak. They do not stand well. These woods are less expensive than "wainscot," which if so specified is usually considered to be American. English oak is not suitable for wainscot; although it is of excellent figure it is not kind to work, and not only does it invariably warp, but splits and cracks.

Elementary Questions in Building Construction.

HASLINGDEN.—BUILDER writes asking us to answer an elementary question set in the Advanced Building Examination of 1899.

These columns are not intended for answering such questions. If "Builder" will refer to "Rivington's Notes on Building Construction," or Mitchell's "Building Construction," he will find all the information he needs.

Copper Nails for Tiling.

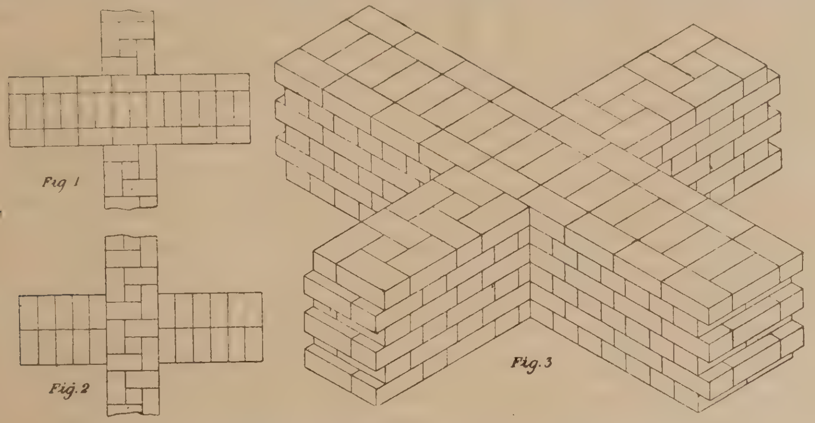
WOKINGHAM.—J. H. writes: "How many lbs. of 2in. copper nails are there to a square of tiling, laid to a 4in. gauge, and also to a 3in.? Do cast-iron pins rust and split the corners of the tiles?"

About 1¼lb. of copper nails are required for one square of ordinary tiling to a 4in. gauge, and about 1½lb. to a 3in. gauge; but, as the size so much affects the weight, we would advise "J. H." to count the number of nails in a square, and weigh an equal quantity himself; a square to a 4in. gauge generally requires 1½ hundred nails. Cast-iron pins rust, and are therefore not used; copper nails are expensive, and afford no advantage over composition, which we should advise to be used.

Bonding Junction of Cross Walls.

CLAPTON.—R. N. E. writes: "I should be glad if you would kindly answer this question: Based upon the accompanying plan draw to a scale of one-tenth full size an isometric projection, showing the plan of one course, elevations A B C D, and finished toothings at E and F."

Figs. 1 and 2 show small scale plans of the bonding in alternate courses, and Fig. 3 shows the isometric projection in the desired position.



BONDING JUNCTION OF CROSS WALLS.

It should be noted that since the advent of "polytechnics" and technical or trade classes the standard of accuracy has received a new interpretation in many subjects, and common angular projection such as this is known as isometric, while it is merely an imitation. It is a convenient substitute, and that is all. To use this method of projection, horizontal lines are measured along an angle of 30 degs. on either side, and vertical lines remain vertical, any scale being used as in an ordinary drawing. In true isometrical drawing the lines are foreshortened and reduced in the proportion of 1 to $\frac{2}{\sqrt{6}}$, or about 11 to 9. A cube would be so placed that the edges meeting at the nearest solid angle would be 120 degs. apart, something like a capital Y. HENRY ADAMS.

Openings for Architects in Egypt and the Colonies.

BRADFORD.—J. S. C. writes: "Is there any opening in the Government service for young architects and surveyors in Egypt or the Colonies? What are the qualifications necessary, terms of service, rates of pay, and status of such positions?"

Apply to the Agents-General for Canada, Victoria, New South Wales, Queensland, and Western Australia, all of whom have their offices in Victoria Street, Westminster, S.W., and to the Secretary of State for India, Whitehall, S.W., and the Secretary to Agent and Consul General for Egypt, Viscount Cromer, Cairo.

Formations inside Stones.

SHEFFIELD—J. J. writes: "A foreman of a stone-yard recently gave me a piece of stone (similar to sandstone and one of three) measuring 3in. by 2¾in., and almost spherical, which came out of a block of blue-stone. How did the stones get there?"

Our correspondent should have stated the kind of blue-stone. The spherical bodies referred to are generally deposited in the formation of a sedimentary rock, and assuming that the "blue-stone" referred to was of the usual kind the bodies were probably of concretionary formation. The concretionary structure is particularly observable in clays, limestones and ironstones. A concretion was formed by aggregating round some centre, such as a fragment of a plant or an animal. Clay-iron stone and impure limestone aggregated into spherical or elliptical forms (septaria) are of frequent occurrence in clay or shale. But many concretions may be found where no organic starting point can be detected, and are due to the irregular concreting of clay, sandstone, or limestone, owing to the spread of carbonate of lime through it, carried down by permeating water.

Books to Study for Civil Service Surveyorship.

FARNBOROUGH.—B. J. W. writes: "I have just entered a surveyor's office, and wish ultimately to enter the Civil Service as an assistant. What would be the best text-books to use for a course of reading in the following subjects: Drawing and theory of construction in architectural and engineering works, surveying, quantities, prices and estimates, use and properties of materials, plane trigonometry?"

E. W. Fritchley's "Art of Tracing" (published by the Education Society, Bombay); G. W. Tuxford Hallatt's "Hints on Architectural Draughtsmanship" (price 1s. 6d.); Rivington's "Notes on Building Construction" (Vols. I. and II., price 8s. each, Vol. III., 16s., and Vol. IV. 11s. 6d.); Mitchell's "Building Construction" (Elementary Stage, 2s. 6d., Advanced Stage, 4s. 6d.); Leaning's "Quantity Surveying" (price 12s.); Stephenson's "Estimating" (price 5s. 6d.); Snowball's "Plane and Spherical Trigonometry" (7s. 6d.); Angel's "Geometry" (Elementary, 1s. 6d., and Advanced, 8s.). These can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Drawing Perspective.

SOUTHPORT.—ACORN writes: "I wish to draw a perspective block of buildings on the enclosed plan (not reproduced). Where do the vanishing points come, and from where do I take my heights?"

Consult Mr. G. A. T. Middleton's book on "Linear Perspective" (price 1s.), published by Mr. B. T. Batsford, of 94, High Holborn, W.C.

Books on Granites.

LONDON, E.C.—W. J. T. writes: "What is the best and latest book dealing with granites."

We know of no book on granites alone, but you will probably find all you require in Geikie's "Text-book of Geology" (price 28s.), and Hull's "Treatise on Ornamental and Building Stones of Great Britain and Foreign Countries" (price 12s.). These books are published by Messrs. Macmillan & Co., Ltd.

Tests for Cement.

CROYDON.—R. E. L. writes: "Which of the following is correct: (1) 'Rivington's Notes on Building Construction,' Part iii., page 180 (3): 'A rough method of ascertaining whether the cement is cool enough for use, is by plunging the bare arm into the cement. If it feels hot the cement has not been sufficiently weathered, and requires further turning over.' (2) Mitchell's 'Building Construction,' advanced and honours courses, page 10, (f.) practical test: 'Bricklayers plunge their hands in the sacks of cement. If cold, it is dead and useless; if hot, it has not been sufficiently exposed to the air; if at blood heat, it is fit for use'."

Both paragraphs are correct as far as they go, but the test is a very rough one, as weather and the sensitiveness of the person will affect it, and again cements differ widely. The best rough test is to cast a small plate on a piece of glass and leave over night; if the cement is hot the surface will have cracked, and if perished will be very crumbly. As this test is easily made we see no advantage in the other, which is inconclusive.

SKETCH OF GABLE AT GHENT

BY E. STANLEY MITTOR.

TWO SKETCHES IN BELGIUM.

THE entrance to the Tribunal or Court of Justice at Malines, illustrated on the next page, is somewhat modern, being erected by Keldermans about 1617, along with the French artist Guyot de Beaugrant, and is the earliest example of the Renaissance in Belgium. The buildings have been skilfully restored by Blomme of Antwerp. The inside contains some fine chimney pieces and other interesting works of art. The old portions were erected by Rombaut Keldermans of Malines, in the late Gothic style; it consists of several picturesque buildings, enclosing several courts, and was formerly the palace of Margaret of Austria. The shop at Ghent or (Gand) illustrated on this page is a good example of the many fine buildings that Belgium can boast. It was erected in 1800. A special feature is the beautiful wrought-iron sign over the entrance, one of the best pieces of ironwork in Gand. The building is in stone, with iron casements and lead lights. The drawings are by Mr. E. Stanley Mitton.

Surveying and Sanitary Notes.

Portobello Promenade, Edinburgh, is to be extended westward at a probable cost of about £7,500.

A New Park at Ealing is to be opened to day. The Walpole Park, which is about 30 acres in extent, has been acquired by the Ealing District Council from Sir Spencer Walpole for the sum of £40,000. It was formerly for many years the residence of the late Right Hon. Sir S. H. Walpole, who died there in 1898. The park is well wooded, and it is intended as far as possible to retain it in its present form.

Masters and Men.

The Harrogate Plasterers, who went out on strike about a fortnight ago, have now resumed working on the masters' terms of $9\frac{1}{2}$d. an hour, and the arrangement will hold good for a couple of years. The men have also decided to work practically to the Leeds and Bradford rules.

Another Dispute at Leicester has occurred in the building trade; about sixty bricklayers and builders' labourers have ceased work at the new Wholesale Market in Halford Street, in consequence of a dispute as to the introduction of navvies to mix concrete. The builders' labourers, who receive $6\frac{1}{2}$d. per hour, claim that the work in question is work of a character which, under Sir William Markby's award, should be done by them and not by navvies, who are, it is alleged, paid at a less rate per hour. The Employers' Federation contend that things should be continued now as they were, pending arbitration, but the bricklayers' labourers demand that these navvies should be discharged before arbitration is entered upon.

The Amalgamated Society of Carpenters and Joiners, we learn from its forty-first annual report, has had an active year, and has expended in benefits to its members a larger sum than in previous years. The chief increase has been in dispute benefit, or, as such payments are termed, "trade privileges." Under this head the sum paid is £30,661, or £10,360 more than in any two previous years of the society's operations. This has been mainly caused by the prolonged strike on the part of the Belfast members for improved conditions. The matter seemed hopeless of settlement, as it had lasted nearly a year when it was recently referred to arbitration. Other considerable items of expenditure are unemployed benefit, £30,227; sick, £35,647; superannuation, £18,605. Despite this large expenditure the society has been able to pay its way without drawing upon its reserve fund of £204,089, and has, indeed, added to that fund a sum of £3,358. The total number of members at the close of the year was 65,012, an increase of 3,231 on the year. Of these 1,168 are in the United States.

The Chester Painters' Dispute.—At the end of last February some of the working painters of Chester came out on strike because their employers refused to sign a new code of rules. Fortunately both parties agreed to accept the friendly intervention of an arbitrator, the men returned to work immediately, and subsequently the mayor (Alderman H. T. Brown) at the request of both parties accepted the office of arbitrator. The points in dispute did not affect the rate of wages paid in the town, but chiefly the conditions of the men's employment in the country. Formerly the men were allowed 8d. a night lodging money up to four days, and the new rule they submitted asked for a shilling. On this point the arbitrator has given his decision in favour of the men, who will in future receive 1s. a night up to four nights. With regard to the distance which should entitle a man to return to town at the week end, the men's rule proposed that a workman employed on country jobs, over three miles and up to twenty miles, should be paid his third-class railway fare in and out every week, and over twenty miles up to thirty miles once a fortnight. In this instance the mayor made a slight alteration in the proposed rule bearing on the subject, its amended form being as follows: "Clause 2. All workmen employed on country jobs over three miles and up to fifteen miles to be paid third-class railway fare in and out every week; over fifteen miles and up to thirty miles distant, once a fortnight; over thirty miles and up to fifty miles, once a month; over fifty miles to remain on the job until completion."

New Wesleyan Church Buildings at Newland have been opened. These are to replace the old church at the end of Newland Avenue. The present buildings are only part of the whole scheme. The complete scheme provides for the erection of a new chapel, to be built on the site adjoining the present buildings, which are designed for Sunday-schools, with a large central hall. This large central hall provides accommodation for a congregation of 700, and the classrooms for 400 or 500 scholars. The total cost of the present buildings is about £7,000.

STANDARDIZATION OF BRICKS.

CONFERENCE AT THE ROYAL AGRICULTURAL HALL.

A conference between representatives of the Royal Institute of British Architects, the Institution of Civil Engineers, and brickmakers, was held at the Royal Agricultural Hall, Islington, on Friday afternoon last, to discuss the question of standardizing the size of bricks. Mr. Thomas Blashill (late superintending architect to the London County Council), who presided, remarked that a great difficulty arose by reason of the varying sizes of bricks needed to be used in the same wall, and it was very desirable that some standard should be determined.

Mr. Searles-Wood (the hon. secretary) read the resolutions drawn up by a joint committee of the two institutions named above. These were as follows:

The length of the brick to be double the width plus the thickness of one vertical joint.

Brickwork to measure four courses of bricks and four joints to a foot.

Joints to be $\frac{1}{4}$in. thick and an extra $\frac{1}{16}$in., making $\frac{5}{16}$in., for the bed joints, to cover irregularities in the bricks, thus giving a standard length of $9\frac{1}{4}$in. centre to centre of joints.

The bricks to be measured in the following manner:

Eight stretchers laid square end and splay end in contact in a straight line to measure 72in.

Eight headers laid side by side frog upwards in a straight line to measure 35in.

Eight bricks laid, the first brick frog downwards and then alternately frog to frog and back to back, to measure $21\frac{1}{2}$in.

The foregoing to apply to all classes of walling bricks, both machine and hand made, and facing bricks.

The Secretary then read three letters which had been received respecting the matter.

The first was from Messrs. Thomas Lawrence & Sons, of Bracknell, Berks, who wrote agreeing with the idea of standardizing bricks, but pointed out with regard to red bricks that there were bound to be some from the bottom part of the kiln which would be shorter than those from the upper part; in fact, to burn the darkest red colour it was necessary or usual to burn these bricks on end, with the result that the weight of the bricks above and the heat of the fire below often made them shrink nearly $\frac{1}{2}$in. in the length. As the dark red was the most difficult colour to obtain, Messrs. Lawrence saw very serious objection to it being specified in contracts that bricks should be of the standard size.

Mr. E. Holwill, of Temple Chambers, London, wrote saying that he considered the most simple rule to adopt would be that the size of bricks should be such that they should, in the work, run four to the yard and rise four to the foot (this enabling the quantity to be easily estimated at per ft. super. or per yd. super.). The foregoing included joints, and the width of a brick should be half the length less the thickness of the joint. The question then became one of thickness of joint; different classes of bricks necessarily requiring different thicknesses of joint. Glazed bricks and some kinds of facing bricks required $\frac{1}{8}$in. joint, and the sizes of these would then be $8\frac{7}{8}$in. by $4\frac{3}{8}$in. by $2\frac{7}{8}$in. For bricks requiring $\frac{1}{4}$in. joint the sizes would be less by $\frac{1}{8}$in., namely, $8\frac{3}{4}$in. by $4\frac{1}{4}$in. by $2\frac{3}{4}$in. Mr. Holwill said he had worked on the above rule and found it adjust itself to present requirements, giving less trouble than in cases where other sized bricks had been introduced. In his experience the question of the thickness of the joint had been the greater source of trouble.

Messrs. A. & C. Harston, architects, of Leadenhall Street, wrote expressing the opinion that, given true bricks and good mortar, with sharp and perfectly clean sand, a $\frac{5}{16}$in. joint for beds was an excellent thickness—better than $\frac{1}{4}$in., both in appearance and strength. The size of brick they endeavoured to promulgate was one $8\frac{7}{8}$in. long, $4\frac{1}{4}$in. wide, and $2\frac{5}{8}$in. thick. There was a difficulty in making London stocks and true-shaped facing bricks of exactly the same dimensions, and they thought there might be a rule that the latter should be thicker in each dimension by $\frac{1}{16}$in. or $\frac{1}{4}$in.

After these letters had been read the Chairman referred to the diversity of opinions expressed, and desired to know the views of the conference.

Mr. Joplin pointed out that the alteration of dies could be easily effected, but there was a great difficulty in the burning of the bricks, and he thought the variation arising from that cause would be in excess of what would be allowed from the standard. Another difficulty would be raised from the fact that some brickmakers would not care what the standard was so long as they could sell their bricks. As regards a standard brick, he considered one 8¾in. by 4¼in. to be satisfactory; the thickness was not so important as the width. He felt there should be a committee representing the brickmaking interests to decide what the standard should be. Then, if the specifying professions would observe that standard, the main difficulty would be over.

Asked by the Chairman what he thought was the variation in bricks required to be 9in. long, Mr. Joplin said that the minimum length might be as low as 8⅝in., but the maximum could be but little in excess of the 9in.

Mr. H. W. Richards (Northern Polytechnic) thought it mattered very little what the length was so long as there was a proper proportion between header and stretcher; and the great difficulty was in maintaining that proportion. He found that the bricks in the North of England were much thicker than those in the South. In his opinion it should be stipulated that bricks were not to be made of more than a certain thickness.

Mr. J. C. Hill, of Peterborough (chairman of the Clayworkers' Institute), said it was very difficult to determine what the shrinkage in a particular brick would be. There was also the difficulty arising from the wearing of boxes, the die becoming smaller and the boxes larger; and as repairs, say, to a row of machines could not be carried out all at one time there would be a slight variation in the size of the bricks produced. But still, this was very little as compared with wire-cut or slop-made bricks. They experienced continual difficulty in executing orders for bricks 3in. thick, as used in railway work. He thought it would be sufficient for the Committee to settle the standard and then leave the matter with the brickmakers, who, if they disregarded the standard, would soon suffer for their indifference, provided the architects and engineers thoroughly maintained their requirements.

Mr. George Wragge (chairman of the Kent and Essex Brickmakers' Association) said that as somewhat of a large stock-brick maker the term "slop-made" brick was painful to him. If they had not the advantages of Fletton they did endeavour to make and burn a brick which, he thought, was one of the best in this country, if not in the world. Brickmakers were quite capable of making any kind or size of brick required provided architects and engineers would pay the price; but these asked for the very best brick at the lowest price. The further South one went the smaller were the bricks. They were smallest in Italy, then in Holland they were 2in. thick, in London 2½in., while in Edinburgh the thickness increased to 3in. and 3½in. It would be an advantage if a standard size were determined. In 1898 his Association suggested that bricks 8⅞in. by $4\frac{3}{16}$in. by 2⅝in. would be the best so far as London was concerned. He referred to the case in which bricks of a "golden colour" were asked for, and wanted to know whether, with eight stretchers to measure 72in., this 72in. was to apply to such bricks *and* to best stocks.

Mr. Bernard Dicksee said the Committee, when considering this question, had to determine what size brick was most used in practice, and they selected as their standard one that was 9¼in. centre to centre of joints. He remarked with regard to stocks that many bricks were supplied as such which could not properly be so described.

Mr. S. E. Collier (Reading) thought a brick should be rather less in width than half the length. If it were possible to get the different brickmakers to agree to adopt a standard the object might be attained in course of time.

Mr. Goodenough (Sittingbourne) asked whether it was possible to stipulate that bricks from all parts of the country should be of a standard size. Till all earths and their manipulation were the same it was not possible. With clamp-burnt bricks the kind of earth used was specially important, for the shrinkage was determined by the proportion of water and whether the earth was "strong" or not. Then there was the drying and the variation of the heat during burning. The shrinkage between a well-burnt stock and a mild-burnt stock was not very great, but if a standard was to be determined it would be almost impossible for any maker to enter into a contract unless he had a price which would enable him to practically throw away all those bricks which did not exactly conform to requirements.

The Chairman suggested as a practical way of arriving at some decision that they might pass a resolution that it was desirable to get bricks as much alike as possible. This was seconded by Mr. Richards.

Mr. Bates (teacher of brickwork at the Northampton Institute and Chelsea Polytechnic) expressed the opinion that the great thing to have was proper proportion between length and breadth. Brickwork was executed cheaper in America, and he asked whether it was not a fact that bricks were smaller there. He strongly advised that, if the size were altered, bricks should not be made larger.

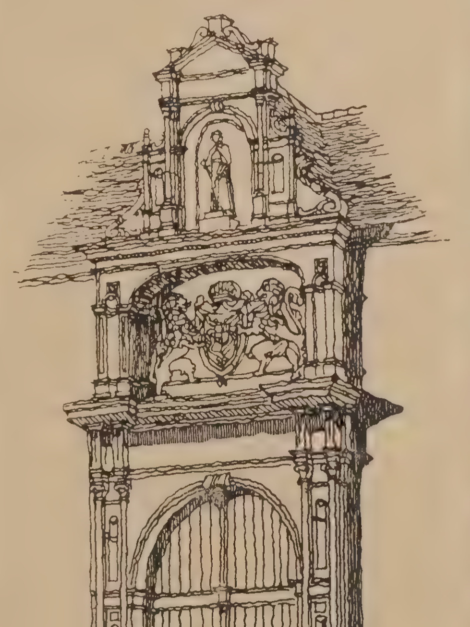
Mr. Hill thought some distinction should be made between a facing and an inside brick. There should be a standard size for facing bricks and one slightly smaller for inside bricks, as this best suited contractors' needs; they did not wish to "hammer down" the inside bricks.

Mr. A. Saxon Snell said what they wanted was a uniformity in the mortar joint; a thick joint meant settlement. Of course if cement were used it did not matter.

Mr. Radford remarked that not twenty-five per cent. of bricks were made to specifications. Builders bought just what they liked, and if architects specified a certain size those bricks which did not conform to it could easily be disposed of to the builders.

Mr. Blizard spoke, and Mr. Searles-Wood then put the following resolution to the meeting: "That it is desirable to form a committee to consider the propriety of standardizing the size of bricks." It was asked whether the North were to come down or the South to go up, but the resolution was carried. Steps will be taken to form as representative a committee as possible.

The R.I.B.A. June Examinations.—The June examinations of the Royal Institute will be held on the following dates: the Preliminary Examination on the 11th and 12th June, 1901. Applications must be sent in on or before the 4th May. The Intermediate Examination on the 11th, 12th, 13th, and 14th June, 1901. Applications must be sent in on or before the 4th May. The Final and Special Examinations from the 21st to the 28th June, 1901. Applications must be sent in on or before the 24th May, 1901. The testimonies of study, &c., with the necessary fees, must accompany the applications.



ENTRANCE TO THE TRIBUNAL, MALINES.
DRAWN BY E. STANLEY MITTON.

Law Cases.

Building without Depositing Plans: Another Case.—At Walsall recently Frank Pardoe, saddlery manufacturer, was summoned for erecting a building without the sanction of the Corporation, and without having deposited plans. The borough surveyor (Mr. R. H. Middleton) stated that the defendant had erected a workshop which was not in compliance with the Corporation by-laws, and which the Streets Committee would not allow to be occupied. There had been several similar prosecutions, but people continued to put up these buildings without depositing plans in the hope that they would not be found out. If undetected they escaped payment of rates. Defendant was fined 40s. and costs.

The Brompton Road Improvement.—The arbitration to assess the compensation to be paid to Messrs. Metcalf & Greig, architects and surveyors, for land in Brompton Road, between Brompton Square and Cheval Place, which has been acquired compulsorily by the Borough Council of Kensington for the purpose of widening the road, was concluded on April 20th at the Surveyors' Institution, Westminster. Mr. H. H. Collins put in the amended plans of the proposed block of residential flats. In these plans he had abandoned the seventh floor, which, according to the County Council regulations, could not be built without the provision of a fire escape, and has made the front of the building in Brompton Square. By this means he had been able to increase the size of the rooms. He estimated the rental of the eleven flats at £2,450 per annum, from which he deducted £800 for expenses, and £700 for ground-rent, leaving a nett profit of £950. He estimated the leasehold interest at sixteen and a half years' purchase, which, with the usual 10 per cent., amounted to £17,242. The ground-rent of £700 he estimated, at twenty-six years' purchase, at £20,000. From the total he deducted £8,000 for the cost of completing the building, which made his valuation £29,242. Mr. A. R. Stenning, surveyor, the first witness for the borough council, expressed the opinion that the claimants' original plans could not have been carried out, and that the amended plans of Mr. Collins were in many respects open to question. In his view the best plan for utilising the land would be to provide three shops in Brompton Road, with three floors of residential flats above. The ground-rent of £700 which had been created was an impossible rent, and could not be secured by any building which could be erected on the land. The umpire reserved his award.

Unfenced Planing Machines.—In the King's Bench Division of the High Court of Justice the case of *Cramp* v. *J. Garrett & Son* was recently heard. Plaintiff brought an action against the defendants (who are builders, of Balham Hill) for personal injuries alleged to have been sustained through a breach of the Factory Acts on the part of the defendants. Defendants denied liability. In the alternative they paid £150 into court as sufficient to satisfy the plaintiff's claim. In October last the plaintiff, who had been in the employ of the defendants for some time as a machinist, was working on an overhand planing machine when his foot slipped, and his left hand came into contact with the cutters, with the result that three fingers were cut off. The plaintiff alleged that his injuries were attributable to the neglect of the defendants in omitting to have the machine properly fenced or guarded in accordance with the Factory Acts. At the time of the accident plaintiff was in receipt of 32s. per week, and he now contended that he would not be able to follow his employment in the future. Defendants denied that they had been guilty of any negligence. They said that after the factory inspector had ordered a guard to be fitted to this particular machine they had one made, and instructed their foreman to put it on the machine. Unfortunately, the foreman did not put it on owing to the fact that the spring of the guard had been lost, and defendants said that if the plaintiff met his accident through negligence it was the negligence of their foreman in not carrying out their instructions. The jury found a verdict for the plaintiff, and assessed the damages at £300. Judgment accordingly with costs.

"Opalite": Infringement of Patent.—In the Chancery Division of the High Court of Justice last week Mr. Justice Cozens Hardy delivered judgment in the case of the *National Opalite Glazed Brick and Tile Syndicate* v. *The New Grand Hotel, Birmingham.* The action was one in which the plaintiffs, as assignees of Shelmerdine's patent of 1893 for affixing a glazed surface to walls, claimed relief in respect of an alleged infringement by the defendants.—His Lordship declared that the plaintiffs' patent was valid, that the defendants had infringed the patent, and he gave the plaintiffs the consequential relief. Defendants must pay the costs of the action. His Lordship also granted a certificate that the breaches had been proved, and awarded the plaintiffs damages, to be ascertained by enquiry.

The Employment of Girls in Brick Factories.—The case of *Squire* v. *Stanley Brothers, Ltd.*, was heard in the King's Bench Division of the High Court of Justice on Wednesday last. This was an appeal, by case stated, from the decision of justices of Warwickshire, sitting at Nuneaton, dismissing an information preferred by the appellant, an inspector of factories, against the respondents charging them with having unlawfully employed girls under sixteen years of age in their brick factory at Stockingford contrary to the Factory and Workshop Act, 1878. The schedule of this Act provides that "in a factory or workshop in which there is carried on (*a*) the making or finishing of bricks or tiles, not being ornamental tiles . . . a girl under the age of sixteen shall not be employed." Upon the hearing of the information the following facts were proved or admitted: The respondents made at the factory in question plain and glazed or enamelled bricks, both white and coloured, and also (*inter alia*) impressed glazed bricks. Two girls, Ellen Masser and Elizabeth Meacham, who were under the age of sixteen on July 16th, 1900, had for some time previous to that date been employed by the respondents in the factory. These girls were employed in carrying four or five (or a less number) of plain bricks from the dust kilns to the dipping sheds, where they were stacked and glazed by the dippers; also in carrying the bricks after they had been glazed from the dippers in the sheds to another place in the same sheds, where they were knifed or scraped; in carrying them from the sheds to the ovens, where the glazed bricks were baked and polished; and occasionally, but not often, in carrying the baked and polished bricks to the final stacking sheds. Eliza Meacham was, on the day in question and for a week at a time during the period of her employment, also employed in actually dipping the face of the bricks in the glaze. It was contended on behalf of the appellant that by the combined effect of section 38 of the Factory and Workshop Act, 1878, and the first schedule of it, there was an absolute prohibition against the employment, in any place within the close or curtilage of a factory where bricks were made or finished, of girls under the age of sixteen years, and further that the processes performed upon the rough bricks constituted a finishing of bricks within the meaning of the first schedule of the Act. On the part of the respondents it was contended that there was no absolute prohibition as alleged, but only a prohibition to employ girls under sixteen in the processes of making and finishing bricks and that the above processes did not constitute a finishing of bricks. The justices were of opinion that the contention of the respondents was correct. The Court allowed the appeal. The Lord Chief Justice said that he did not wish to express any opinion as to whether there was an absolute prohibition against employing girls under sixteen in factories for making bricks. He was clearly of opinion that what was done in the part of the factory where the girls were employed was finishing of bricks, within the meaning of the first schedule to the Act. The case must go back to the justices. Mr. Justice Lawrance concurred.

Fire-resisting Construction between Trade and Private Premises.—The case of *Dicksee* v. *Hoskins* was heard last week in the King's Bench Division of the High Court of Justice. This was an appeal from the decision of a metropolitan police magistrate allowing an appeal under the London Building Act, 1894, from a notice of objection to a proposed building served by the appellant, who is a district surveyor under the Act, upon the respondent, a builder. The proposed building was situated at No. 87, Old Kent Road, and was the re-erection of a licensed beerhouse on the site of an old beerhouse called the "Horse Shoe." The trade of the beerhouse was to be carried on in the basement and on the ground floor, and the licensee and his family were to reside in the upper floors of the building. The whole of the building was to be covered by the justices' certificate and Excise licence. The floors separating the ground floor from the first floor and the staircase leading to the first floor were not intended to be constructed of fire-resisting materials, and the learned magistrate found that, if sub-section 2 of section 74 of the London Building Act, 1894, applied to the building, the provisions of that section would be contravened. (Reports of the case when heard in the Southwark Police Court, were published in our issues for October 24th and 31st last). The learned magistrate also found as a fact that the basement and ground floor of the building were intended to be used for the purposes of the trade of a beerhouse, and that the part above the ground floor was intended to be used as a dwelling-house for the licensed occupier, but held that the case was governed by the decision in *Carritt* v. *Godson* (1899, 2 Q.B., 193), and allowed the appeal and overruled the objection of the district surveyor. The district surveyor appealed. The Court dismissed the appeal. The Lord Chief Justice said that he did not base his decision entirely on *Carritt* v. *Godson*, because in that case there was an additional ground for deciding that the house there in question was not within the London Building Act, 1894, section 74 (2)—namely, that the lobby which gave access to the staircase of the house opened into a back yard. In his opinion, the section was intended to apply to buildings part of which were used for trade and manufacture and the other part as a dwelling, and it was not intended to apply to a building certain rooms of which were used as a dwelling. The appeal would, therefore, be dismissed. Mr. Justice Lawrance concurred. He said that he agreed to the extension of the principle in *Carritt* v. *Godson* laid down by the Lord Chief Justice.

Builders' Notes.

In the Isle of Thanet Hospital the whole of the wood block floors are to be laid on the "Fawcett" system of Messrs. Mark, Fawcett & Co., of 50, Queen Anne's Gate, Westminster. There are about 2,500yd. Messrs. Langham & Osborne, of Ramsgate, are the architects.

Stephen Dustow, of Chobham Road, Stratford, died recently. In partnership with Mr. Thomas Knight—who survives him, at the great age of eighty-eight—he carried on active building operations for many years. It was in 1853 that the firm commenced this work.

An Exhibition of Carpentry and Joinery will be held in connection with the Carpenters and Joiners' Companies at Carpenters' Hall, London Wall, from Wednesday, June 5th, until Tuesday, June 18th. Exhibits of works in wood and wood carving must be delivered before Saturday, 11th inst.

An Exhibition of Inventions.—An addition of considerable technical and popular interest will be made to the many attractions announced for this month in connection with the Naval and Military Exhibition at the Crystal Palace. A section will be devoted to Inventions, Patents, and Designs connected more or less with naval and military matters, which will show the progress we have made since the days of the 1851 Exhibition. Inventors who wish to exhibit can get particulars of free spaces from the technical adviser and manager, Mr. Henry C. Braun, C.E., Inventors' Engineer and Specialist, 236 to 238, Pentonville Road, King's Cross, London.

Payment for Hoardings.—Recently Mr. Robert Allan, of Rankine Street, Dundee, wrote to the Works Committee of the Dundee Town Council drawing attention to the charge which is now being made by the Commissioners for portions of streets enclosed by hoardings during building operations. He agreed with the desire of the Commissioners that these hoardings should only be allowed to remain up during the minimum time required for the public safety and the due execution of the work to be done, but thought that the charges now being made were too heavy. These charges are 1s. 8d., and 4d. per sq. yd. per month, or equal to a rate of £18 3s., £12 2s., and £6 1s. per pole per annum. Dealing with this as it affected himself, it appears he was charged for ground enclosed by hoarding in one street, £12 2s. per pole; he was paying at the rate of 5s. per pole for this ground, so that the Commissioners were charging an extra rate for the temporary use of this ground nearly fifty times the amount of the feu. He suggested as a more effective way of securing the end in view that no charge—or only a small charge—should be made for the portion of street enclosed during a limited time fixed by the Commissioners or their engineer; and if the contractors exceeded this limited period, then the 1s. 8d. or 4d. rate should be put on for the remaining period. The burgh engineer has been asked to consider the matter.

A Fire Test with Two Iron Doors.—We have received No. 60 of the British Fire Prevention Committee's publications. It deals with a test made with an iron framed door with stiles and rails on both sides, and a similar door with stiles and rails on one side only, as frequently described in "Building Act" and "Insurance" specifications respectively. The object was to record the effect of a fierce fire lasting one hour, the temperature being gradually increased to 2,000 degs. Fahr., followed by the sudden application of water for five minutes. The door openings were 3ft. 3in. by 6ft. 9in. The fire was applied from one side, and the doors opened inwards on that side. The following is a summary of the effect: In five minutes the door with stiles and rails on one side only bulged inwards ¾in.; in eight minutes the other door bulged inwards ⅜in. above and below the centre fastenings; in eleven minutes the bulge on the door with stiles and rails on one side only increased to 2in., and in eighteen minutes to 2½in.; in fifty-nine minutes this door was red-hot almost all over, and one of the top corners was bent inwards ¾in., the bolt having dropped; in fifty-nine minutes also the other door was red-hot, and the bulging had increased to almost 1in.; but it will be seen that this door withstood the test much better than the door with stiles and rails on one side only. The panels in both doors were of ¼in. steel.

The Boom in the Building Trade of Inverurie consequent upon the decision of the Great North of Scotland Railway Company to remove their works from Aberdeen to that place still continues. The huge workshops are approaching completion. The main part of the new station has been almost finished, and operations have been commenced on the up platform and siding for the Oldmeldrum trains. The provision made by the railway company for the housing of their workmen is on an extensive scale, comprising, as it does, the erection of seven large blocks of buildings, providing accommodation for 112 families. Two of these blocks, containing sixteen four-roomed tenements each, face Harlaw Place, and the remaining five, so designed as to provide three rooms for each family living in them, form new streets, to be called King Street, Queen Street, and Princes Street. All the houses closely resemble each other in outward appearance, and they have been so arranged that only four tenants will use each of the entrance doors. Ample accommodation has been provided to the rear of the buildings, and no less than twenty-eight wash-houses have been erected. The sewerage system of the town is being extended along Harlaw Place so as to connect with the drains of the buildings. The contractors for the dwelling-houses are—Messrs. Ogg & Sons, Woodside, and Mr. John Smith, Kintore, masons; Mr. Hendry, Keith, carpenter; Messrs. James Laing & Son, plumbers; Messrs. J. & R. Seivwright, and Mr. R. Moir, Inverurie, plasterers; Mr. S. Christie, sen., Dyce, slater; and Mr. Wm. Duncan, Inverurie, contractor for the roads. Buildings other than those erected by the railway company have been rapidly springing up. In North Street the foundation of two new shops and a dwelling-house have been laid, and a commencement has been made with a new bakeshop at the end of Falconer Place—itself an entirely new street. Off Blackhall Road Messrs. Byre & Park, builders, Aberdeen, are erecting a large tenement house.

Keystones.

The New Public Baths and Wash-houses at Battersea, which have been erected by the Battersea Borough Council in the Nine Elms district at a cost of about £40,000, have been opened.

The Parish Church of Macclesfield, Cheshire, was opened last week after its restoration at a cost of £21,000. The original parish church of Macclesfield was founded by Queen Eleanor, wife of Edward I.

Skibo Castle has been undergoing considerable alterations for Mr. Andrew Carnegie. About £40,000 has been spent. The public apartments are all new, and special attention has been paid to the providing of a spacious library. Mr. Carnegie's favourite residence is five miles from Dornoch, Sutherlandshire, which is five miles from a railway station.

Profitable Artisans' Dwellings.—At last week's meeting of the Hornsey District Council, the Artisans' Dwellings Committee presented a report showing that the council's 108 dwellings at Hornsey had produced £1,073 during the last six months, and after paying off the half-yearly amount of principal and interest on £31,000 there remained a balance in hand of £483. The rents are 6s. 6d. and 9s. 6d. a week for a separate house and garden.

St. Ambrose School, Sandycroft, has been enlarged by the addition of a new building, which has been erected at the sole expense of the Sandycroft Foundry Company at a cost of £700. It has been designed by Mr. H. Swetenham, and is of red brick. Apportioned into two lofty rooms, which are wainscotted to harmonise with the old building and separated from the old room by means of a glass and wooden partition, it exactly doubles the accommodation of the school, bringing it to the number of 210. The dimensions of one room are 18ft. sq., and the other 32ft. by 18ft.

The Old Saxon Church at Overton, which is said to be the oldest ecclesiastical building in Lancashire, is unhappily proposed to be restored. It existed prior to the Norman conquest, and was restored about the twelfth century. The interior furnishings are of the quaintest description, and include an old three-decker pulpit with desks for preacher, reader and clerk, one of the very few yet existing in the country. The proposal is looked upon in antiquarian circles as little short of vandalism, and the resolution to apply for a faculty submitted to a meeting of parishioners was only carried by twenty four votes to twenty.

The New Rates Office at Bristol, in Broad Street, has been completed. The building is in continuation of the line of the Council House. A large public hall gives ample provision for the public on the outer side of a long counter, behind which full provision is made for the large staff of clerks. Behind this and underneath the new council room is a large apartment to be used by the collectors. Also on the ground floor is the office of the assistant overseer. On the first floor there are the offices of the city valuer and his staff, in the front portion of the building, while behind is a large room for the assistant overseer's staff. On the top floor is the room of the city valuer's draughtsmen, and behind this is the new office for the inspector under the Food and Drugs Act and the Shop Hours Act.

A New Wesleyan Church at Platt Bridge, Wigan, is being erected. The church is to be in the Gothic style, and will consist of a nave 68ft. long by 39ft. wide and transepts 48ft. 6in. wide inside measurements. There is an end gallery, and accommodation will be provided for a mixed congregation of 650 persons. The church is to have an octagonal apse for chancel and organ chamber alongside it. At the rear there will be two vestries, one for the choir, and one for the minister, each supplied with lavatory, &c. There is also a church parlour, each capable of seating 100 people. At the front end there are to be two cloak-rooms, to be used by the congregation. The walls are built of best pressed brick, with stone dressings, and the seats, pulpits, and other joinery of pitch-pine. The cost will be about £4,000. The architect is Mr. John Wills, F.S.Sc., of Derby and London, and the contractor is Mr. David A. Ablett, of Wigan.

A Lych Gate has been erected at the northern entrance of All Saints' Church, Hollingbourne, as a memorial of the late Mr. R. G. de V. Thomas. It was carried out by Messrs. Harry Hems & Sons, of Exeter, and is of English oak, in the Early English style.

New Public Swimming Baths at Beckenham have been erected by the District Council on the land on which the old Clock House stood. A technical institute is also being erected in connection with the baths. They have been designed by Mr. Angell, the Council's surveyor, and the total cost is estimated at about £26,000.

The New Church of St. Martin, Upper Knowle, has just been consecrated. The building is designed to eventually accommodate 700 persons; but the work completed is limited to the chancel, vestries, &c., and two bays of the nave. The style of architecture is Early English, and the building is of pennant stone with Bath stone dressings. The portion completed will cost about £3,000. Mr. W. V. Gough is the architect, and Mr. Maton Durnford the contractor.

Queen Street, Glasgow.—The National Bank buildings are about to give place to a large warehouse which is being erected for Messrs. Hunter, Burr & Co. warehousemen, of Jamaica Street. The style is Renaissance, and the architects are Messrs. H. & D. Barclay, Glasgow. It will consist of seven storeys, and the ground floor will be reserved for shops. A main doorway in the centre of the building will give access to the upper flats, which are to be occupied by the firm themselves.

What Bristol is Doing to House its Working Classes.—For years it has been the subject of complaint on the part of some of those specially interested in questions affecting the welfare of the working classes that the Bristol Corporation, while by street improvements destroying many of the old rookeries in which scores of familes lived, had done absolutely nothing to put in force the constructive provisions of Acts of Parliament passed with a view to facilitating the provision of dwellings for the labouring classes. The Corporation now has twenty new houses ready for occupation; sixteen dwellings upon which the contractors have almost but not quite finished their work; twenty-four in less advanced stages; and ten more, the erection of which has been sanctioned by the council, but which as yet exist only on the plans in the drawing office of the city engineer.

The New Union Church at Lynn has been opened in Wisbech Road. It is a cruciform building, with nave, aisles, transepts and square apse used for the organ and choir gallery. The general design is a modified form of the Early English style, with light arches and pillars dividing the aisles from the nave, double lancet windows in the aisles and quatrefoiled circular windows in the clearstory glazed with coloured glass. The rear wall is lighted with a group of five lancets, the transepts by three each; while over the organ is a circular window with two small lancets on either side. The roof is of open beam work in light, varnished wood. The organ, rostrum and general seating have been removed from the old church. The new church is 60ft. by 40ft., with seating for 320 persons, and has been built by Mr. W. F. Smith from designs by Mr. J. L. Carnell, Tuesday Market Place, Lynn.

Housing at Birmingham.—The Housing Committee of the City Council are considering certain schemes for the erection of an experimental block of tenements on the flat system in Potter Street. The plans of four schemes had been prepared, and these provide for the erection of four-storey blocks, each containing from sixty to seventy tenements, with frontages in Potter Street and Staniforth Street. The committee recently had an interview with Messrs. Newton, Crouch, McEwan, and Buckland, who attended as a deputation from the Birmingham Architectural Association for the purpose of asking that the plans for the erection of dwellings should be thrown open to competition. It was pointed out, however, that the plans for the proposed buildings in Potter Street and at Bordesley Green were too far advanced for the committee to comply with the request of the architects, but a hint was given them that in any future scheme their views will be favourably considered.

A Cottage Hospital at Sleaford is to be erected as a memorial to Queen Victoria.

New Board Schools at Cleethorpes are to be erected in Bursar Street, at a cost of £13,530, including £1,452 the price of the site. Accommodation will be provided for 360 boys, 360 girls, and 230 infants.

Mount Tabor Chapel, Stockport, has been reopened, after improvements in the interior at the total cost of £400. The electric light has been introduced, the place has been re-decorated and the ventilation improved.

Boothroyd Church is proposed to be renovated, and a faculty is to be applied for. The things to be taken in hand are the thorough overhauling of the organ, the cleaning of the walls, roof and general repairs, the extension of the chancel and the heating apparatus. The estimated cost is £2,500.

The Restorations in the Castle of St. Angelo, Rome, which are now being carried out, have resulted in the discovery of some curious frescoes of the fifteenth century. It is even hoped that possibly thick coatings of whitewash still cover the frescoes by Pinturrichio representing the whole of the Borgia family. It is known that such frescoes existed in the time of Julius II.

The Tom Hughes Memorial.—£6,000 has been subscribed towards the scheme for the erection of additional buildings at the Working Men's College in Great Ormond Street as a memorial of the late Tom Hughes, a former principal of the institution. In all a sum of not less than £15,000 will be required for the erection of lecture rooms, a laboratory, and for other purposes, but as soon as £8,000 has been subscribed it is proposed to begin building operations.

A Discovery has been made in the course of the excavations now in progress just outside St. Bride's Churchyard, Fleet Street, of a cast either of a sculptured bust or of a human face. Probability points to the former, as the features are of the purest Hellenic type, and one of the British Museum authorities is of opinion that it represents the head of Pallas Athenæ. The cast, which was discovered at a stratum in the foundations known to be 200 years old, reposes temporarily in the parish church of St. Bride.

"The New Century Hotel" is the name of a building situated in Holm Street, Glasgow, which is unique of its kind. It is a poor man's house, and is a kind of half-way house between the lodging-houses and the palatial West End palaces. Mr. Thomas Paxton, who has in the past achieved successes in the model lodging-houses under Glasgow Corporation, and more recently on his own behalf, is responsible for the inception and carrying out of the scheme. The hotel has seven flats and 400 single cubicle bedrooms. Messrs. Frank Burnett & Boston were the architects.

The New Swiss House of Assembly is expected to be opened at Berne this year or early next. The chief building is already nearly completed. The buildings are situated in Berne Place, and will be the future place of assembly of both Houses of the Swiss Parliament, the Council of State, and the Conseil Nationale, the representatives of the cantons and the representatives elected on the basis of one representative to each 20,000 of the population. The building faces north. Behind it are the Alps and the Bernese Oberland, and the buildings in front of it are to be cleared to make a great square. To east and west in the Berne Place are other Government buildings—the War Office, Home Office, and Treasury.

The Demolition of Seven Historic Houses at Windsor, which were good examples of the architecture of the reign of Charles I., has been begun by the Corporation. The houses adjoin the present vicarage of Windsor, which formerly was a residence attached to Windsor Castle. They also adjoin a large piece of waste Crown land which was offered to the Corporation some time ago. Upon this and the site rendered vacant by the demolition of the houses, it was proposed to erect a Volunteer drill hall, as a memorial to the late Prince Christian Victor, but the project fell through owing to lack of support. The Corporation have condemned the houses—their own property—as unfit for human habitation, and their destruction will remove one of the most interesting landmarks in Windsor.

Mr. W. J. Hale, of St. James Row, Sheffield, has been made a fellow of the Royal Institute of British Architects in accordance with the unanimous recommendation of the Council of the Sheffield Society of Architects.

Messrs. F. McNeill & Co.: a Correction.—We regret that in our notice of the exhibit of Messrs. F. McNeill & Co. at the Building Trades' Exhibition (see page i of the supplement to our last issue) the price of their fibrous asphalt was given as 7s. 6d. per yard super. instead of 1s. 6d.

A Wigan Competition.—Mr. John B. Thornley, architect, of Darwen and Blackpool, has been successful in a competition for a large block of buildings in Wigan, including arcade, shops, suites of offices and assembly-halls. The premises are estimated to cost about £35,000.

Engineering Notes.

Institution of Civil Engineers.—At the ordinary meeting on April 23rd, Mr. James Mansergh (president) in the chair, it was announced that three associate members had been transferred to the class of members: Messrs. R. A. Carr, G. W. Partridge and H. P. B. Rigby. The last ballot of the session resulted in the election of one honorary member, Mr. James Dewar, M.A., LL.D., F.R.S.; six members, Messrs. A. M. J. Alby (Paris), W. F. Brown (Cardiff), W. R. Herring (Edinburgh), M. R. Mellor (Coatzacoalcos, Mexico), F. Mills (Ebbw Vale, Mon.) and P. Watts (Newcastle-upon-Tyne); and fifteen associate members, Messrs. W. C. Carter (London), H. M. Clarke (Perth, West Australia), R. S. Cole, M.A. (Cantab.) (Edinburgh), A. M. Downie, B.Sc. (Glasgow), Stud. Inst. C.E. (Glasgow), F. A. Hurley, F.C.H. (Egypt), A. J. Irwin, B.A.I. (Dublin) (Bangkok, Siam), A. C. Kelley, Stud. Inst. C.E. (London), J. Kirkland, B.Sc. (Victoria) (London), J. Lord (Halifax). J. C. O'Connell, B.E. (Royal) (Athlone), G. H. Pearson, Stud. Inst. C.E. (New Swindon), D. W. Ross (London), W. H. B. Savile, Stud. Inst. C.E. (Hull), S. A. Smith (Manchester) and R. E. Wright (Cape Town).

Yarmouth Harbour is being considerably improved, and the first section has just been completed. This is the construction of a new quay heading upon the South Quay, and the provision of deep water berths that will enable the largest steamers using the port to come to this quay. The scheme provides for repiling the whole length of the South Quay from the Bridge to Friar's Lane. The portion now completed is from the Bridge almost to the crane, roughly, perhaps one-half of the total of the quayage to be reconstructed, which will cover a distance of 2,200ft. The expenditure involved will be not less than £20,000. The work is being done by the Port and Haven Commissioners' own staff, under the superintendence of their engineer, Mr. J. Green. Huge wooden piles, ranging up to 40ft. in length, iron shod, and 12in. square, of memel fir or pitch pine, creosoted at the Commissioners' works at Gorleston, have been driven in front of the old quay heading by a steam pile. At intervals all the main piles are secured to dwarf piles, driven below the surface of the roadway, by steel tie rods, some 20ft. in length. At the exposed ends of the pile a massive timber capping has been bolted to the logs. The raising of the quay left the quay tramway at too low a level, while earth filling at the back was also required. The metals have therefore been placed on a higher level, and the "four foot" paved with granite setts. The cost is estimated at £8 12s. per foot run.

The New Pavilions at the Fever Hospital, Blackburn, are being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves, with ornamental tiled sides and with descending smoke flues, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

The First Metal Railway Bridge ever erected has just been removed from the position it has occupied for nearly eighty years, being erected in the year 1823 across the River Gauntless, at the western extremity of the original railway line at St. Helens. The framework was entirely composed of cast iron, resting upon ordinary stone foundations in the river. In consequence of the developments in the coal trade in the vicinity, the old bridge has been replaced by a more massive structure, to carry the heavy mineral engines and loads now in vogue upon the North Eastern Railway. Doubt exists as to the identity of the engineer of the old bridge. It is claimed that the plans and specifications were those of George Stephenson and John Dixon, while others suggest that a Mr. Storey—probably Mr. T. Storey, at one time engineer of the old Stockton and Darlington Railway—superintended its erection. At that period civil engineering was scarcely recognised as a distinct profession; the bridges erected previously to the year 1825 were constructed by either architects or millwrights. Bonomi, of Durham, was the architect employed to build the first bridge on the Stockton and Darlington Railway at Darlington. The first iron road bridge built in England is that at Ironbridge, Shropshire, which was erected in 1779.

Trade and Craft.

The following are some supplementary notices of the Building Trades' Exhibition:—

BRITISH LUXFER PRISM SYNDICATE.

The British Luxfer Prism Syndicate, Ltd., of 16, Hill Street, Finsbury, E.C., have executed a very effective piece of basement lighting in Old Jewry Chambers. The width of the roadway is 25ft., the height of the buildings on each side 60ft., and the aperture for light, so far as windows are concerned, only 10in.; but, despite these unfavourable circumstances, Luxfer prisms in combination with vertical prism plates (called "Lucidux frames") were put in with such success that the dark passages have been made bright, and dingy lumber rooms turned into well-lighted offices commanding a high rent. The multi-prism pavement lights are made of the best clear crystal glass, and the vertical prism plates are made with prisms at a variety of angles to suit different requirements; for by their use the light, instead of being thrown to the floor and there lost, is projected at a higher level, thus making the lighting very much more effective. Luxfer prisms have been tested by the British Fire Prevention Committee with marked success. Another speciality of the firm is the electro-copper glazing. Strips of copper are placed between the panes in "leaded-lights," and copper is deposited on them till the whole is firmly held—in fact, so firmly that no supporting bars are required.

THE AEROGRAPH CO., LTD.

Colours can be applied by the "Aerograph" very rapidly. The handpiece is like a stout pencil, and is used with the greatest freedom, while the range of work varies from a fine line to a solid band of colour almost an inch wide. The handpiece is connected to the air-pump by a length of rubber tubing. Besides this instrument, which is intended for artistic purposes, the firm also make the "Aerograph Spray-Painter." This is specially designed for decorators and painters, and the manner in which colours can be blended by its use needs to be seen to be fully appreciated. The sprayer is applicable to both oil and distemper colours, and it is possible to lay one tint over another without waiting for the first to thoroughly dry. The address of the firm is 30, Memorial Hall Buildings, Farringdon Street, E.C.

THE ARTISTIC TILE CO.

The Artistic Tile Co., of 35, Berners Street, W., make the Cloisonné hand-glazed tiles used largely for wall decoration, instead of the ordinary embossed tiles. This decorative tile is, however, sold at a price which is but slightly more than that of the ordinary tile, with which it is in fact being used to form many beautiful designs. Another speciality of this firm is white terra-cotta, and judging from the price of 15s. per foot. run quoted for 2ft. 6in. balustrade, including cap and base shown at the stand at the Exhibition, this material should prove most useful as a substitute for stone. At the same stand the Architectural Fitments Co. also showed a fine mantelpiece and a chimney-piece in carved walnut of Renaissance design, and some good examples in wrought-iron and wood as applied to door-furniture, balustrades, bridges, grates and fencing.

OATES & GREEN, LTD.

This firm, whose address is at Halifax, have just opened a London office and showrooms, at 27, Chancery Lane, W.C. Messrs. Oates & Green make excellent quality glazed bricks of all kinds. Their heavy fireclay lavatory basins with self-contained overflow are made, either on pedestals, with lugs to build into wall, in ranges or triangular for corners. These are largely used in schools, and admirably resist rough usage. The firm also supply the lavatory taps and waste plugs, and their automatic flushing tanks, trough closets and latrines are most useful. A large number of patterns of polished hard wood closet seats are made. The circular and patent taper urinals in glazed ware are now well known. Their new "Beresford Fire" is built of glazed firebricks, the back of the fire being so formed as to give one and three-quarter times the area of radiating surface; these fires burn soft coal, coke and anthracite. The thorough combustion of every kind of fuel occurs, only a small quantity of fine ash being left. A rub with a dry cloth is all that is necessary to clean them, and the ash can be readily removed, whether the fire is burning or not. These fires were "Highly Commended" by the Smoke Abatement Committee. Other specialities are heavy fireclay sinks and wash-tubs, gulleys, access pipes, interceptors, and channel siphons and bends and sanitary tubes with diameters from 18in. to 42in. in 3ft. and 3ft. 6in. in lengths.

YORKSHIRE PATENT GLAZING CO.

The chief features of the "Premier" system of glazing (the patent of the Yorkshire Patent Glazing Co., of Liversedge) are that it is perfectly dust-proof and water tight, does not need putty, allows for the full expansion and contraction of the glass, has no drip whatever from condensation, and absorbs any vibration from machinery and other causes. The glass is held tightly between asbestos cords, fitting, on the bottom side, into grooves in the steel supporting bar, and, on the other, in grooves in the zinc or copper capping-piece. The system is suitable for all kinds of roofing, and enables curved roofs to be glazed with straight glass.

STANLEY BROTHERS, LTD.

Messrs. Stanley Brothers, Ltd., of Nuneaton, make a special object to produce good work. Their chimney pots—to be obtained in a variety of patterns—ridges, finials, and tiles are all well made and of good quality, and they are also of a very deep red colour. Glazed bricks of every kind can be procured from them, and their stand at the Exhibition showed the large selection available, and the manner in which one colour blended with another. Of these bricks the salt-glazed possess a perfectly smooth surface, while the grey ones give the wall the appearance of its being built in granite. Architects needing goods of best quality should apply to this firm.

ADAMS' PATENT SEWAGE LIFT CO.

The Adams' Patent Sewage Lift Co., engineers, of York and Westminster, showed, in addition to penstocks, flap valves, &c., their "Automat" apparatus for operating various types of bacteria beds and sewage filters. The timed siphons and supply apparatus controlled by air transmission, Mr. Adams' latest inventions, fulfil—variously arranged—every requirement for handling sewage, whether upon "contact beds" (Mr. Dibden's system) or for the distribution of sewage in spray or in bulk upon "continuous" filters. The principle chiefly employed is the air lock. This is formed within the interior of a siphonic apparatus by means of air displaced by rising liquid and transmitted through suitable pipes to the interior of the apparatus. The air lock thus formed stops the passage of liquid; its release again brings on the supply. For supplying filters on the "continuous" system, either in spray or bulk, the alternating siphons are specially useful. Placed in one chamber these discharge its liquid contents alternately to one or other of two filters, thus securing very long periods of rest for recuperation, which enables the filters to deal with a volume which would be otherwise impossible. The firm manufacture automatic apparatus for every description of sewage filter and sewer flushing work.

MILLARS' KARRI & JARRAH FORESTS, LTD.

Millars' well-known "Swan" brand Karri and Jarrah timbers undoubtedly are among the finest woods for street-paving, as owing to their toughness and closeness of grain they are practically non-absorbent and most durable, and being members of the eucalyptus family are antiseptic. The woods are used in almost every town of any dimensions in the kingdom. The address of Millars' Karri and Jarrah Forests, Ltd., is 72, Bishopsgate Street Within, E.C. Their mills at Purfleet, on the Thames, are capable of turning out a million blocks per week, and for the year ended December 31st, 1900, the Company's mills turned out the record quantity of 90,862 loads, equal to 54,517,200 ft. sup. 1in. thick. The woods are also used largely for sleepers, crossing and bridge timbers, harbour and pier works, and carriage and waggon building. Their great density renders them practically impervious to moisture, and no creosoting is necessary.

A. W. GREEN & CO.

Green's improved patent fireproof, sound-proof and ventilated floors are formed with hollow lintels and flat tiles, made from a mild tempered clay capable of sustaining a high temperature. No centering is required; the hollow lintels and flat tiles themselves constitute this, and the ceilings can be plastered immediately after fixing. The floors will sustain a safe working or live load of from 1 cwt. to 5 cwt. per ft. sup. The soffits of the hollow lintels and flat tiles are grooved so as to form a dovetail key for the plaster, but they can be had plain for places where a finished ceiling is not required, or glazed. The hollow lintels are slotted through at each end so as to bear upon the bottom flanges of the rolled steel joists, and thus protect them from exposure to fire. The address of Messrs. Green & Co. is 35, Gorst Road, Wandsworth Common, S.W.

ARMOURED CONCRETE CONSTRUCTION CO., LTD.

This firm, whose address is 5, Westminster Palace Gardens, Artillery Row, Westminster, are introducing armoured concrete construction, largely used on the Continent, into this country. Armoured concrete is formed by using iron, generally in the form of rods, in combination with Portland-cement concrete, which render the concrete capable of resisting enormous tensile stress. It is claimed that armoured concrete is from 15 to 20 per cent. less costly than iron and steel construction, strength for strength. The great advantages claimed for this system of construction are: great strength and stability, elasticity and pliancy, economy in construction, indestructibility, non-corrosion, costly painting dispensed with, architectural effectiveness and beauty of design. Under the patents of Messrs. Wayss & Freytag, contractors of Neustadt, Germany, this company also carry out concrete conduits for electric cables; such conduits are now exclusively adopted by the Imperial German Postal Authorities.

COX & YEMAN.

Messrs. Cox & Yeman, of 184, Brompton Road, S.W., exhibited at the Building Trades' Exhibition a very fine piece of oak wall-panelling, with chimney-piece and billiard-table, adapted from the original in the Victoria and Albert Museum from Bromley House, dated 1606. This at once showed that the firm are capable of executing work of the highest character, both as regards design and workmanship.

DAVIS & BENNETT.

Messrs. Davis & Bennett, of the Westminster Sanitary Works, Princes Mews, Great George Street, S.W., have a number of interesting specialities. One of these is a porcelain bath fitted with a copper sparge pipe over the rim, and a specially-arranged outlet. The chief features of the former are that the water issues all round the bath and thus washes the sides, at the same time warming the porcelain and so rendering it more agreeable to the bather. This bath, though fitted with 2in. waste pipe only, empties away rapidly and quietly. As regards water-closets, the firm manufacture all varieties, including one with an automatic seat action which starts the flush when the pressure on the seat is removed. Messrs. Davis & Bennett have executed work in a great number of large town and country houses, at leading clubs, and at many well-known hotels, theatres, hospitals, and factories.

New Companies.

Liverpool Academy of Arts (founded 1810, incorporated 1901).

Registered April 11th with fifty members, each liable for £1 1s. in the event of winding up, to promote art by the holding of exhibitions and schools, or otherwise. The management is vested in a council.

Armoured Concrete Construction Co., Ltd.

Registered April 12th to carry on the business of cement manufacturers and merchants, manufacturers of armoured and ordinary concrete, contractors, engineers, builders, &c. Capital £5,000 in £1 shares. The first directors are A. Johnston, F. Candy and H. C. Werner (managing director and secretary).

Thurmaston Brick Co., Ltd.

Registered April 16th to acquire and carry on the business of brick manufacturers heretofore carried on by Birkinshaw & Co., at Thurmaston, as the Thurmaston Brick Company. Capital £15,000 in £1 shares. The first directors are T. H. Heward, A. Barron and J. T. Bambury. Registered office: 68A, Humberton Gate. Leicester.

Bell's Synthetic Building Materials Co., Ltd.

Registered April 16th to acquire from H. Bell English patents Nos. 22,302 and 22,303 of 1900, to acquire any other patents, inventions, and rights, and to carry on the business of builders, contractors, timber merchants, engineers, dealers in building materials, &c. Capital £12,000 in £1 shares. The first directors are E. H. Bell, T. Frost and J. T. Szek. Registered office: 195, Hammersmith Road, W.

Moreton Brick and Tile Co., Ltd.

Registered April 17th to acquire lands buildings and hereditaments at or near Moreton, in the parish of Bidstone, or elsewhere, in the county of Chester, and to carry on the business of brick, tile, pipe, tube, chimney pot, sink, gully, trough, and cement manufacturers, clayworkers, &c. Capital £10,000 in £1 shares.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
May 3	Goldhanger, near Maldon, Essex—Bridge	County Council	P. J. Sheldon, County Offices, Chelmsford.
„ 3	Newbold—Central Hall	School Board	W. Glossop, Cavendish Street, Chesterfield.
„ 3	Atherstone—Pulling down and re-building	Phillips & Marriott, Ltd.	H. W. Chattaway, Architect, Trinity Churchyard, Coventry.
„ 3	Auchterless, Scotland—Additions		J. Duncan & Son, Architects, Turriff.
„ 3	Consett, Durham—Cottages, &c.	Iron Co., Ltd.	C. E. Oliver, General Offices, Consett.
„ 3	London, W.—Classrooms, &c.	Kensington & Chelsea School District	C. Sharpe, 11 Old Queen Street, S.W.
„ 3	Wigston—Stables	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
„ 3	Bromley, Kent—New Wards	Joint Hospital Board	J. Ladds, 7 Doughty Street, Mecklenburgh Square, W.C.
„ 4	Leicester—Roofing, &c.	Markets Committee	E. G. Mawbey, Town Hall, Leicester.
„ 4	Percy Main, near Newcastle-on-Tyne—Church		J. Grant, 48 Blyth Street, Percy Main.
„ 4	Shotton Colliery, Durham—Cottages		Shotton Colliery Offices, Durham.
„ 4	Ballynafeigh, Ireland—Additions	Committee of the Edgar Home	Hunter, Scottish Provident Buildings, Belfast.
„ 4	Blackburn—Coal Shed, &c.	Guardians	F. C. Ruddle, Union Offices, Cardwell Place, Blackburn.
„ 4	Bury, Lancs.—Schools	Governors	W. J. Watts & Son, 40, South King Street, Manchester.
„ 4	Clitheroe—Bridge	Bowland Rural District Council	Clerks Office, 21 Church Street, Clitheroe.
„ 4	Castlecor, near Kanturk	Castlecor Dairy Co., Ltd.	Manager's Office, Castlecor.
„ 4	Aber-Bargoed—Two Villas	Powell-Duffryn Steam Coal Co., Ltd.	Architect's Office, Bryn-Awel, Hengoed, Maesycwmmer.
„ 4	Sheffield—Grand Stand	Cricket and Football Club, Ltd.	A. Leitch, 40, St. Enoch Square, Glasgow.
„ 6	Fordingbridge, Wilts—Strengthening Bridge	County Council	W. J. Taylor, The Castle, Winchester.
„ 6	Shanklin—two Groynes, &c.	Urban District Council	Council Chambers, Victoria Avenue, Shanklin.
„ 6	Gelli, Rhondda Valley—Baptist Chapel	Building Committee	W. D. Morgan, 5 Baily Street, Ton, Pentre, R.S.O.
„ 6	Langarth, Truro—Farm House		S. Hill, Architect, Redruth.
„ 6	London, E.C.—Alterations and Additions	Finsbury Borough Council	Borough Surveyor's Office, Town Hall, Rosebury Avenue, E.C.
„ 6	Nottingham—Tramway Depot	City Council	A. Brown, City Engineer, Guildhall, Nottingham.
„ 6	Penrith—Bridge	Rural District Council	J. W. Smith, Clerk, St. Andrew's Square, Penrith.
„ 6	Leeds—Concreting	Corporation	City Engineer's Office, Municipal Buildings, Leeds.
„ 6	Salterhebbe, Yorks—Houses		J. F. Walsh & Nicholas, Lancs. and Yorks. Bank Chambers, Halifax.
„ 7	Manchester—Mill	Lancs. and Yorks. Railway Co.	Engineeer's Office, Hunt's Bank, Manchester.
„ 7	Newton, Rigg, Penrith—Farm Buildings, &c.	County Councils of Cumb. & Westmorland	G. D. Oliver, County Architect.
„ 7	West Ham—Works	School Board	W. Jacques, 2 Fen Court, E.C.
„ 7	Wincanton—Alterations, &c.	Guardians	A. G. Pictor, Architect, Bruton.
„ 7	Orford—Methodist Chapel		H. Winkworth, 3A Hatton Court, Ipswich.
„ 7	London, N.—Wall, &c.	Tottenham Urban District Council	W. H. Prescott, 712 High Road, Tottenham.
„ 8	Minster—Convent old Buildings	Guardians	Architect, Board Room Minster, near Ramsgate.
„ 8	Margate, Kent—Builders' Material	Metropolitan Asylum Board	Board Offices, Embankment, London, E.C.
„ 9	Hoylake, Cheshire—Lavatory Fittings	Urban District Council	T. Foster, District Council Offices, Hoylake.
„ 9	Ludlow—Buildings	Corporation	J. Parker, 14 Nelson Street, Hereford.
„ 9	Chelmsford, Essex—Additions, &c.	Standing Joint Committee	F. Whitmore, Duke Street, Chelmsford.
„ 10	Bradford—Villa		J. F. Walsh & G. Nicholas, Lancs. and Yorks. Bank Chambers, Halifax.
„ 10	Oswestry—Rebuilding	Standing Joint Committee	A. T. Davis, County Surveyor, Shirehall, Shrewsbury.
„ 11	Lichfield—School	Governors	H. Smith, 111 Finsbury Pavement, London, E.C.
„ 11	Uxbridge—Wall, &c.	Burial Board	W. L. Ives, 54 High Street, Uxbridge.
„ 13	East Grinstead—Workmen's Dwellings	Urban District Council	R. Wilds, Urban Council Offices, East Grinstead.
„ 13	Kirkcaldy—Tramways, &c.	Corporation	W. L. Macindoe, Town Clerk's Office, Kirkcaldy.
„ 13	Bishop's Stortford—Board School, &c.	Gas Co., Ltd.	Manager's Office, Gas Works, Bishop's Stortford.
„ 14	Abingdon - School Buildings	School Board	F. Morland, 33 Bath Street, Abingdon.
„ 14	London, E.C.—Slates, &c.	Great Eastern Railway Co.	Secretary's Office, Liverpool Street Terminus, E.C.
„ 15	Edgware, Middlesex—Alterations	Guardians	F. G. Seabrook, Union Offices, Edgware.
„ 16	Netherwitten—Cloak Room, &c.	School Board	School House, Netherwitten.
„ 17	Southwark Park—Conveniences, &c.		Architect's Department, County Hall, Spring Gardens, S.W.
„ 18	Luton—Homes	Guardians	B. B. Franklin, 21 Market Hill, Luton.
„ 20	Sedgley—Extensions	School Board	A. Ramsell, 187 Wolverhampton Street, Dudley.
„ 22	Leeds—Market Hill, &c.	Market Committee	Leeming & Leeming, Town Hall, Leeds.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ENGINEERING:		
May	3	Swansea—Wiring, &c.	Corporation	J. Thomas, Town Clerk, Guildhall, Swansea.
"	3	High Wycombe—Railway	G.W. and G.C.R. Joint Committee	Engineer's Office (G.W.R.), Paddington Station.
"	4	Coldstream, Berwickshire—Waterworks	Town Council	J. Scott, Town Clerk, Coldstream.
"	4	Workington—Embankments, &c.	Corporation	J. Bentley, 7 Lowther Street, Kendal.
"	4	Uttoxeter—Boiler	Gasworks, Ltd.	W. Murray, Manager, Uttoxeter.
"	6	Shanklin, Isle of Wight—Groynes	Urban District Council	Council Chambers, Victoria Avenue, Shanklin.
"	7	Huncoat, near Accrington—Widening Railway, &c.	Lancs. & Yorks. Railway Company	Engineer's Office, Hunt's Bank, Manchester.
"	7	Manchester—Plant, &c.	Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester.
"	8	Sandown, Isle of Wight—Pier Work	Pier Extension Co., Ltd.	T. R. Saunders, Belgrave Chambers, Ventnor, Isle of Wight.
"	10	Baddesley, Ensor, nr. Atherstone—Waterworks	——	Willcox & Raikes, 63 Temple Row, Birmingham.
"	10	Madrid—Telephone System	Spanish Post Office	Commercial Department, Foreign Office, Madrid.
"	13	Clevedon, Somerset—Pumping Machinery	Water Company	J. Mansergh, 5 Victoria Street, Westminster.
"	13	Kirkcaldy—Tramways	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
"	13	Armagh—Water Supply	Committee	Dorman, Court House, Armagh.
"	14	London, S.W.—Wiring	Battersea Borough Council	W. M. Wilkins, Municipal Buildings, 1 Lavender Hill, S.W.
"	15	Chapel-en-la-Frith—Waterworks	Rural District Council	Sterling & Swann, Town Hall, Chapel-en-le-Frith.
"	15	Edgware, Middlesex—Machinery	Guardians	F. J. Seabrook, Union Offices, Edgware.
"	18	Motherwell, Scotland—Lamp Columns, &c.	Electric Lighting Committee	J. Burns, Town Clerk, Motherwell.
"	18	Briton Ferry, Glamorgan—Removal of Lock	Neath Harbour Commissioners	Harbour Offices, Briton, Ferry.
"	20	Ludlow—Machinery and Plant	Corporation	J. H. Williams, Town Hall, Ludlow.
"	24	Corunna—Tramway Concession	Spanish Ministry of Agriculture	Commercial Department, Foreign Office Corunna.
"	25	Carlisle—Waterworks	Corporation	C. B. Newton, Engineer, Victoria Viaduct, Carlisle.
"	30	Tonbridge, Kent—Plant	Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
June	3	Madrid—Tramways	Spanish Government	Commercial Department, Foreign Office, Madrid.
"	8	St. Petersburg—Embankment	——	St. Petersburg Town Council (Stadtamt).
"	25	Cairo—Engines, &c.	——	Inspector-General of Irrigation, Upper Egypt, Cairo.
Dec.	10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.
		IRON AND STEEL:		
May	4	Newcastle-on-Tyne—Nails, Chains &c.	Tyne Improvement Commissioners	Commissioners' Engineer, Berwick Street, Newcastle on-Tyne.
"	6	Brentwood, Essex—Pipes	Gas, Coke and Light Co., Ltd.	C. A. Fielder, Secretary, Brentwood
"	6	Halifax—Ventilators	School Board	W. H. Ostler, Clerk, Union Street, Halifax.
"	7	Bradford—Iron Castings, &c.	Cleansing Committee	McTaggart, Hammerton Street Depôt, Bradford.
"	8	London, E.C.—Carriage & Waggon Materials	Madras Railway Company	Company's Offices.
"	10	Shrewsbury—Girders	Joint Com. of L. & N.W. & G.W.R. Co.'s	Joint Engineer, Woodside Station, Birkenhead.
"	13	Guildford—Pipes	Town Council	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford.
"	13	South Lancashire—Rails, &c.	Electric Traction and Power Co., Ltd.	Kincaid, Waller & Menville, 29 Great George Street, Westminster.
"	14	London, E.C.—Iron and Pipes, &c.	Great Eastern Railway Company	Secretary's Office, Liverpool Street Terminus, E.C.
July	1	Calcutta—Bins	Corporation	Chairman of Corporation, Calcutta.
		PAINTING AND PLUMBING:		
May	4	Newcastle-on-Tyne—Varnishes and Paints	Tyne Improvement Commissioners	Commissioners' Engineer, Berwick Street, Newcastle-on-Tyne.
"	6	Manchester—Painting	Sanitary Committee	City Surveyor's Office, Town Hall, Manchester.
"	7	Bradford—Oils, &c.	Cleansing Committee	McTaggart, Hammerton Street Depôt, Bradford.
"	11	Dewsbury—Colouring and Painting	Corporation	Borough Surveyors' Office, Town Hall, Dewsbury.
"	15	London, S.E.—Painting	Guardians of Lambeth	Guardians' Office, Brook Street, Kennington Road, S.E.
"	15	West Norwood—Painting	Guardians	W. Thurnall, Guardian's Brd Room, Brook St., Kennington Rd., S.E.
Aug.	5	Cleckheaton Interior Renovation of Church	——	Wesleyan Church, Whitcliffe Road, Cleckheaton.
		ROADS AND CARTAGE:		
May	3	Chesterfield—Materials	Rural District Council	T. J. Robinson, Surveyor, Hasland, Chesterfield.
"	3	Ashford, Kent—Road Metal	Urban District Council	W. Terrill, North Street, Ashford, Kent.
"	3	Hartlepool—Road Metals, &c.	Rural District Council	W. Burton, Road Surveyor, Billingham.
"	4	Alvaston, Derby—Street Completion	Urban District Council	C. Greatorex, Council Offices, Alvaston.
"	4	Carrickfergus, Ireland—Stones	Urban Council	Council, Town Hall, Carrickfergus.
"	4	Windsor—Gravel	Council	E. A. Stickland, Borough Surveyor, Alma Road, Windsor.
"	4	Stafford—Carting	Rural District Council	W. Morgan, 5 Martin Street, Stafford.
"	6	Crewe—Street Works	Town Council	G. Eaton-Shore, Earle Street, Crewe.
"	6	London N.—Road Works	Hornsey Urban District Council	E. J. Lovegrove, 99 Southwood Lane, Highgate.
"	6	Barrhead, Scotland—Causewaying	Town Council	C. E. Wardlaw, 112 Bath Street, Glasgow.
"	6	Goole, Yorks—Material	Urban District Council	L. J. Veit, Surveyor, Council Offices, Chapel Street, Goole.
"	6	London, N.—Paving	Works Committee	Borough Engineer, Town Hall, London, N.
"	6	Ripon—Whinstone	Corporation	City Surveyor, Ripon.
"	6	Southwick, Sussex—Flints	Urban District Council	G. W. Warr, Surveyor, Council Offices, Southwick.
"	6	Winchester—Flints	County Council	W. J. Taylor, County Surveyor, The Castle, Winchester.
"	7	Brentford—Granite	Urban District Council	N. Parr, Clifden House, Boston Road, Brentford.
"	7	Southgate—Broken Granite	Urban District Council	C. G. Lawson, Council's Surveyor, Palmer's Green, N.
"	8	Richmond, Surrey—Paving	——	J. H. Brierley, Borough Surveyor, Town Hall, Richmond.
"	8	Hammersmith—Paving	Borough Council	H. Mair, Borough Surveyor, Hammersmith.
"	9	Brighton—Granite Kerb	County Borough	F. J. C. May, Town Hall, Brighton.
"	9	Stafford—Granite, &c.	Rural District Council	W. Morgan, 4 Martin Street, Stafford.
"	9	Plumstead—Paving	Woolwich Borough Council	F. Sumner, Council's Office, Maxey Road, Plumstead.
"	10	Sunderland—Road Material	Rural District Council	T. Young, Council Office, Sunderland.
"	13	Hindley, Leeds—Street Works	Urban District Council	A. Holden, Council Offices, Cross Street, Hindley.
"	18	Norwich—Street Works	——	A. E. Collins, City Engineer, Guildhall, Norwich.
"	22	Barnes—Roads	——	F. & W. Stocker, 90 & 91 Queen Street, Cheapside, E.C.
"	29	Havana—Sewering and Paving	Military Governor	Commercial Department, Foreign Office, Havana.
		SANITARY:		
May	3	Richmond, Surrey—Sewer	Town Council	J. H. Brierley, Town Hall, Richmond.
"	6	Botley, Hants—Drainage	——	W. J. Taylor, The Castle, Winchester.
"	7	London, N.—Dust Collection, &c.	Tottenham Urban District Council	E. Crowne, 712 High Road, Tottenham.
"	7	Richmond—Lime, &c.	Main Sewerage Board	W. Fairley, Kew Gardens.
"	7	Bradford—Portland Cement, Lime, &c.	Cleansing Committee	McTaggart, Hammerton Street Depôt, Bradford.
"	14	Ilfracombe—Sewers, &c.	Urban District Council	Engineer and Surveyor, Town Hall, Ilfracombe.
"	15	Morecambe—Sewerage Works	Urban District Council	Engineer's Office, 11 Cedar Street, Morecambe.
		TIMBER:		
May	4	Newcastle-on-Tyne	Tyne Improvement Commissioners	Commissioners' Engineer, Bewick Street, Newcastle-on-Tyne.
"	7	Tredegar, Mon.—Timber, &c.	Guardians	J. A. Shepard, Town Hall, The Circle, Tredegar.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
May	17	Hereford—Alterations of Workhouse Buildings	25 guineas each.	T. Llanwarne, St. John Street, Hereford.
"	27	Aldershot—Schools	——	N. Clinton, Clerk to the Board, Station Road, Aldershot.
June	8	Buxton—Water Pump	£20, £10, and £5 respectively.	W. H. Grieves, Town Surveyor, Town Hall, Buxton.
"	10	Ennis, co. Clare—Additions, &c. to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
"	24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100 respectively	W. H. Talbot, Town Clerk, Town Hall, Manchester.
"	24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
"	30	Hereford—Municipal Buildings	£100, £75, £50	J. Carless, Offa Street, Hereford.
July	31	Manchester—Fire Station and Police Station	£300, £200 and £100 respectively	W. H. Talbot, Town Hall, Manchester.
No date		Gillingham—School	£10, £5	E. T. Atchison, 28 Waterloo Road, New Brompton.
"		Darlington—Row of Shops and Dwelling Houses	——	Borough Surveyor, Town Hall, Darlington.
"		Salford—Machinery	£50	Borough Engineer, Town Hall, Salford.

CURRENT PRICES.

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ..	per cwt.	1 2 2	1 12 1
Colza Oil, English ..	do.	1 9 0	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 4 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do.	1 0 4½	—
Linseed Oil, barrels ..	do.	1 8 0	—
Petroleum, American ..	per gal.	0 0 6⅝	0 0 6⅞
Do. Russian ..	do.	0 0 6⅝	0 0 6¼
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	2 18 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 5 0	1 6 6
Tar, Stockholm	per barrel	1 8 0	—
Turpentine	per cwt.	1 7 9	—

METALS.

Copper, sheet, strong ..	do.	85 0 0	—
Iron, Staffs., bar ..	per ton	6 0 0	9 10 0
Do. Galvanised Corrugated sheet ..	do.	11 0 0	—
Lead, pig, Spanish ..	do.	12 5 0	—
Do. do. English common brands	do.	12 17 6	—
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17 9 0	—
Do. pipe	do.	18 3 0	—
Nails, cut clasp, 3in. to 6in.	do.	12 0 0	13 0 0
Do. floor brads	do.	11 15 0	12 15 0
Steel, Staffs., Girders and Angles	do.	6 0 0	6 5 0
Do. Mild Bars	do.	7 0 0	7 10 0
Tin, Foreign	do.	118 0 0	118 10 0
Do. English ingots ..	do.	121 0 0	—
Zinc, sheets, Silesian ..	do.	20 10 0	—
Do. do. Vieille Montaigne	do.	21 0 0	—
Do. Spelter	do.	17 0 0	17 12 6

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel ..	per load	3 0 0	4 0 0
Pine, Quebec Yellow ..	do.	4 7 6	6 0 0
Do. Pitch	do.	2 10 0	2 15 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 0
Do. Petersburg ..	per bundle	0 0 9	0 0 10½
Deals, Archangel 2nd & 1st	per P.Std.	9 10 0	12 10 0
Do. do. 4th & 3rd	do.	11 15 0	13 5 0
Do. do. unsorted	do.	—	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	14 15 0	15 5 0
Do. do. 2nd „	do.	8 15 0	14 15 0
Deals, Petersburg, unsorted, Yellow	per P. Std. ..	5 5 0	13 0 0
Do. do. White	do.	9 10 0	11 5 0
Do. Swedish	do.	9 10 0	16 0 0
Do. White Sea ..	do.	9 15 0	13 0 0
Do. Quebec Pine, 1st ..	do.	22 0 0	23 0 0
Do. do. 2nd ..	do.	19 15 0	—
Do. do. 3rd &c.	do.	13 10 0	—
Do. Canadian Spruce, 1st	do.	12 5 0	12 15 0
Do. do. 3rd & 2nd	do.	9 5 0	10 0 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds ..	do.	6 10 0	9 15 0
Flooring Boards, 1in. prepared, 1st ..	per square	0 12 0	0 13 0
Do. 2nd ..	do.	0 9 6	—
Do. 3rd &c. ..	do.	0 7 9	0 10 6

COMING EVENTS.

Wednesday, May 1.

SOCIETY OF ARTS.—Mr. Arnold F. Hills on the "Thames Steamboat Service," 8 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Annual General Meeting. Mr. T. Cato Worsfold on "The Porta Nigra a Treasure of Treves," 4.30 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual Business Meeting and Presidential Valedictory. Addressed by Mr. Henry F. Kerr, A.R.I.B.A.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Ordinary Meeting at 8 p.m.

ROYAL ARCHÆOLOGICAL INSTITUTE.—Mr. A. R. Whiteway, M.A., on "The Pyrenean Neighbour, or the Vicinal System in the Western Pyrenees." Mr. H. Longden on "Cast Iron," 4 p.m.

Thursday, May 2.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

SOCIETY FOR THE PROMOTION OF HELLENIC STUDIES.—Meeting at 5 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Mrs. Ernest Hart on "Stencil Painting as an Art."

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—Mr. A. H. Allen, A.M.I.E.E., on 'The Storage of Electricity," 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Messrs. C. G. Lamb, M.A., B.Sc., and Miles Walker, B.A., on "An Instrument for Measuring the Permeability of Iron and Steel," and Mr. Frank Holden on "A Watt-Hour Meter," 8 p.m.

CARPENTERS' COMPANY (Lectures on Carpentry and Joinery at Carpenters' Hall, London Wall, E.C.).—Mr. James Bartlett on "Timber Framing," 7.30 p.m.

Friday, May 3.

SOCIETY OF ARTS (Howard Lecture).—Mr. Alfred C. Eborall, M.I.E.E., on "Polyphase Electric Working," 8 p.m.

INSTITUTION OF JUNIOR ENGINEERS.—Mr. William Powrie on "Employer and Employed," 8 p.m.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. E. Greenop on "Professional Advertising," 7 p.m.

Saturday, May 4.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS (meeting at Carpenters' Hall, E.C.).—Mr. W. J. Collins on "Trade Training in the Future," 6 p.m.

EDINBURGH ARCHITECTURAL SOCIETY.—Geological Ramble in Queen's Park.

ARCHITECTURAL ASSOCIATION.—Visit to Newgate Gaol at 3 p.m.

ROYAL INSTITUTION.—Mr. J. Y. Buchanan on "Climate: Its Causes and Effects," 3 p.m.

Monday, May 6.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Annual General Meeting at 8 p.m.

LIVERPOOL ARCHITECTURAL ASSOCIATION.—Closing Address by the President, Professor Simpson.

SOCIETY OF ENGINEERS.—Meeting at 7.30 p.m.

Tuesday, May 7.

GLASGOW ARCHITECTURAL ASSOCIATION.—Symposium: "Registration of Architects."

Wednesday, May 8.

IRON AND STEEL INSTITUTE.—Annual Meeting at the Institution of Civil Engineers, Great George Street.

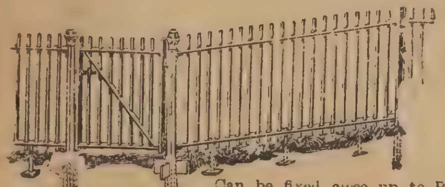
GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BAMBURY, OXON.—For additions and alterations to factory, Britannia Road, for Messrs. W. F. Lucas & Co. Mr. Herbert Quinton, architect, 22 George Street, Oxford. Quantities by the architect:—

Benfield & Loxley	£1,497
W. J. Bloxham	1,477
J. Wooldridge	1,463
J. S. Kimberley	1,401
Kingerlee & Sons	1,395



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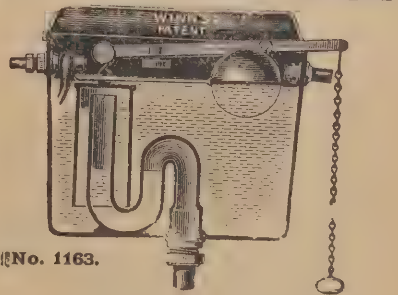

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W. Kennedy, Partick	6,782	17	8
J. & J. Neilson, Muirhead, Chryston	5,864	18	9
A Duncan, 64 Westmoreland Street, Glasgow	5,768	14	2
A. A. R. Lang, Whinstone Quarries, Gourock	5,596	18	10
C. McAndrew, 12 New Road, Ayr	5,574	5	10
W. Wilson, Kilsyth	5,406	4	0
A. Stark & Sons,* 75 St. George's Place, Glasgow	5,395	7	10
A. Looh,† 9 Shandwick Place, Edinburgh	5,258	3	1

* Accepted. † Withdrawn.

NOTE.—The first tender was for granite, all the others were for whinstone.

EASINGWOLD (YORKS).—For (Contract A) the providing and laying of about 21,324 yards of 5in., 12,462 yards of 4in., and 16,343 yards of 3in. water-mains, together with bends and branches valves, hydrants, wash-outs, and consumers' service pipes, &c., in their district, for the Easingwold Rural District Council. Messrs. Fairbank & Son, C.E., engineers, 13 Lendal, York:—

S. Saunders, Earl's Court Square, London	£24,497
W. & J. Foster, West Hartlepool	20,840
Harrison & Barraclough, Brighouse	17,704
J. Bentley, Bradford	15,429
Parker & Sharpe, York	15,651
W. Doleman, Dewsbury	14,200
Morley Bros., Keighley	14,142
Ridley & Sons, Middlesborough	14,064
Jowett Bros., Burscough	13,838
R. W. Barker, Lowther Arcade, Harrogate	13,801
F. U. Simpson, Burton Leonard	13,102
C. Firth,* Scarborough	13,186

* Accepted.

LONDON.—For the erection of shop premises at Barking, E. Messrs. Foulsham & Herbert Riches, architects, 3 Crooked Lane, King William Street, E.C., and Bromley-by-Bow, E. Quantities supplied:—

C. Dearing & Son	£2,037	F. & T. Thorne	£1,895
Sheffield Bros.	1,941	Courtney & Fairbairn	1,853
T. Osborn & Sons	1,905	G. E. Todd & Co.*	1,839

* Accepted.

LONDON, W.C.—For works of scavenging, removal of dust, and street watering and cleansing within so much of the borough as was formerly within the Holborn district, for the Works and General Purposes Committee of the Holborn Borough Council:—

Dust contract, slop contract (including all labour), watering contract.

H. Covington, Battersea	£7,920
W. Clarkson, Vauxhall	7,895
H. Crane, Kingsland	7,860
H. Boyer, Paddington Basin	7,710
Boyer & Son, Paddington	7,700
J. Walker, Camden Town	7,695
G. Cookson,* Vauxhall	7,250
C. Fardell, Fishmongers' Hall Street, E.C.	5,910

Dust contract, lop contract without scavenging, watering contract.

H. Crane	£7,185	Boyer & Son	£7,040
H. Covington	7,185	J. Walker	6,900
W. Clarkson	7,170	G. Cookson	6,400
H. Boyer	7,075	C. Fardell	5,910

* Accepted.

MANSFIELD.—For the erection of five shops, stabling, and other premises in Leeming Street, Mansfield, for the Mansfield Brewery Company. Messrs. Vallance & Westwick, architects, Mansfield:—

J. H. Vickers, Lenton Boulevard, Nottingham	£2,900
J. F. Price, Nottingham	2,858
Hutchinson & Son, Nottingham	2,775
Vallace & Blythe	2,739
J. Greenwood	2,709
C. G. Percival	2,660
C. Vallance*	2,630

* Accepted.

WEALDSTONE (HARROW).—For the erection of a set of schools at Wealdstone. Harrow, to accommodate about 800 children, for the Harrow United District School Board. Messrs. Houston & Houston, architects, 5 York Buildings, Adelphi, W.C.:—

R. L. Tonge, Watford	£16,000
Foster Bros., Norwood, S.E.	15,967
J. Almond & Son, Ponder's End, N.	15,700
C. G. Hill, Coventry and London	15,499
Y. J. Lovell, Marlow, Bucks	15,432
Cowley & Drake, Willesden	15,404
J. Chessum & Sons, Bow, E.	15,112
Martin, Wells & Co., Vauxhall	15,100
C. Simmons, Willesden Junction	14,806
T. Turner, Ltd., Watford	14,793
C. Brightman, Watford	14,590
J. Smith & Son, Norwood, S.E.	14,583
W. Tout, Hendon	14,538
F. Gough & Co., Hendon	14,524
W. Lawrence & Son, Waltham Cross	14,390
F. J. Chinchen, Kensal Green	14,200
A. J. Bachelor,* Harrow	13,400
J. Cracknell, Peterborough	13,176

* Accepted conditionally.

WEST BRIDGFORD (NOTTS).—For two-cell destructor, &c. and buildings, for the West Bridford Urban District Council. Mr. Wm. Pare, C.E., surveyor:—

Destructor, &c.

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Meldrum Bros., Manchester	£4,106	0	0
Hughes & Stirling, Bootle	3,172	0	0
Manlove & Alliott (alternate scheme)	2,667	10	0
Heenan & Froude, Manchester	2,615	0	0
Horsfall Company, Leeds	2,562	0	0
Manlove & Alliott, Nottingham	2,175	0	0
W. Musker, Bootle	1,995	0	0
Goddard, Massey & Warner (alternate scheme)*	1,983	11	0
Goddard, Massey and Warner, Nottingham	1,903	11	0
Meldrum Bros. (alternate scheme)	1,375	0	0

Building to contain destructor cells, tall chimney, stabling, cart-sheds, cottages, &c.

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Dennett & Ingle, Nottingham	6,494	0	0
Bower Bros., Halifax	6,289	0	0
J. H. Vickers, Nottingham	5,870	14	3
W. Savage, Nottingham	5,639	0	0
J. Lewin, Netherfield	5,300	0	0
W. Maule, Nottingham	5,286	0	0
T. Cuthbert, Nottingham	5,257	0	0
J. Cooper & Son,* Nottingham	5,206	0	0

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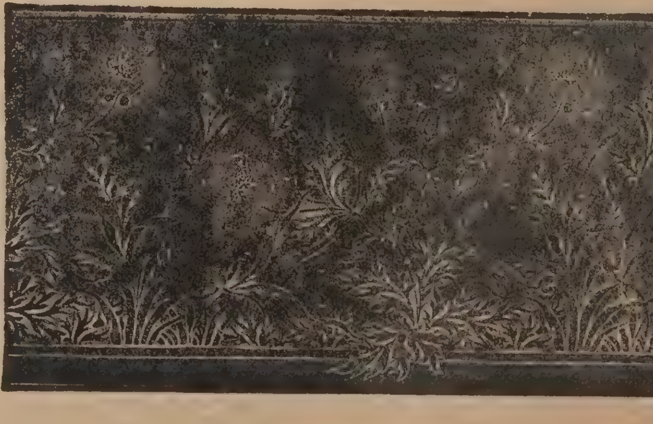

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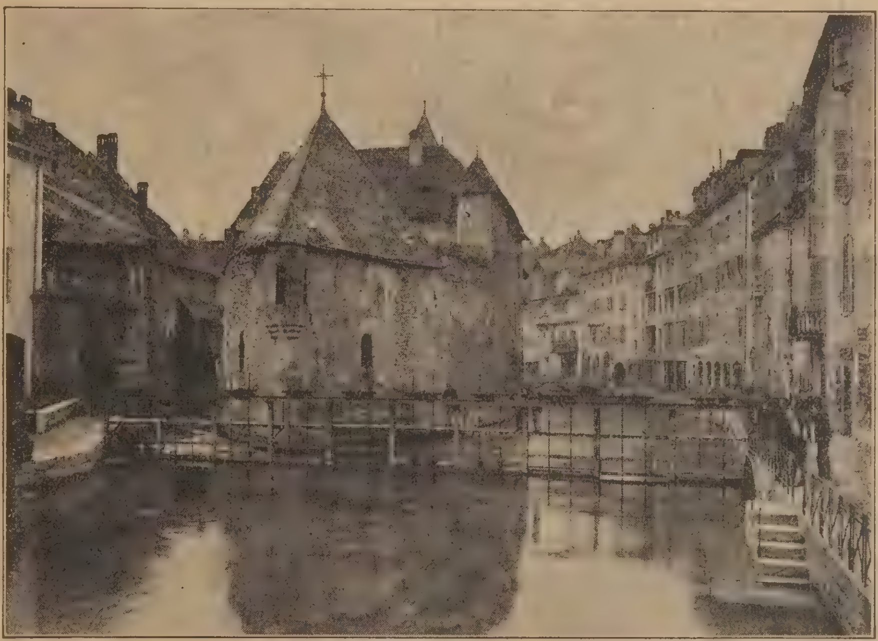
THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

MAY 8, 1901.
No. CCCXXVI.

EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

An Architectural Causerie.

Architecture at the Royal Academy. There is perhaps no other institution in this country which is so severely criticised as the Royal Academy. Those who are responsible for its management naturally attempt to vindicate its aims and methods, while those who have formed the conviction that the whole exhibition is a farce, groan out their pessimisms year after year, till we sicken to death of them. Some of these critics chiefly occupy themselves with comparisons between present and former exhibitions, always to the detriment of the present; others, imbued with the spirit of the Beaux-Arts and Montmatre, taunt us with generalities, and hold the gods of Paris before our eyes as *dii majorum gentium.* On the first Monday in May the public flocks in. The "superior" portion goes into raptures which are as artificial as the feverish exclamations of Mark Twain's pilgrims; the "ordinary people" are drawn by the pretty and the sentimental; but there is a residue of persons who can and do appreciate, who always find much to enjoy in every Academy, even though the "higher criticism" be hostile and very depressing. Whatever may be the opinion of the pictures at this year's Exhibition, we think all will agree that the Architectural Room is most disappointing; but we do not say this as the prelude to a dirge. There is a great deal that is mediocre, little, perhaps, that is really bad, but if this selection of 166 drawings—fewer than usual—is the best of the hundreds that were submitted, we are indeed sorry for the authors of the rejected drawings. Without a doubt the domestic work shown is by far the most pleasing, and some of the houses are delightfully conceived. One of the most interesting of these is the house at St. Albans, Hertfordshire, by Messrs. Cox & Silk (1642). The design savours of the old houses of the Cotswolds and is exceedingly neat in treatment; grey slates are used for the roof, with red chimneys, and though no plan is given, the main internal arrangements are, as they should be, manifest by the exterior. Two gabled wings jut out from the main building, in the centre of which is the entrance, while outbuildings are attached at each side, the whole effect being very quiet and restrained. "Glebelands," Wokingham, by Mr. Ernest Newton (1578), is another pleasing example of domestic architecture. The gables, slightly rounded at the top, are very characteristic. Mr. Newton's house at Chislehurst (1573) is not anything like so good. Mr. George H. Stevenson exhibits the "Cock" tavern at Kingsthorpe (1624). This tavern, with its steep roofs and quaint windows, has an old-world aspect, and, strange to say, does not need huge cut-glass lamps, decorated glass-panelled doors, and carved walnut fittings to make it beautiful. In the new house at Ascot Heath (1528) Mr. Leonard Stokes shows a clever arrangement of a verandah and conservatory, which are treated as integral portions of the design (the drawing, by the way, is in the style of Mr. Mallows, the method of putting in the close-cut hedges being especially familiar). Mr. Walter H. Brierley exhibits two drawings of Welburn Hall, Yorks. (1576 and 1613), which he has remodelled and added to, a loggia being very effectively treated. Some excellent etchings by Fred. Slocombe are shown of the house near Piccadilly by Mr. C. J. Harold Cooper (1591–1596 and 1597). Figures of children are introduced into the stair balustrade, but we would suggest that the two female figures at either side of the dining-room chimney-piece are altogether out of scale—being too large—the same remark applying to the figures in the frieze above. Oak panelling is used throughout this house, and the staircase leads down to the hall in the "grand" manner. Mr. James Strong's golf club-house at Forby (1645) and Mr. Arthur Stratton's "House on the Thames" (1598) are both above the average, a feature of the latter being a long verandah with gallery over. The absence of large sheets of plate glass is specially noticeable in all the houses mentioned, the windows being characterised by strong mullions and small panes, which are much more satisfactory in appearance. There are no private houses by Messrs. Brewill & Baily (who, however, show the Infants' School at Cresswell, Derbyshire, No. 1537, a clever piece of work), and Messrs. Bateman & Bateman have designed much better houses than that at Barnet Green, Worcestershire (1640). Mr. Arnold Mitchell also does not improve his reputation by the house at Bowden Green, Pangbourne (1631), and one was not particularly pleased with St. Aidan's Vicarage, Leeds, by Messrs. Bedford & Kitson (1636). We miss the work of Messrs. Niven & Wigglesworth. In concluding the notice of domestic work we may mention the view in the salon of the Château Mauricien, Wimereux, by Mr. Belcher (1599), a beautiful coloured drawing of work academic in character and very French in feeling; Mr. Bodley's "Hayes Lodge," Morley, Derbyshire (1647); "The Birchmoor Lodge," Woburn (1580), by Mr. H. Percy Adams; and a house at Matlock Bath, by Mr. T. Raffles Davison (1533). Mr. Basil Champneys' "House at Heathfield, Sussex" (1558), is not improved by the uneven treatment at the top of the bays, and "Huntercombe Manor," by Mr. Andrew J. Gordon (1678), looks as little like an Oxfordshire house as a French château would.


CHATEAU DE L'ILE, ANNECY. (See page 263.)

Coming now to municipal and business buildings, we find many competitive designs in the Architectural Room. Mr. Runtz exhibits a sketch design for the exterior of the new Gaiety Theatre and "Morning Post" offices (1560), and his Strand Improvement Scheme, as portrayed by Mr. Raffles Davison (1559); with regard to the latter, it is amusing to notice the ingenuity of the draughtsman, who, to show the buildings to best advantage, has conveniently omitted the church of St. Mary-le-Strand, allowing plenty of room for the royal carriage and troop of Lancers to pass by, and for the crowd on the pavement, which is, apparently, about 25ft. wide—very cunning this! Then there are the Swansea Dock Offices, Belfast Assembly Hall, the new Sessions House, Walsall Municipal Buildings, Blackburn Police Courts, the Cartwright Memorial Hall at Bradford and others—all more or less of interest, though generally less. Mr. Collcutt shows us again Lloyd's Register of Shipping (1563), and Mr. Aston Webb the sick-quarters for the Britannia Royal Naval College, Dartmouth (1620), and a detail of one bay of the Victoria and Albert Museum (1616), with Donatello and Qtn. Matsys under canopies. The new buildings for the University of Cambridge, by Mr. T. G. Jackson (1568), are very scholarly. They comprise the Sedgwick Memorial Museum of Geology, the "Squire" Law Library, Law School, and Archæological Museum. The Law Library occupies the centre, and is supported on three open arches, with five deep bay windows above: the whole is most effective. Mr. E. S. Prior's new medical laboratories at Netley (1542) are treated in red brick and stone, with a rusticated base pierced with small semi-circular barred windows, the effect being solid and compact. The same cannot be said of the design for Government offices at Zurich, by Mr. Alexander Koch (1536), which is of the "spiky" order, though it presents an effective sky-line. In "Hamilton House," on the Embankment (1582), Mr. William Emerson has the courage to use large expanses of plain wall surface, with good results, especially on the east and west facades; but the details of the windows—with curious mouldings, Indian in style—are not good. This building, however, is far better than his Royal Caledonian Orphan Asylum at Bushey (1584).

Several good churches are shown, particularly those of Mr. Bodley at Ecclestone and Chapel Allerton (1664 and 1654 respectively). Mr. E. B. Lamb is also very successful—his design for a national monument to British heroes (1664) shows a large central tower with spire, around which numerous turrets and buildings cluster, forming a pyramidical composition. Mr. Caröe is not seen to advantage—his Stoke Damerall Church, Devonport (1543), has a tower altogether restless and top-heavy. Of the remaining exhibits, the memorial bridge by Mr. Beresford Pite (1672) is very distinctive. This bridge has five arches, with a group of sculpture arranged across the bridge over three more arches, a colonnade extending at each side. Mr. Pite has made the drawing himself in his well-known manner. Mr. Hamo Thornycroft shows his design (1555) for a bronze canopy to form part of the Dean Colet Memorial to be erected at St. Paul's School, West Kensington. The canopy has slender floriated stems, with a corona filled with lettering, but the treatment is far from satisfactory. Mr. Halsey Ricardo exhibits the joint terminal station at Howrah, Calcutta (1588)—a clever design. This completes our notice. It will be seen that though there is much to interest, there is nothing of superlative merit, and many men of note—such as Mr. Norman Shaw, Mr. Wilson and Mr. Alfred Waterhouse—do not exhibit. Next week we shall deal with the sculpture.

SOME NORTH CORNWALL CHURCHES.—II.

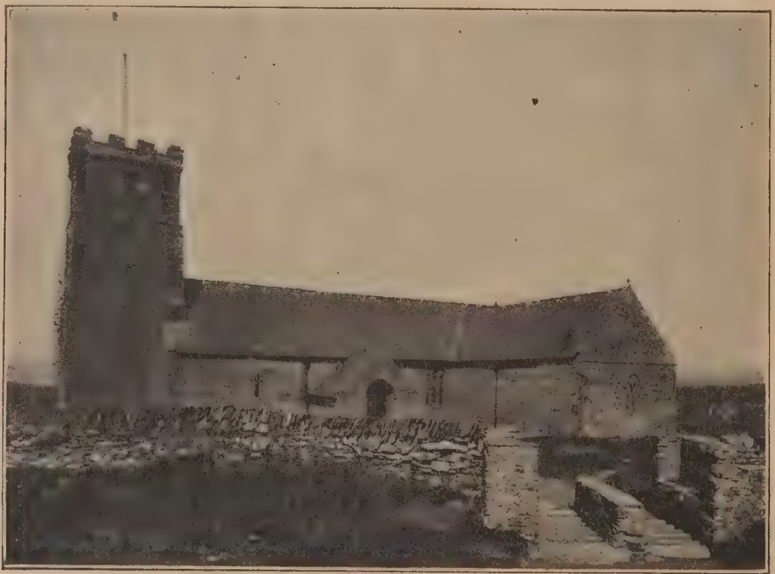
By FRANK BAINES.

(Concluded from p. 233 of No. CCCXXV.)

It is curious to find so many fragments of Norman work in and about the churches, and yet so rarely to meet a complete piece of Norman building. The arches on the north side of the nave of St. Minver are said to be Norman, but besides there being a very grave doubt as to the truth of this, there is little distinction about them. The most curious find I had in this way was coming across a vast Norman capital, set in one of the churches upright upon its necking, of undoubted Norman origin. The building, if any, to which it had belonged must have been six or eight times the size of the average Cornish church, but no further traces were to be found anywhere in the vicinity.

Mawgan will make its claim upon the admiration of the visitor in many ways. The church is literally embowered in lofty Cornish elms, that small-leafed variety which is met with so frequently about the hills and combes of this beautiful county.

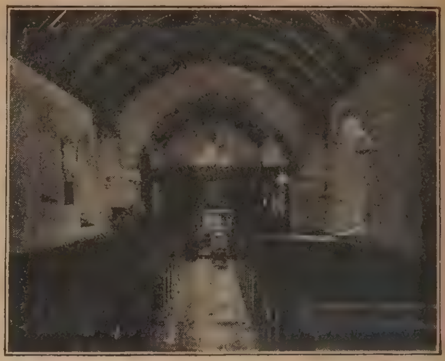
The church most unlike Mawgan in its sternness of situation, its cold aloofness from Nature in her softer aspects, is Tintagel. Standing upon an extreme headland, it overlooks all the coastline south to Pentire Point, and north past Bude and Bos to Hartland light, and far Lundy, set in the sea as a weather gauge. The church of St. Marcelliana, named from one of the nine saints who sailed miraculously from Ireland on a mill-stone, about the sixth century, stands upon the cliff west of the castle ruins. Although it was restored about 1870, two early Norman doorways remain almost untouched, one of which has a solid tympanum. It is built in the form of a cross without aisles, with Lady chapel and transepts considerably larger than is usual in Cornwall, and a solid circular Norman arch. The interior is very dark, and it seems as if the builders did not wish to give the uproarious elements one bit of advantage more than was essential. To be in this sombre building when a great west wind is beating in from the Atlantic, and the roar of the waters below comes up with the spray, is an experience to value. The church is full of interesting details, the Norman font on its four spreading legs being not the least among them. A curious recessed tomb is in the south wall, almost opposite the squint, the walls about which are much older than the main building and said to be Saxon. There are the remains of a carved screen, the tracery of which has been beaten out in places. It is fourteenth-century work, and almost black oak, very well preserved in the parts left. Within the vestry is an old stone altar, quaintly cut with five crosses, which is now evidently used as a robing table. The people at Tintagel appreciate the force of their storms, for even the tombstones are buttressed against them. Nothing grows here on the bare stone walls about the churchyard; only in between the leaning stones the long coarse trumpet grass flourishes with purple patches of the sea pink. There is no gate by which to enter the churchyard: a break in the wall merely serves its purpose, with bars of granite laid horizontally 6in. or 8in. apart with a cavity of 9in. or a foot deep in between. This is to prevent the sheep straying into the churchyard to graze, and acts as a real preventive. The church has one of the few good Cornish brasses of early fifteenth-century date, strongly lined, and in memory of one Johanna, whose lineaments it portrays. The church of Mawgan contains four or five very good brasses of fourteenth-, fifteenth- and sixteenth-century workmanship—one to the daughter of Sir John Arundel, whom, so runs the inscription, served five queens. In St. Columb Major are three more brasses, very well executed, and one that looks like foreign workmanship, laid to the memory of the same noble family.



TINTAGEL CHURCH.

A word must be said of Tintagel Castle, although its interest is mainly of the sentimental and picturesque. A weird wild look it has climbing up the steep hillside overlooking both bays and running right to the very verge of the sheer cliff edge. The towering pillar and crumbling column of King Arthur's seat is but the place of sea-birds now; no foot could reach its height since the seas have invaded it, as is shown by the landslip between it and the main cliff. The date can only be arrived at approximately, but it is put anterior to the Conquest; and in 1330 the castle was sufficiently of a ruin for its timbers to be taken down from the great hall.

About a mile and a half from Tintagel, driving inland, is a charming old house called Trethevy, near St. Knighton's Kieve and waterfall. Its window frames, door posts and lintels are of old carved oak taken from a stripped chapel near by. There were two benches built up of the same fragments, and Sir Henry Irving, visiting here prior to his production of King Arthur, bought one of them for the staging of that play. The chapel mentioned is now used as a cow-house; and if the visitor has enthusiasm enough to brave the terrors of accumulated droppings about the place, he will see a piscina above the troughs and quaint pointed windows without tracery, and a fourteenth-century arch circling above the backs of the cattle within. I should like to mention here the fine old farmhouse of Tresungas Barton as being the most interesting of all the countryside. It was built about 1250 and rebuilt in 1660. A square, low battlemented tower marks the entrance, with wings on either side. Unfortunately the left wing has had double-hung sashes put in place of the old windows, which were blocked up with stone to escape the window tax. The lights have not even yet been replaced in the top windows of the tower and some windows in the gable which juts out from the extreme end of the left wing. The building is much admired by its present holder, and great care has been taken to preserve it without effacement of any kind The rooms are large, with low wood ceilings, and all the windows, except the three double hung sashes, are twisted bulging leaded lights very heavily leaded, and quite weather-proof in spite of their age. There are signs to show that the building was originally much larger, the space now occupied by the rick and poultry yards and farm buildings being included within it. It was used by the smuggling community, earlier in its career, a boarded-up staircase leading to vaults which evidently served the purpose of secret storage. There are tales of an underground tunnel leading to the coast, but they are absolutely unauthenticated; yet there is little doubt that the original building saw stirring times. This farm is an excellent centre for the churches mentioned all round, many being within fair walking distance, and the remainder reached by drives through beautiful country by coast or inland roads.



TINTAGEL CHURCH.

The church of St. Minver is a landmark for miles, its tall well-proportioned spire rising into the view when all else of the church is hidden. This church is without a rival, for none other in North Cornwall has a spire to compete with it. The west tower is Early English, as is the main building, but the spire is of a much later date, having been blown down and rebuilt. There have been Perpendicular additions which have nothing striking about them. The points most in favour about the church are its cool ample proportion; its fresh sweet-coloured stone arches, which give a silver-gray tone to the whole of its interior; and its numerous bench ends. Many of these are remarkable for the strange working of ideas and quaint fantasy of design. The best of them are fronting one another in the nave. Here are to be seen weird beasts and birds, some of the wildest imagination, and most excellently preserved in the restoration of the building. The church was restored by Mr. Pier St. Aubyn, who has, indeed, restored many of the Cornish churches. It has been most thoughtfully carried out, with great care and taste, every effort being made to preserve intact the old work in its original position. This, Mr. St. Aubyn has not always been perfectly successful in, but the work at St. Minver and St. Columb Major is eminently so. Some of the bench ends have in time past been badly used; these are now made good by pieces fitted in where necessary, and both new and old left the natural colour of the wood, so it can be seen at a glance how far the old goes. Most of the roofs in Cornwall are of the cradle type, and St. Minver's is no exception; but very few of the old beams remain, and the original deeply-carved wall-plate has almost completely vanished. Behind the altar and beneath the tower are some deeply-incised slate slabs. This is common everywhere about the country, some reaching a great perfection in execution and design. Many are of late seventeenth-century style, and I was surprised to see set in the paving of St. George's Chapel, Windsor, a slate slab very similar to one seen in a Cornish church some years before. In the churchyards are to be seen slate slabs even undercut, and rather like high-relief wood carvings than cuttings in the slate; they are so finely carved as to be almost like a drawing upon the stone.

The church of St. Mabyn also calls attention to itself over miles of country—the tall tower appearing above the horizon from almost any point of view—the church itself standing upon high ground. The tower was badly damaged by lightning in 1865, and has consequently been restored, thus losing much of its attraction. Grotesque corbels terminate the angles of the tower, and four niches hold four quaint statues high up in it. The building is mostly Perpendicular, restored rather unsympathetically, yet there is some excellent detail to repay the visitor.

St. Columb Major is situated in the upper part of the lovely valley of Lanherne. The church, which was restored in 1867, is one of few examples of tall and graceful architecture in this part of Cornwall. It is of great size for the county, and even to the uninitiated is very beautiful. The piers and arches of nave, south-porch door, and window in south transept are all Early Decorated of a pure high character, as is also the font. The tower is the happiest expression of the Perpendicular to be seen in North Cornwall; the slight graceful buttresses rising tier by tier to the pinnacled corners of the battlements, and the admirable proportion, contrive to make it a perfect example in its way. It stands upon open arches on its north, south and west sides, the font almost beneath it having four strange grotesques cut on its sides with rolling protruding tongues. The beautiful window in the south transept has been barely touched in the restoration, and is a fine example of geometrical tracery. Many of the old roof-beams remain, and the moulded and carved wall-plate can be well seen from the floor of the nave. A very interesting stone altar was found prior to the restoration, under the floor, and has now been placed upon granite shafts within the chancel. This church contained an old pulpit, which, unfortunately falling into decay, has since been removed. It was much like one to be seen at St. Teath Church, richly carved and with rather a strange scheme of colour carried out upon it. By far the most interesting and striking pulpit of this part is to be seen in Mawgan church. An elaborately-carved cornice runs completely round its top, and a crowded carved moulding at the base. Between these are five panels, in which are carved the symbols of the Passion in high relief. They are very realistically rendered, and make an impression some distance off.

Many churches have been left without remark here—churches which would well repay an examination, yet an end must be made somewhere, and no more fittingly than at the charming church of St. Columb Major.

The striking interest of this North Cornwall architecture is its homeliness, its quiet partnership with the people, their life and the county It is really a part of Cornish history, which in itself is fascinating enough, but which in conjunction with the architecture is even more so. I should like to end with the words of the late Mr. J. D. Sedding. "The Cornish churches," he says, "are . . . to many full of a peculiar, inexpressible charm. These simple structures seem somehow to be part of the simple nature of the moor and down which surround them; they have what painters call quality or tone in them; they are essentially human, eloquent of the character of the men who reared them; and they are full of the silent poetry of an art that was religious while it was human, and that reflected far-reaching traditions while it was full of contemporary life and thought."

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TESTS WITH FIRE-RESISTING MATERIALS.*

A SUMMARY OF THE BRITISH FIRE PREVENTION COMMITTEE'S WORK.

By ELLIS MARSLAND.

BY the kind permission of the executive of the British Fire Prevention Committee, I am enabled to give you some account of the tests and experiments with fire-resisting materials conducted by them, in the hope that they may be of interest to those engaged in building operations and to those who take or have any interest in preventing the spread of fire.

The work of the Committee, so far as it has been undertaken, may be divided under four heads:—

(1) Experimental test with floors, commencing with simple forms of construction deemed to be fire-resisting only, and proceeding to more complex forms deemed to be fireproof.

(2) Experimental tests with fire-resisting partitions of various construction.

(3) Experimental tests with doors of various constructions, both of wood and iron, or a combination of both.

(4) Experimental tests with protective coverings to openings and methods of glazings which in themselves form a protection against fire. This last is a very important factor in dealing with fire-prevention, as, however fire-resisting a building may be in itself, unless it can resist fire from the outside it is as liable to destruction as the most inflammable building.

In commenting upon the different forms of construction and their behaviour under the fire tests to which they were submitted, I do not propose to mention any names, for reasons that may be sufficiently obvious, but shall merely differentiate between the test initiated by the Committee and those submitted for test by manufacturers; any further information is to be obtained in the official published reports.

For the information of those who are not familiar with the system and plant employed by the Committee, I may say that the tests are conducted in a block of brick huts about 10ft. square inside and others 10ft. by 22ft. 3in. The method of producing the heat is by a gas generator, and the gas is conducted to the several chambers by cast-iron pipes. The record of the temperatures attained in the chambers is taken by means of electrical pyrometers, similar to those used in the Royal Mint.

A Test with an Ordinary Floor.

Starting with experimental tests with floors, the first to which I shall direct your notice is an ordinary floor with deal joists, the soffit of which was protected by plaster, termed asbestic plaster. This was applied on ordinary wood lathing, and the thickness of the plaster after completion was about 1⅛in. On drying this reduced itself to about ⅞in., and during the process of drying cracks developed over the surface. Before the test these were stopped. The test lasted forty-five minutes, the temperature gradually rising from 500 degs. to 1,500 degs. Fahr. The summary of effect is as follows: No perceptible difference in the ceiling was observed during the progress of the test. The application of water caused no injury to the ceiling. No portion of the ceiling fell either during or after the test. When examined after the test cracks had developed over the surface, and some of the wood laths were charred, but none had ignited. This test may be considered satisfactory, as the object was attained, namely, to render the floor fire-resisting for forty-five minutes, which would under ordinary circumstances, have allowed th, occupants in the rooms over to have escaped.

A Similar Floor Protected with Slag Wool.

The next test is of a similar nature. The floor was of ordinary joists and boarding, but the protecting material to the soffit was slag wool 1¾in. thick. This was secured with screws to the soffit of the joists and a ⅜in. matchboarded ceiling was placed under the slag wool. The testee decided to have a test of an hour's duration, with a gradually increasing temperature to 1,800 degs. The summary of effect was as follows: At the conclusion of the test the flooring on top was, so far as could be seen, uninjured, and when the joists were examined they were sound. The boarded ceiling had, of course, disappeared, but the slag wool remained in position and had protected the floor. A good deal of heat was retained in the floor, and at one point, where water had not been applied, a small hole was burnt in the flooring about three hours after the test was concluded. This test may also be considered satisfactory, as it retarded the spread of the fire for at least an hour.

A Floor with Baulks of Timber Side by Side.

We now come to a test of an interesting nature as showing the fire-resisting qualities of simple baulks of timber laid side by side, any spaces between being filled with fireclay grout, the soffit not being protected in any way; the thickness of the baulks was 9in. This was the Committee's own test, and it was decided to have an eighty minutes' one, the temperature gradually rising to 2,000 degs. Fahr. The result was that the under-surface of the wood beams was charred to an average depth of about 2in., but beyond this no damage was done. The test clearly demonstrates what fire-resistance there is in such a floor, but it must be carefully borne in mind that no space must be left between the timbers that is unfilled by the grouting, otherwise the fire draws up through and spreads to the next floor.

Section 74 of the London Building Act provides that, in premises exceeding 1,000 sq. ft. in area and used partly for purposes of trade and partly as a dwelling-house, the part used for purposes of trade shall be separated from the part used as a dwelling-house by floors and walls of fire-resisting materials. This does not of course imply that the floor is to be fireproof, but the floor is to be sufficiently fire-resisting to prevent the spread of fire at least for a reasonable time, to give an opportunity for the inmates above to escape. And in the schedule of materials deemed to be fire-resisting concrete filled in between joists of floor is included.

Test with a Floor of Wood Joists and Concrete.

The Committee thought that a test in this direction would be of considerable interest, and yield some useful information. Accordingly they made preparations for the simplest interpretation of the section, and arranged a test. With 7in. by 2in. joists, ⅞in. flooring, coke-breeze and Portland-cement concrete, 5 to 1,

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* A paper read before the Society of Architects on April 25th, 1901.

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filled in between the joists to a depth of 5in., and kept in position by 1in. by ¾in. fillets nailed to the sides of joists 2in. from the bottom, a ceiling was nailed on to the soffit formed of ⅝in. matchboarding. The time decided for the test was seventy-five minutes, commencing with a temperature of 500 degs. and increasing to not more than 2,300 degs. The floor also was to be loaded with 100lb. per sq. ft. distributed. The result of the test far exceeded the Committee's expectations; it was not till after eighty-two minutes that the floor collapsed. The summary of effect is as follows: In fifteen minutes all the boarding to the soffit was consumed; in fifty-four minutes flame came through the floor between the last joist and the wall.

I should like to point out here what an important part the 1in. by ¾in. fillets played in the construction of the floor in preventing the fire getting through, and it was in consequence of the fillets being omitted on the outer side of the two end joists that the flame came through there, and these joists were the most damaged.

The concrete between the two east joists fell out in seventy-four minutes; meanwhile the fire had been gradually eating its way up the other joists from 2in. to 2½in.; being thus reduced from 7in. to 5in., or 4½in., they could no longer sustain the weight of 100lb. per sq. ft., and the floor and load collapsed in eighty-two minutes. This was a very severe test for so light a floor, and I think you will admit that it stood it bravely. The floor boards were not burnt, but only blackened by the smoke.

Another Wood and Concrete Floor Test.

A test of a somewhat similar character to the one just mentioned was instituted to discover the fire-resisting qualities of different descriptions of concrete. This floor was constructed of 3in. by 9in. deal joists spaced 16½in. centre to centre, which gave seven bays. Two of these bays were filled in to the full depth of the joists with coke-breeze and cement-concrete, 6 to 1. The next two bays were filled in with pit ballast and cement-concrete, 6 to 1, and the remaining three bays were filled in with concrete composed of pit ballast 3 parts, coke-breeze 3 parts, and cement 1 part. The concrete was supported between the joists by 1½in. by ⅞in. fillets. The soffit of the ceiling was plastered render float and set, and ⅞in. flooring was nailed on top of the joists to complete the floor. It was decided to test this floor for one hour and a half to a gradually increased temperature up to 2,500 degs. Fahr., and then to apply a stream of water for four minutes. The summary of the test was that after a few minutes the plaster of the ceiling began to fall, whereupon the lower edges of the joists became ignited and gradually burned upwards. At the conclusion, the whole soffit of the floor was seen to be fully incandescent, particularly that in the coke-breeze and cement bays. On the application of water the soffit of the ballast and cement-concrete and the ballast-breeze and cement-concrete immediately disintegrated, and about 3in. in depth of it fell. The coke-breeze and cement alone was not affected. The floor remained in position at the conclusion of the test, but appeared seriously weakened and deflected.

It is to be regretted that it did not remain in position sufficiently long to be photographed, but after a test of this description a good deal of latent heat remains in the materials, and the joists being of combustible material continued to smoulder, the result was the collapse of the floor five hours after the test. On examining the remains the joists were found to be burnt through from 2in. to 6in. deep, and tapering to a further depth at the ends. The boarding was found to be slightly charred on the underside and at the joists, but otherwise was sound.

It could not be said the fire had passed through the floor, although smoke came through, and I think the floor may be considered a fire stop, although the weight of the concrete caused the collapse of the floor, and might constitute a source of danger on that account.

The behaviour of the ballast-concrete shows it an undesirable material for fire-resistance, while coke-breeze has many advantages. I might add here that, from my observation of the tests conducted by the Committee, it is the more porous and light of the incombustible materials that are the most fire-resisting.

Floor with Expanded Metal Ceiling.

The experience gained by the last two tests paved the way to the next; both the previous tests had shown that if the soffit of the joists had had further protection the fire-resistance of the floor would have been greater, consequently a test was arranged with an expanded metal ceiling suspended 2in. below the bottom of the 7in. by 2in. wooden joists, which formed a centering for the concrete as well as a key for the plaster. The concrete below the joists was of dry ashes and Portland cement, and that between the joists was composed of coke-breeze 3 parts, dry ashes 2 parts, and Portland cement 1 part. The test was arranged for two hours, which is the longest time yet given for a floor formed partly of combustible material. The temperature was not to exceed 2,300 degs. Fahr., and to be followed by a stream of water for two minutes. The floor also was to be loaded with 100lb. per ft. distributed.

The summary of effect is very short: In twenty-eight minutes plaster began to fall in patches from the ceiling, and continued to fall at intervals till the end of the test, when water was applied and further plaster was washed away. No other effect of the fire was noticeable, and at the conclusion of the test the floor was intact and carried its load. This floor did not subsequently collapse, although it smouldered all night. It was found that all the joists had been more or less damaged by the fire smouldering all night; portions of them were quite consumed, leaving the matrix only in the concrete. The least damaged of the nine joists forming the floor was the centre one, which was intact but for a piece about 12in. long and 5in. deep, which was consumed about 15in. distant from the south end.

This irregular consumption of the joists I am inclined to think was due to the difficulty of so filling in the concrete on the soffit of the joists as to form a complete protection; the vertical strips of expanded metal which carried the horizontal portion conducted the heat up the joists, and appeared a source of weakness so far as the fire-resistance was concerned.

Floor with Terra-Cotta Wired Lathing.

The next test, which was submitted by a manufacturer, deals with a floor supported by 9in. by 3in. wooden joists with a terra-cotta wired lath suspended ceiling, an air-space between the ceiling, and the concrete filling between the joists. The lathing was spread over the top of the joists, and depressed in the centre to the shape of an inverted arch; upon this the concrete was placed to a depth of 7in. in the centre, which when levelled brought it 2in. thick over the top of the joists. The concrete was of Portland cement and washed sand, in the proportion of 1 yd. of sand to two bags of cement. The suspended ceiling was formed of terra-cotta wired lathing secured to iron rods fixed to the soffit of joists with iron hooks. Ordinary three-coat work was applied to the lathing, but a proportion of plaster-of-Paris was incorporated with the material. The thickness of the plastering was 1⅛in. The test was arranged for one hour and a quarter, the temperature was not to exceed 2,000 degs. Fahr., and the floor was to be loaded with 56lb. per ft. distributed.

The summary of the effect was that a considerable portion of the plaster ceiling fell during the test, some of the lathing being bare before the test closed. The floor cracked at each side to the extent of ½in., and dropped ¼in. When water was applied, smoke, steam and sparks came through the cracks in the top of the floor. One of the joists carrying the ceiling was entirely destroyed, two partially so, and one though discoloured was practically sound. This floor did not collapse, but its supports were practically destroyed; it trusted for its fire-resistance to the suspended ceiling on the terra-cotta wired lathing and air-space, but after the ceiling was pierced, the heat had full play around three sides of the deal joists, and so brought about its ruin. A floor of similar construction, but with iron supports, will be mentioned later.

Fireproof Floor.

We now come to floors having pretentions to be fireproof, *i.e.*, the constructional parts of the floor are of non-combustible material. The Committee started with a simple iron and concrete floor, the soffits of the iron joists forming the floor being exposed. The Committee were somewhat criticised for instituting this test, as being a useless one, the result of which was already known. But I think the Committee were perfectly right in having it: firstly, because it is a very common form of fireproof floor, and, secondly, it gave the Committee data from which to start in showing by comparison the advantage to be derived in protecting or encasing the ironwork. The floor was constructed of 5in. by 4½in. steel joists placed 2ft. 6in. apart, and filled in with coke-breeze and Portland-cement concrete 5 to 1. It was loaded with 168lb. per ft. distributed. It was proposed to test this floor for two hours and a half up to a temperature of 2,300 degs. Fahr., but after one hour and twenty-five minutes, and at a temperature of 1,650 degs., the bulk of the concrete in the two outer bays collapsed owing to the deflection of the steel joists. The floor began to deflect after twenty minutes at a temperature of 1,200 degs., and a maximum deflection of 10½in. was recorded in one of the joists. The coke-breeze concrete was but little deteriorated. The disadvantage of filling in concrete between joists is in setting up and striking the centering and the attendant obstruction to the progress of the works by the supports.

Corrugated-Iron Centering.

The Committee instituted the following test in which corrugated iron filled in between the iron joists was the centering employed, the coke-breeze and cement concrete, 5 to 1. filled in on top. The soffit of the joists and corrugated-iron centering was protected by 2in. by 3in. deal ceiling joists suspended from the joists, and wire netting, ½in. mesh, was used as lathing and a plaster ceiling, three-coat work, applied; 1in. floor boards were nailed to the breeze-concrete on top, the floor and ceiling having a total thickness of about 12in. The floor was loaded with 158lb. per sq. ft. distributed. The test was to last one hour and a quarter and the temperature to be 2,000 degs. Fahr. In half an hour the ceiling began to fall, and in one hour the ceiling and ceiling joists had all fallen. At the conclusion of the test the soffit of the iron joists and corrugated-iron centering were observed to be red-hot, and the joists had deflected about 2¾in., but on cooling returned to within 1in. of level. The fire did not pass through the floor, but perhaps the test was hardly sufficiently long to enable a comparison with the former floor to be made, but certainly the deflection of the joists was not so great, and the floor would have been more serviceable without reconstruction, which the former floor would have not.

Floor with Expanded Metal as Centering.

The next floor is one in which expanded metal forms a centering as well as lathing. The construction of the floor was by iron joists 4ft. 9½in. apart, on the top of which the expanded metal is stretched and 3in. of furnace ash and Portland-cement concrete laid and finished on top with ½in. of cement and sand. The joists are protected with a suspended ceiling of expanded metal and ordinary plastering applied. The space between the floor and ceiling was ventilated by means of holes in the walls of the chamber. The floor was loaded 140lb. per ft. distributed. The test was to last one hour and fifteen minutes, and the maximum temperature was to be 2,000 degs. Fahr. The result was that during this time the fire did not pass through the floor. The plaster ceiling remained intact until the application of water, when some of it was washed away. There was a slight deflection of the floor and ceiling. It is to be observed that considerable advantage was gained by the space for ventilation, which in practice is not always obtainable.

Terra-cotta Wired Lathing for Centering and Ceiling.

We now come to the floor to which I before alluded, and it is on the same principle, but steel joists are substituted for the wooden ones. Terra-cotta wired lathing is used both for the centering and ceiling. The test was to be of 1¼ hours' duration and the temperature was not to exceed 2,000 degs., and the load 1½ cwt. per sq. ft. distributed. The result was the fire did not pass through the floor, but on water being applied some of the plastering was washed from the lathing. So little was the floor damaged that the testee decided to re-plaster the ceiling, and the test was renewed at a subsequent date, when practically the same results were observed.

The Last Floor Test.

The last floor test to which I invite your attention is one of 2½ hours. The floor was constructed of iron and concrete in which all the ironwork was embedded. The steel joists are spaced 6ft. apart, over which are placed stirrups to receive the bridging bars spaced 20in. apart. A slab of concrete is suspended to the soffit of girder, and a wood centering is necessary for filling in the concrete which is composed of clinkers broken small, sand and Portland cement, in the proportion of 4 parts clinkers, 2 parts sand and 1 part Portland cement. The concrete was 4in. thick, and a further depth of coke-breeze and Portland-cement concrete, 2in. thick, was filled in on top of this between the floor strips; the soffit of the floor and the sides and soffits of the steel joists were rendered in plaster three coats. The summary of this test is thus recorded: The plaster on the underside of the ceiling and around the beams cracked slightly before the application of water. On the application of water some of the plaster fell off the soffit of the ceiling and beams. The concrete forming the floor was not damaged. That enclosing the beams was slightly damaged and cracked. The fire did not pass through the floor. The wood strips bedded in upper surface of the concrete were uninjured. The test of this floor was a severe one, but not too severe for a fireproof floor, as any floor professing these qualifications should be at least able to stand a 2½ hours' test, otherwise it could only rank as fire-resisting. It should also be able, after serving as a fire stop, to be repaired and made good without reconstruction.

Tests with Partitions.

I will now pass to a short series of tests with partitions. It was necessary that the Committee should first obtain some data as to the fire-resisting qualities of the ordinary kind of partition used in buildings, namely, the lath and plaster partition with wood laths, the same with wire lathing, and the brick-nogged partition with bricks laid flat and also on edge.

This series was tested together, and the partitions were arranged with a passage 2ft. 4in. wide formed in the centre of a hut, and the partitions of the four different classes built on each side, the fire being arranged on one side of the partitions only.

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The summary of the test is thus recorded: The lath and plaster partition on the right was practically destroyed. Fire broke through the portion with the wood lathing in twenty-eight minutes at a temperature of about 1,600 degs. Fahr., and through that on the wire lath in forty minutes at about 1,750 degs. Fahr. The brick-nogged partition resisted the passage of the fire for the hour, although the plastering was disintegrated and studs charred at a temperature of 2,000 degs. Fahr.

A partition may be made fire-resisting in various ways. It may be constructed of combustible material and be packed with incombustible material like brick or slag wool. It may be constructed of combustible material, and such material may be made chemically fire-resisting. It may be constructed wholly of incombustible material. I am enabled to give you the result of tests with each of these forms of construction.

A Stud Partition protected with Slag Wool.

The first of these is with an ordinary stud partition, matchboarded on both sides and packed between the two thicknesses with slag wool. The testee desired a forty-five minutes' test and a maximum temperature of 1,800 degs. Fahr., followed by the application of water for one minute on the outside and two minutes on the inside. The summary of the test is thus recorded: The internal boarding was completely destroyed. The slag wool was fused and blackened on the inside face, and a narrow strip down the side of each stud was blackened. The studs were burned down ¾in. deep. The wire netting was sound. The studs were sound, white and clean for a distance of 2¾in. The outside boarding was sound, white and clean. both on the fire and passage, and the fire did not pass through the partition. Thus the partition formed an effective fire stop for a period at least of forty-five minutes.

Two Stud Partitions Tested Together.

The next is a comparative test between an ordinary stud partition, match-lined on both sides, painted with oil colour, and a similar partition with chemically-treated wood, and painted with a chemically-prepared paint to assist its fire-resistance. Fire was to be applied to one side of the partition and at one point for a period of forty-five minutes. On the other side of the partition some furniture and hangings were placed. The partitions and furniture were identical so far as construction was concerned, and the tests were started simultaneously in both huts.

Dealing with the non-treated wood first, the summary of the result is as follows: In three minutes smoke appeared in the interior of the chamber. In fifteen minutes sparks appeared in the chamber over top of door. In sixteen minutes flame over top of door caught muslin hangings. In thirty minutes fire all along top of partition. In thirty and half minutes the furniture began to burn; and in thirty-two minutes everything was blazing freely, and the whole chamber was full of flame. In forty-five minutes everything was consumed except the studs, which were blazing freely.

The result of the chemically-treated partition and furniture is as follows: In twenty minutes the chamber was full of smoke, with offensive smell. In twenty-nine minutes two lower boards of partition buckled near the gas flame. In forty minutes charred pieces falling from partition in passage. In forty-five minutes wood flaming in third board from bottom over third stud from east wall in passage. At the close of the test the chamber was entered and the furniture, curtains, &c., were found intact and unaffected except at the east end, where they were scorched by the burning timber roof of hut. At no time during the test did the temperature exceed 100 degs. Fahr. The result of the test is sufficiently obvious to need no further remark.

A Partition of Terra-Cotta Wired Lathing.

The next and following tests are all with partitions formed of incombustible materials. This partition was formed of terra-cotta wired lathing, fixed to the floor and ceiling, and covered with three coats of plastering on each side, in which plaster-of-Paris was incorporated. The partition when finished was 2½in. thick. The testee desired a test of one hour and fifteen minutes, and a maximum temperature of 2,000 degs. Fahr. The summary of the result is thus recorded: A portion of the setting coat on the fire side of the partition fell during the application of heat. Hair cracks, from which steam issued, appeared from time to time on the passage side of the partition. On the application of water on the fire side of the partition a considerable portion of the setting coat was washed off. The temperature of the outside face of the partition during the latter part of the test was too hot to bear the hand, although not sufficient to ignite a vesta by contact. The fire did not pass through the partition. It will thus be seen that, as a fire stop, for one hour and fifteen minutes the partition answered its purpose.

Steel Lathing.

A partition on similar lines, *i.e.*, plaster on both sides of a lathing medium, is the next which I wish to describe. The lathing medium was of steel sheeting, No. 28 gauge, and formed into dovetailed corrugations, fitted into **H**-section standards. The plaster was of ordinary material mixed with plaster-of-Paris, three coats on each side, the total thickness when finished being 2in. The testee desired a test of one hour and fifteen minutes with a maximum temperature of 2,000 degs. Fahr. The result of this test is thus recorded: Hair cracks, from which the steam escaped, appeared from time to time on the passage side of the partition. The temperature of the outside face of the partition during the latter part of the test was too hot to bear the hand, and paper held against it was scorched. The fire did not pass through the partition during the one hour and fourteen minutes it was applied.

Two Partitions Built up of Slabs.

The last two partitions to which I shall allude are built up in slabs. The first is in slabs about 1ft. 2in. by 8in. and 3¼in. Each slab has two circular holes 1⅝in. diameter running horizontally through it; the slabs were jointed in hydraulic lime and sand mortar, the joints of the slabs on the fire side were raked out and pointed in fireclay, and the whole surface was covered with a thin coating of the same material. The composition of the slabs is thus described: A mixture, by means of water, of plaster, hydraulic lime, some sort of neutral material, such as coke, sand, &c., and fireproof material such as asbestos with an addition of sulphuric acid. The result is thus recorded: A portion of the coating of fireclay on the fire side of the partition fell off on the application of water, as also most of the fireclay pointing to the joints. In no place had the fire passed through the partition. This partition for the sixty minutes of the test certainly acted as an effective fire stop.

The other partition was composed of slabs 4ft. 10½in. long, 10in. wide and 2¾in. thick; one face was fair and the other keyed for plaster. The slabs, according to the maker, were made of plaster with cocoanut fibre, cork dust and reeds embedded therein, and running horizontally along the whole length. There were from thirty to forty reeds in each slab. The slabs were set in mortar composed of two parts plaster-of-Paris, one part of lime and two parts of sand, and the vertical joints were grouted in with the same material. The inside of the partition was plastered in two coats, the ordinary materials being mixed with plaster-of-Paris, and the outside was skimmed over with one coat of lime, putty and plaster-of-Paris in equal proportions. The testee desired a test of one hour and a quarter with a maximum temperature of 2,000 degs. Fahr. The result of the test is thus recorded: The setting coat on the fire side of the partition fell during the application of heat. A portion of the rendering on the fire side fell on the application of water. The fire did not pass through the partition. No effects of the fire were apparent on the passage side of the partition, except two blisters and some hair cracks following the courses of the joints. The temperature on the outside face of the partition at no time exceeded 125 degs. Fahr. The plastering on the inner face of the partition was cracked and disintegrated. On examination after the test, the face of the slabs next the fire was found disintegrated to a depth of about ¾in., the remainder of the slabs being unaffected. This partition, then, may be classed as a fire-stop for at least seventy-five minutes.

Fire Tests with Doors.

I now come to a very interesting series of tests with doors of various constructions and various materials. The Committee were led to undertake this series with the view of ascertaining the length of time a door required under section 74 of the London Building Act would act as a fire stop. The section runs: "Provided that there may be constructed in the walls of such staircases and passages such doorways as are necessary for communication between the different parts of the building, and there may be formed in any walls of such building openings fitted with fire-resisting doors." On turning to the schedule of materials deemed to be fire-resisting, we find in the case of doors, oak or teak or other hard timber not less than 2in. thick.

For the purposes of comparison it became necessary to first of all ascertain the resistance of any ordinary deal door, and then of a solid 2in. door of the same material. These tests are made more interesting as the Committee were enabled to take photographic records of the outside of the several doors during the progress of the tests.

A Ledged Door and a Four-panel Door.

The first of the tests is that of an ordinary 1in. ledged door and a 2in. four-panel moulded both sides door, with panels ⅝in. thick; they were fitted into the recessed wall, built about 14in. back across the hut, one side of the door being in the chamber and the other side exposed to the external air. This arrangement was identical for all the tests, so that a separate description of the size and position of each door will be unnecessary. After twenty-five minutes the doors were practically destroyed.

Following upon this are two 2in. bead butt both sides doors, with 2in. solid panels. One was of deal and the other pitch-pine. In seventeen minutes flame appeared over the top of the deal door, and in twenty minutes over the top of the pitch-pine one. After fifty-five minutes, the doors were almost consumed.

Oak and Teak Doors.

We now come to the hardwood doors which are to be the fire stop. A test was made with a 2in. door as previously described of American oak, and one of Moulmein teak. After thirty minutes' test the condition on the outside was thus: The fire came over the top of the teak door in seven minutes, but it did not appear over the top of the oak one for thirty-five minutes; in fifty-five minutes the doors were practically destroyed. It should be pointed out that it is very desirable that the doors should fit as closely as practicable: the reason for the flame coming over the top of the teak door so soon was in consequence of it not fitting closely to the frame. Another teak door of similar construction, but somewhat thinner and with the panels in two thicknesses, will be dealt with later on, when the first appearance of flame was after eighteen minutes.

Doors of Austrian Oak and American Walnut.

The next two doors are of Austrian oak and American walnut; the flame did not come over the top of the oak door till thirty-three minutes after the fire was started, but in the walnut door flame appeared at intervals after fifteen minutes. After fifty minutes, the oak door had had the worst of it.

The last doors tested in this series were of Honduras mahogany and poplar. The fire came over the top of the poplar door in three minutes and over the top of the mahogany one in ten minutes. The condition of the doors after thirty minutes was thus: The poplar door had all the upper part consumed. It had all disappeared in forty minutes, and a temporary door had to be fixed in its place to continue the test of the mahogany door, which collapsed at fifty minutes.

These two doors did not stand so well as the deal and pitch-pine ones, although in justice to the poplar door it had somewhat warped away from the frame at the top and greatly facilitated the flame coming over and its consequent rapid consumption.

Doors of Three Thicknesses.

The Committee's experience with this series of doors led them to experiment with doors made of material in three thicknesses, and two doors were made, one of deal and the other of pine. The material was in three thicknesses, the two outer faces being vertical and the inner one horizontal. The boards were in about 6in. widths, and securely nailed together with 3in. clasp nails and clinched on the outside; the total thickness was 2⅝in. Each door was hung with one pair of strap hinges 2ft. 6in. long into brick rebates, and before the doors were put in position the rebates were screeded so that the doors should fit as close to the rebates as possible. These doors stood a longer test than the former series. Flame was not seen through the pine door till sixty minutes, although in the deal door flame came through in thirty-nine minutes. The destruction of the doors was very rapid after the fire came through, and at sixty-five minutes the test was concluded. The iron was the ruin of the doors, as when the nails and bolts became red hot they charred the timber around them and allowed the fire to come through.

Doors in Three Thicknesses Secured by Pins.

This led the Committee to test three doors of similar construction to the last, *i.e.*, in three thicknesses, but the thicknesses were secured together by ⅜in. double wedge-shaped pins, driven in from both sides, instead of clasp nails. These doors had frames, and the frames were splay rebated. The three doors were respectively of deal, teak and oak. The test with these doors gave the best results of any of the previously tested fire-resisting doors.

The deal door of this construction was tested against a four-panelled teak door, with the result that at the end of sixty minutes the teak door was almost consumed, but the deal door was practically intact as a fire stop, and at sixty-five minutes presented a good appearance while the teak door was all gone. The oak and teak door of the same construction as the deal door were still in position after seventy-five minutes, the teak one being the better of the two.

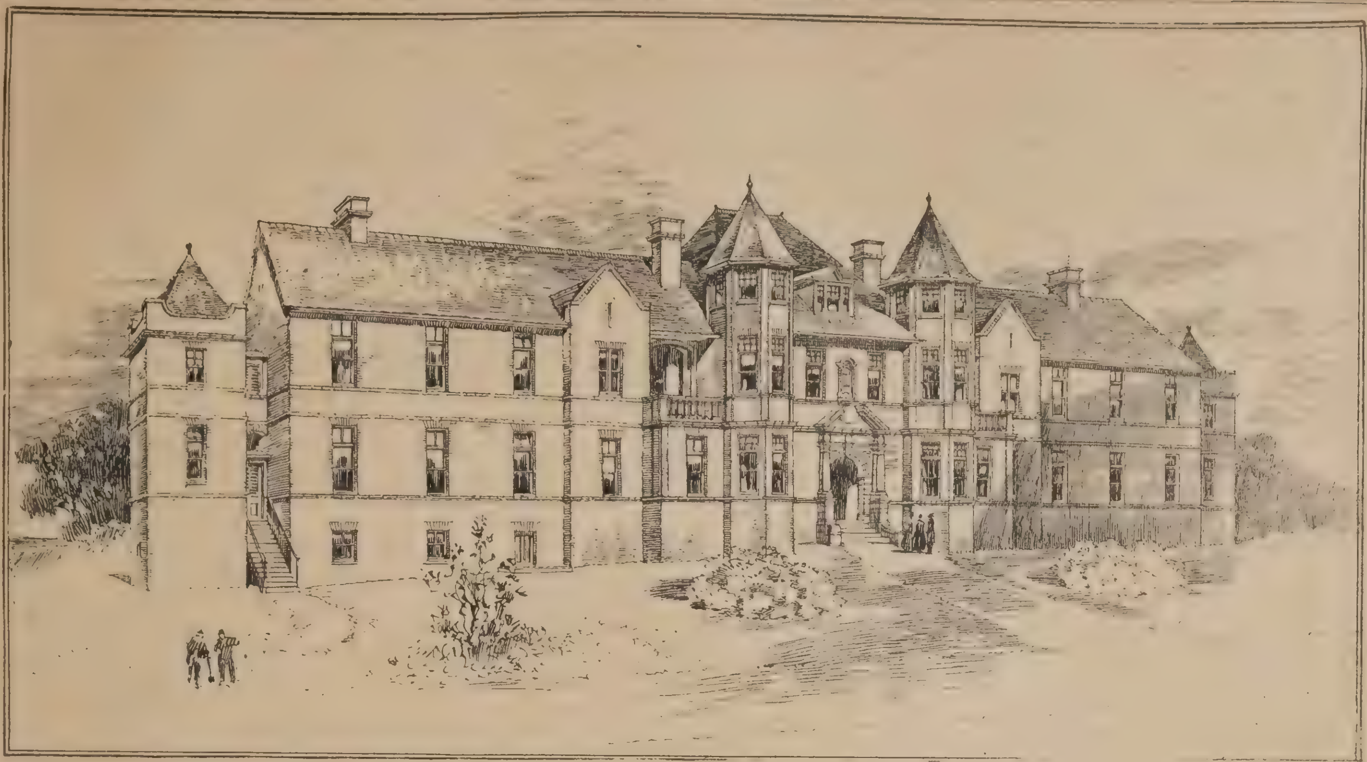
An Armoured Door.

This ends the series of tests with fire-resisting doors, and we come now to a comparative test with an iron door meeting the requirements of the Building Act under section 77, and a door constructed of wood and encased with tinned steel sheets, lock jointed and screw nailed. The test was to be one hour, and the summary is as follows: The wood door covered with tinned steel plates remained in position, but was much buckled and bulged, and the upper part gradually inclined inwards to a considerable extent, permitting the passage of flame. The first spurt of flame over the top of door was seen after five minutes. The iron-framed and panelled door remained in position, but became red hot, buckled and warped considerably, together with its rebated frame. The upper corner on the lock side gradually inclined inwards to a considerable extent, permitting the passage of flame. The first spurt of flame between door and frame was seen after twenty minutes. Notwithstanding that the iron door buckled, I am of opinion it is the best fireproof door at present in use, but to be effective it requires three hinges and three bolts, and the tendency to buckle is thus hindered. At a big fire recently I had the opportunity of observing the behaviour of a pair of doors fastened with three bolts, and the result was that while the building on the fire side was entirely destroyed, the iron doors prevented the flame spreading to the adjoining section.

Protective Coverings for Windows.

Under the fourth head of my subject I now come to protective coverings to windows or forms of glazing which in themselves resist at least for some time the action of fire.

For purposes of comparison the Committee instituted a test to arrive at the time the ordinary methods of glazing succumb to the action of fire. Three casements of teak were set up in a hut upon a dwarf wall; one casement was glazed with lead lights, one with ¼in. thick plate glass, and one with 32oz. sheet glass. Within six minutes flame burst through the 32oz. sheet-glass casement, and half the sheet had fallen. The other half fell within twelve and a half minutes. Within seven minutes the lead glazing had collapsed. Within twelve minutes flame burst through the ¼in. plate casement, and within fourteen minutes the whole sheet had



DORKING INFIRMARY. H. PERCY ADAMS, ARCHITECT. EXHIBITED AT THIS YEAR'S ROYAL ACADEMY.

fallen. The highest temperature was about 1,500 degs. Fahr.

A Test with Three Teak Casements.

The Committee had submitted for test three teak casements similar to the last, but glazed with copper electro-glazed sheets of prismatic glass in 4in. squares and $\frac{3}{16}$in. thick. The testee desired a thirty minutes' test with a temperature gradually rising to 1,000 degs. Fahr. Water was to be turned on to the outside of the glass for a period of two minutes at the expiration of fifteen minutes, and at the expiration of a further period of fifteen minutes water was to be applied on the inside for three minutes. The result of the test is thus recorded: After twelve minutes the whole of the glazing commenced to bulge inwards to the extent of 1in., 1½in. and 2½in. respectively. After twenty-one minutes the top portion of the centre casement sagged and left a space between the glazing and the teak frame; 317 squares out of a total of 324 withstood the action of the fire and water, and except for stars and cracks, the remaining seven squares were broken and had pieces out.

A further test on the same lines was undertaken, with the difference that the glazing was with small sheets of plate glass 4in. by 4in. by $\frac{3}{16}$in. thick, copper electro-glazed. The test was to be for forty-five minutes, with a temperature of 1,300 degs. Water was to be applied for two minutes on the outside at the expiration of twenty minutes, and for two minutes on the inside at the expiration of the following twenty-five minutes. The glass in the casements after the first application of water was not displaced. In thirty-five minutes the glass in the north casement fell inwards, and in thirty-six minutes the same happened to the centre one, but that in the south casement remained in position till the end of the test, although damaged at the top.

Another test on the same lines in which the casements were glazed with rolled wired plate glass ¼in. thick. The testee desired forty-five minutes' test; water was to be applied after thirty minutes for one minute on the outside, and again at the expiration of the test. The result was that in twenty-eight minutes the outside of the teak casements took fire. In thirty minutes the glass in the centre casement begun to buckle and let the flames through. In thirty-four, thirty-seven and forty-nine minutes respectively the glass in the three casements began to bend either outwards or inwards, and at the conclusion the glass in the three casements was unbroken, but fused and doubled up into various shapes. This series of tests shows that at least for a time glass may assist as a fire stop.

Skylights glazed with copper electro-glazed squares of prismatic glass, and also wired glass, were also tested, each for thirty minutes; the fire did not pass through the latter.

Fire-Resisting Blinds.

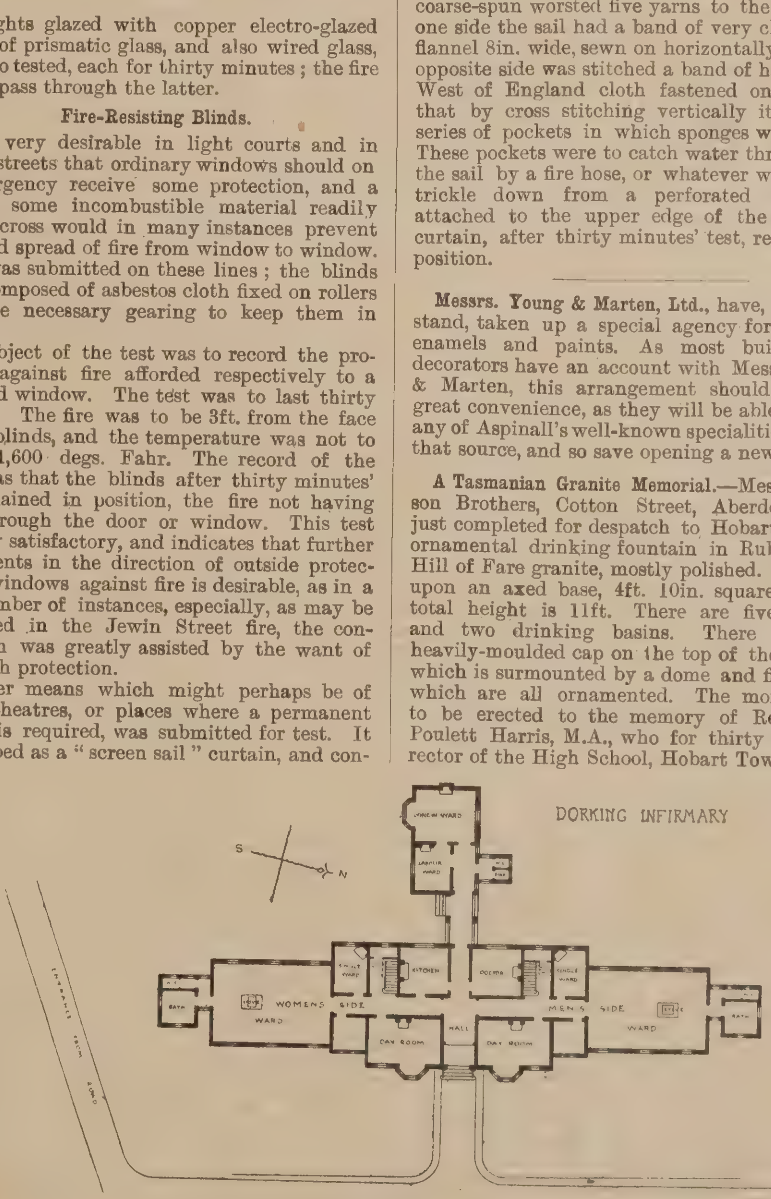
It is very desirable in light courts and in narrow streets that ordinary windows should on an emergency receive some protection, and a blind of some incombustible material readily drawn across would in many instances prevent the rapid spread of fire from window to window. A test was submitted on these lines; the blinds being composed of asbestos cloth fixed on rollers with the necessary gearing to keep them in position.

The object of the test was to record the protection against fire afforded respectively to a door and window. The test was to last thirty minutes. The fire was to be 3ft. from the face of the blinds, and the temperature was not to exceed 1,600 degs. Fahr. The record of the effect was that the blinds after thirty minutes' test remained in position, the fire not having come through the door or window. This test was very satisfactory, and indicates that further experiments in the direction of outside protection to windows against fire is desirable, as in a large number of instances, especially, as may be mentioned in the Jewin Street fire, the conflagration was greatly assisted by the want of some such protection.

Another means which might perhaps be of use in theatres, or places where a permanent curtain is required, was submitted for test. It is described as a "screen sail" curtain, and consisted of woollen material woven of treble-laid coarse-spun worsted five yarns to the inch. On one side the sail had a band of very close-woven flannel 8in. wide, sewn on horizontally. On the opposite side was stitched a band of hard woven West of England cloth fastened on slack, so that by cross stitching vertically it formed a series of pockets in which sponges were placed. These pockets were to catch water thrown on to the sail by a fire hose, or whatever water might trickle down from a perforated hose pipe attached to the upper edge of the sail. The curtain, after thirty minutes' test, remained in position.

Messrs. Young & Marten, Ltd., have, we understand, taken up a special agency for Aspinall's enamels and paints. As most builders and decorators have an account with Messrs. Young & Marten, this arrangement should prove of great convenience, as they will be able to obtain any of Aspinall's well-known specialities through that source, and so save opening a new account.

A Tasmanian Granite Memorial.—Messrs. Simpson Brothers, Cotton Street, Aberdeen, have just completed for despatch to Hobart Town an ornamental drinking fountain in Rubislaw and Hill of Fare granite, mostly polished. It stands upon an axed base, 4ft. 10in. square, and the total height is 11ft. There are five columns and two drinking basins. There is also a heavily-moulded cap on the top of the columns, which is surmounted by a dome and fine finials, which are all ornamented. The monument is to be erected to the memory of Rev. R. D. Poulett Harris, M.A., who for thirty years was rector of the High School, Hobart Town.



CHRIST'S HOSPITAL.

THE GOVERNORS' DEFENCE.

MR. W. VAUGHAN MORGAN, the treasurer of Christ's Hospital, which is threatened with destruction in order that certain funds may be raised, has set up the following defence for the Governors.

When, by a scheme of the Charity Commissioners sanctioned in 1890, the Governors found it imperative that a move should be made, they acquired a site at Horsham, in Sussex, and proceded to erect a new boarding school for boys. The cost involved in this operation, though cut down in every possible way, amounts to no less than £550,000. The building approaches completion, and will be ready to receive the boys in the spring of next year.

"The Governors were advised," says Mr. Vaughan Morgan, "and the Charity Commissioners concurred in the advice, that the realisation of the City site should be postponed as long as possibie, in the belief that a better sale would result. That this site has from the first been been regarded as a source from which the money was to be found to carry out the scheme is common knowledge. The valuable character of the site was, indeed, the main justification for the compulsory removal of the school from London.

"There was and is no alternative for the Governors, forced as they have been to establish new schools elsewhere, but to take the step of realising the site. The time for this has now come, and the answer to objectors who would hinder or stop the sale is that they should have joined with the old Governing Body in resisting the scheme when that scheme was before Parliament eleven years ago; and that it is too late now to talk of preserving the old school buildings unless someone—be it the London County Council or other public body—is prepared to find the money now called for. Of course, if the Governors should be relieved by Parliament from the obligation to provide these latter schools, then the financial requirements would be correspondingly abated; but the Governors being bound by Parliament to provide and maintain these schools, are equally bound to use their best endeavours to realise the site to the best possible advantage.

The Buildings Themselves.

"The Governors are the last persons to deny that historic interest attaches to the site of their institution, and heartily join in the common regret that the removal of the school should involve also the removal of the buildings hitherto used for school purposes. It is a mistake, however, to suppose that the buildings on this site, interesting as they may be, are historical in the ordinary acceptation of that term. The principal of them emanate from no earlier date than that of George IV. The Great Hall, so often confused with the earlier building which the present one displaced in 1825, was built from the plans of the Hospital's architect, the late Mr. John Shaw. And as to the court room, to which the Society for the Protection of Ancient Buildings refers, and which the Governors themselves would naturally much like to preserve if it were possible, it is the room itself which is attractive, as the exterior can hardly be described as beautiful. The building was erected in 1680, and enlarged in 1788.

"The only really ancient piece of building on the site consists of some thirteenth-century arches, rapidly crumbling to decay, which were retained in the reconstruction in 1682 of one of the dormitories over the south cloister. These arches probably formed part—and the only remaining part—of the Grey Friars' Monastery, and will be carefully taken care of with a view to removal to some suitable spot, as will also any other antiquarian and interesting objects which may come to light during the removal. As some of the opponents represent Open Spaces Associations, it may be well to state that the plans of a century ago show that nearly all the ground now used as playground was formerly covered with buildings, and the only portion which has not been built on is the quadrangle and a part of the treasurer's garden.

"The ratepayers, after all, are concerned in the matter; it is they who nowadays have to find the means for technical and secondary education, and the site of Christ's Hospital is an endowment applicable and now dedicated to this purpose. The general public have, therefore, a direct interest in the sale of the site of Christ's Hospital producing the largest sum possible."

THE SOCIETIES' REPLY.

Mr. Lawrence W. Chubb, the secretary to the conference of societies with regard to this matter, makes the following reply to the Governors:—

"The Governors assume it to be proved that it is impossible to carry on the schools of the Hospital in accordance with the scheme of 1890, without sacrificing the whole of the Newgate Street site, and throwing it into the building market without conditions of any kind—indeed, relieved of conditions which would otherwise prevent its being built over.

"This may or may not be true. It has not yet been shown to be so. The Governors are a distinguished and public-spirited body; but it is hardly fair that in a matter of so great importance to London they should be judges in their own cause. They come to Parliament for power to build over their own property. Parliament has before it no materials on which to judge of the necessity of such a step, no accounts, no information as to the expenses, past and future. of carrying on the school, no statement of the possessions and income of the Hospital. The income of the Governors in 1870 was £70,000; they must have a good deal left even after spending what they have at Horsham. Before the destruction of a feature of London of surpassing interest is sanctioned, it seems not unreasonable to ask that a full report from some responsible tribunal, made after a public enquiry, should be in the possession of the Legislature.

The Thirst to Sell.

"The Governors themselves lament the course to which they are impelled, and suggest that some public body should buy the site at its full value. But all the evidence points to a disinclination on their part to utilise the site for public purposes, and a positive thirst for the auction mart or the building syndicate. St. Bartholomew's Hospital is willing to pay more than full building value for the northern part of the site, for they have introduced a Bill for its compulsory purchase; yet the Governors of Christ's Hospital oppose the Bill. It is admitted that two day-schools should be established on the foundation of Christ's Hospital within three miles of the Royal Exchange. What more central site than Newgate Street could be suggested? Yet the Governors will not entertain the idea of adapting any of the existing buildings for such a purpose. Again, the Governors must have offices, a court-room for their weekly meetings, and possibly a hall for the entrance examinations of their boys and girls. But they do not seem to have thought of the possibility of retaining their present court-room, and would actually, it seems, hire or buy other premises for these necessary purposes. If time were allowed, other public uses might not improbably be found for the whole or portions of the site. But the Bill of the Governors alludes to actual negotiations, and there seems to be no question that, if passed in its present form, the property will be sold as an unoccupied site at a price per foot, and be devoted wholly to commercial purposes.

Apropos the Architecture.

"Although lamenting the destruction of their buildings, the Governors rather ungraciously attempt to belittle their interest. No one has suggested that the Great Hall is ancient; but it is a very fine hall nevertheless, as any one may judge who will obtain admission to the organ gallery and watch the boys at their midday meal. It may no doubt be true that little of the existing buildings has survived from pre-Reformation times; but the Governors themselves refer to the reconstruction of 1682, and tell us that their court-room was built two years earlier. Wren was then in his prime, and many persons will be of opinion that his buildings and those of his school can be as badly spared as the buildings of any earlier epoch. A few steps up Christ Church passage will disclose a beautiful facade of Wren's work, disfigured only by the vandalism of the Governors, who have recently torn away the end of the building and the effigy of King Edward.

"The Governors think it is an answer to the statement that a large area of open space will be lost to London to say that most of the playground was formerly covered with buildings. Whether this is so or not seems of very little importance. Long before London took its great growth—for it was a comparatively small place even fifty years ago—the present playground and garden existed. They have kept the heart of the City sweet, and if they cease to exist the whole of London will be the poorer. Moreover, it is admitted that the area known as the Ditch, the old 'Garden' of the Grey Friars, which has maintained its name to the present day, and the Treasurer's Garden are open spaces of immemorial age. The preservation of this area alone would be of inestimable value.

Governors cannot Blow Hot and Cold.

"Finally, it is sought to explain away the very fact which has necessitated the present application to Parliament. But the Governors cannot blow hot and cold. Their Bill seeks to give them authority to sell the site freed and discharged from any restrictions (statutory or otherwise) which may affect the same by reason of any part or parts thereof having been used or set apart for purposes of interment, or consecrated. If no part of the ground came within the Acts which forbid building on disused burial-grounds, the proposal of the Bill would have no meaning. The mere removal of human remains can be accomplished under the authority of the Home Secretary, and is no sufficient ground for the Bill.

"This is not a question which should be decided hastily and on *ex parte* statements. Great profits are a tempting bait, even for a charitable foundation. It should be ascertained beyond doubt that it is not the mere wish to handle large sums of money which impels the Governors to the course they now propose.

"London will lose irreparably if Christ's Hospital as it now exists is replaced by shops and warehouses. The foundation is a very wealthy one, and it should be called upon to show how it makes out the necessity for such a disaster."

At last week's meeting of the London County Council it was decided to oppose the Bill (see p. 269 of this issue).

ST. GEORGE'S CHURCH, LEEDS.

AFTER being closed for many months, during which period it has undergone extensive restoration, the church of St. George's, Leeds, has just been reopened. The whole of the old "box" pews on the ground floor have made way for seats of polished pitch-pine, while the electric light has been substituted for gas. The old flat plaster ceiling has been removed, and an open-timbered roof of stained pitch-pine substituted. Another important work has been the breaking through of the east wall, the insertion of a lofty chancel-arch of stone and the erection of an apse with wall arcading and five lofty traceried windows, a new clergy vestry being built on the south side of the apse. The entire area of the church has been covered with a layer of concrete 6in. thick, and a new wood-block flooring has been laid down. The chancel has been enriched by elaborate oak choir-stalls, oak clergy-stalls with carved and traceried canopies, and an octagonal pulpit of oak, with canopied niches containing figures of the Evangelists at the corners. A fine old painting by Cope occupies a position on the wall of the new apse. There is a new holy table of carved oak. The space under the tower now forms the baptistery. A new oak screen, forming a lobby, with traceried panels and folding doors, has been added. A new gallery front in open pitch-pine has been erected, and a new heating apparatus introduced. The organ, thoroughly overhauled and added to, has been refixed entirely on the gallery floor. The estimated cost of the restoration is £7,500. The structural alterations, including the apse and the roof, are from the designs of Mr. Henry Walker, architect, of Leeds; the interior screen work, stalls, pulpit, gallery front, &c., are from designs by Mr. G. H. Elliot, of Lightcliffe, under whose supervision the whole of the work has been carried out.

THE CASTELLO AT MILAN.

A WONDERFUL BUILDING.

MILAN is just now full of travellers passing to or from Rome and the Riviera, and a fair proportion of these are careful to see the leading sights of the city.

"But," says a correspondent of the "Times," "there is one sight which has not yet got into the guide-books, and which yet is so interesting that it ought not to be missed by anyone who cares for art and history, or by anyone who can take pleasure in one of the most ingenious and legitimate pieces of 'restoration' that the world can show.

"This is the famous Castello Sforzesco, the fortress-palace which the Sforzas built on the ruins of the older Visconti building, and which, after undergoing many sieges, many partial attempts at destruction, and the neglect of centuries, is now in a fair way to recover, almost completely, the form and outward beauty of its prime. One of the inner courts is finished, and here have been arranged all the treasures of the old Museo Civico and many others; the other court, the frowning Rocchetta, is rapidly nearing completion; and the more extensive rebuilding required by the forecourt is proceeding, and will probably be finished in three years.

"The whole may be said to be the work of one man, Signor Luca Beltrami, the architect, a man still young, but one who has already devoted fifteen years of his life, first to persuading the people and the Municipal Council of Milan that the restoration of the ruin was feasible, and then to carrying it out, with an ability and a success that are little short of marvellous.

"The largest, finest and historically most celebrated of the castles built by the despots of the Renaissance has been recovered, and a multitude of relics of the past of Milan and of Lombardy have been stored within it.

Signor Beltrami's Principle.

"The principle followed by Signor Beltrami, to whom the chief direction of the work was confided, appears to have been this: Where restoration was a matter of absolute certainty there should be restoration, but in all other cases things should be left as much as possible in the state in which they were found.

The Frescoes.

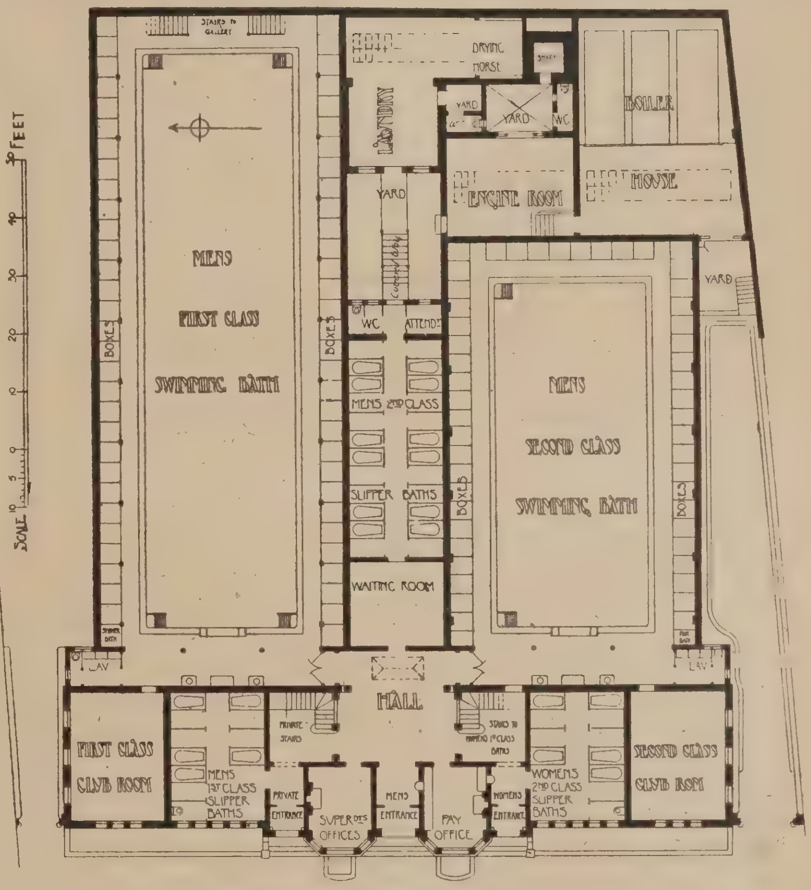
"It is scarcely necessary to say that of the fresco painting which was the glory of the Castello in the time of Ludovico il Moro very little remains, and that no attempt has been made to 'restore' here. The two most interesting frescoed chambers are the chapel and a little room which the enthusiastic *custode*, following a somewhat dithyrambic German writer who ought to have known better, calls the study of Lionardo da Vinci. . . . . The decorations of the chapel, though mere shadows and fragments of what they once were, are of extreme interest. A series of indications—little more—of single figures of Saints, a few feet apart, have been discovered all round the building—the work, as documents prove, of the painter Montorfano and other Lombard artists who worked before the advent of Lionardo. The originality of the decoration consists in the square tile-like pattern, worked in stucco in very low relief, which forms a background for the figures. It is the sort of work which would have delighted the soul of Burne-Jones, who would have realised the extraordinarily rich effect which might have been obtained from it.

Sculpture.

"The rooms that are already finished, in and about the Corte Ducale, already form a museum of no small importance. The first room contains a number of Roman and pre-Roman remains, not without importance to the archæologist; in the central loggia is the fine fourteenth-century monument of Barnabo Visconti (A.D. 1380); and fixed in a neighbouring wall is the magnificent doorway which was sculptured by Michelozzo for the Medici bank in Milan. This fine work dates from nearly a hundred years later, and is therefore an example of the best period of Renaissance design; it was acquired not long ago by public subscription, to save it from the danger of destruction. In the rooms to the right are a large number of examples, most of them mere fragments, but some comparatively complete, of sculpture from 1400 to 1550 . . . . The chief artists represented in these rooms are Amadeo, who did such splendid work at Certosa and at Bergamo, and the sculptor called Bambaja, the fragments of whose unfinished masterpiece, the tomb of Gaston de Foix, are now here, after undergoing many and deplorable vicissitudes . . . . An adjoining room contains a number of examples, fragmentary but still interesting and likely to be of practical use to the Lombard builders and architects of the future, of the beautiful terra-cotta ornaments which are such a characteristic feature of Lombard architecture."

PLAISTOW PUBLIC BATHS.

ON Thursday last the new public baths at Plaistow, E., erected from the designs of Mr. A. Saxon Snell, F.R.I.B.A., were opened by Councillor Abednego Bishop, J.P., Mayor of West Ham. We give on this page a plan of the baths, and, as centre plates, illustrations of the exterior and interior.



PLAN OF NEW PUBLIC BATHS AT PLAISTOW, LONDON, E.
A. SAXON SNELL, F.R.I.B.A., ARCHITECT.

In so extensive an area as that embraced by the Borough of West Ham, it was obviously impossible to provide one set of baths, however large, which could be conveniently placed for the needs of the whole borough. It was therefore thought desirable to build a separate set in each of the two great divisions of the borough—Plaistow and Stratford. The present buildings are therefore only part of the general scheme. They are built upon the site of the garden of No. 40, Balaam Street, one of the oldest houses in the district.

Before committing the borough to any scheme, a committee of the council visited and inspected a number of the latest and best types of public baths in the Metropolis, including the large baths and wash-houses at that time just completed for St. Marylebone Parish by Mr. A. Saxon Snell. A contract was entered into with Messrs. Spencer, Santo & Co., Ltd., of Westminster, for the erection of the building at a cost of £22,308, and in May, 1889, the foundation-stone was laid.

The establishment comprises first- and second-class swimming baths, twenty-seven warm baths, and the usual towel laundry and boiler-house, &c. The main entrance is in the centre of the Balaam Street frontage, and leads to a large waiting hall, itself giving access to the various departments. This entrance will be used by both first- and second-class male bathers, and, as well as the hall, is overlooked by the superintendent's office on one side and the pay-office on the other. On the south side of the pay-office is another separate entrance for women, from which access is obtained to the first- and second-class warm baths and to the second-class swimming bath, when it is desired to use it for women. On the north side of the superintendent's office is the private and committee-room entrance. On either side of the main hall are respectively the first- and second-class swimming baths, and between the two, and approached by a special waiting room, are twelve second-class warm baths for men. The first-class men's baths (five) are on the ground floor in front of the first-class swimming bath. The second-class women's baths (five) are in a similar position with respect to the second-class swimming bath, the first-class women's warm baths being immediately above and approached by a specia staircase. The staircase on the north side leads to the board-room and private apartments. The first-class swimming bath is 100ft. long by 27ft. wide, with a depth ranging from 3ft. 6in. to 6ft. 6in. On two sides are arranged sixty-one dressing boxes. Lavatory basins and a special shower bath are also provided. A wide gallery runs round all sides, and is approached from the staircases at the end of the bath hall as well as from the main staircase. A large club room is attached, fitted with lockers and other conveniences. The hall walls are lined up to the gallery level with white-glazed tiles, and above the gallery with white-glazed bricks, relieved with coloured bands. It is lighted by an extensive lantern and skylights. There are two diving-boards. The bath itself is lined throughout with white-glazed tiles and relieved with coloured bands and ornamental tiles. The footways are laid with vitreous mosaic, with a slate border all round. The second-class bath is 60ft. by 27ft., with a depth ranging from 6ft. to 3ft. Round three sides are ranged fifty-one dressing boxes, and a special foot bath, and lavatories are also provided. A short but wide gallery is placed at the west end only. The hall walls are faced with white-glazed bricks to the height of the dressing boxes. The bath sides are lined with white-glazed tiles, and the bottom with white- and blue-glazed bricks. The footways are paved as described for the first-class bath. The warm baths generally are placed in cubicles formed with enamelled slate divisions and doors, and fitted with porcelain enamelled baths, and special hot- and cold-water fittings, controllable only by the bath attendant. Hot and cold showers are also provided. In the first-class bath-room the floors are laid with vitreous mosaic, and the second-class with patent paving. In the rear of the second-class bath are the towel laundry (fitted with power-driven machinery and steam-heated drying horses), an engine-room in which is placed a small Tangyes' engine, and a boiler-house fitted with two Galloway double-flued boilers. A large coal store has been constructed under one of the footways of the second-class bath. The engineering works have been executed by Messrs. Rosser & Russell, of Charing Cross. The late Mr. James Brooks acted as Clerk of Works for the foundation, and Mr. W. C. Gardner for the superstructure.

R. I. B. A.

ANNUAL GENERAL MEETING.

THE annual general meeting of the Royal Institute of British Architects was held on Monday evening last.

The annual report referred to a number of matters which have already been reported in these columns, such as the King's continuance of the grant of an annual gold medal, the results of examinations, awards of prizes and studentships, the General Architectural Congress held last June, &c.; so that there is now no need for us to recapitulate.

The Institute at present has 1,696 members on its roll, an increase of eighteen over 1900.

During the past year twenty-nine Fellows have been elected, forty-six Associates, three Honorary Associates and one Honorary Fellow. Two Honorary Corresponding Members have been elected, J. Antoine Bouvard (Paris) and J. G. Pedro d'Avila (Lisbon).

The Council attribute the smallness of the increase in membership in the class of Fellows to the more than usually heavy losses by death, by resignation, by transference to the class of Retired Fellows, and by other removals from the list. There have been only three special elections to the Fellowship by the Council under the new proviso to by-law 9, as compared with eleven last year and twelve the year before. On the other hand, the ordinary elections to the Fellowships by the general body have been twenty-seven, as against twenty-one, fourteen, and eight respectively in the three preceding years.

The losses by death have been as follows: Fellows: Charles Barry, H. C. Boyes, J. Burnet, J. Butler, F. Chambers, Henry Currey, C. H. Driver, W. C. Evans-Vaughan, Joseph Goddard, Horace Gundry, E. J. Hansom, T. Harris, W. Hepper, N. E. Jennings, T. M. Lockwood, W. H. Powell, J. M. Robertson, Lloyd Taylor, J. Buckley Wilson, W. Young. Associates: J. W. Blakey, F. Borham, H. G. Wade. Retired Fellows: H. A. Darbishire, W. M. Teulon, J. J. Thompson. Honorary Corresponding Members: Giuseppe Poggi, Antoine Henri Revoil, Jules Jacques van Ysendyck.

The total number of candidates examined during the year was 600, as against 548 in 1900. The number of Probationers of the Institute now stands at 1,507, and Students at 368.

The "special" examination will be held this June in Sydney and Montreal.

The Fifth International Congress of Architects was held at Paris during the week commencing July 30th. The Institute was represented by Professor G. Baldwin Brown and the secretary. The Sixth Congress will be held in Madrid in the spring 1903.

The Council were invited by the Glasgow International Exhibition of 1901 to contribute to the Fine Art Section an exhibit from the collections of the Royal Institute, a bay in one of the galleries being placed at their disposal. The Council have complied with the request, and have sent the portraits of Professor Cockerell, Sir Gilbert Scott and Mr. F. C. Penrose; marble busts of Inigo Jones, Sir Christopher Wren, Sir Charles Barry and George Edmund Street; and a large number of drawings.

The Council have acceded to the request of the Glasgow Institute that the R.I.B.A. annual dinner shall be held this year in Glasgow. It will take place on Thursday, October 3rd. An interesting programme has been drawn up for the visit, and the Corporation of Glasgow have kindly arranged to entertain the Royal Institute at a reception on Friday evening, October 4th. The Council most earnestly hope that as many members as possible will attend, so as to ensure the success of the gathering.

The Holborn-to-Strand Scheme: What the Council Did.

The Council were asked by the London County Council to co-operate in the Holborn-to-Strand Improvement Scheme, and a deputation waited on the Improvement Committee to protest against the proposed conditions. They suggested that there should be a competition among the eight architects, and that three should be chosen to carry out specified blocks, working together, however, as a consultatory committee on the whole scheme. The interview resulted in a few modifications in the conditions as to the details of drawings required and an increase in the honorarium offered to £250. The Council were given to understand that there could be no guarantee that any of the eight architects should execute all or part of his design, and the invitation to co-operate was renewed on the slightly modified basis. Desirous of aiding the London County Council in their efforts to secure architectural treatment for the new street, the Council accepted the invitation under strong protest, and nominated four architects. Their names were Messrs. Reginald Blomfield, T. E. Collcutt, Ernest George and R. Norman Shaw. Two of them, Messrs. Collcutt and Shaw, declined the nomination. The Council were requested to nominate two others in their place. In view of the London County Council's disregard of their protest accompanying the original nomination, the Council considered that they had gone as far as was consonant with the dignity of the Institute, and the profession which it represents, to meet the wishes of the London County Council, and formally declined to make further nominations.

The London County Council also submitted for the opinion of the Council their draft by-laws under the Metropolitan Management Acts, as to the disposal of plans with reference to pipes, drains and other means of connecting with sewers. The main suggestion of the Council was that in lieu of elaborate duplicate plans and sections, which it was proposed that any one about to construct or reconstruct drains, &c., should deposit with the sanitary authority, it would be sufficient if one carefully-prepared block plan were sent.

The Council have also adopted the report of the Science Committee with regard to a scheme suggested by the Plumbers' Company for the hall-marking of plumbers' work, and they have arranged with the Plumbers' Company for a conference to be held between the company, the Royal Institute, and the Water authorities with a view to settle the best kinds of materials and forms of fittings used in plumbers' work, and to provide a basis for regulations on the subject.

The Council regret that their negotiations with the Institute of Builders, extending over a space of two years, have come to a fruitless conclusion.

The Joint Committee of the Institute and the Surveyors' Institution respecting ancient lights have been authorised to draft a public Bill on the lines of their report, and to submit it for consideration to the two Councils; the Bill is now in the hands of a Parliamentary draughtsman.

The Council have reappointed Mr. Thomas W. Cutler as the representative of the Institute on the Sanitary Inspectors' Examination Board. At the Congress of the Royal Institute of Public Health, to be held at Eastbourne in July, Mr. Herbert Spurrell has consented to represent the Institute. Messrs. Alexander Graham and Edwin T. Hall will represent the Institute at the British Congress on Tuberculosis to be held in London this year, also in July.

The Council recommend to the attention of members the Architectural Museum, Tufton Street, Westminster, which is somewhat in need of funds for purposes of repairs, maintenance of the 4,000 casts of examples of Gothic work, and the purchase, if possible, of casts of Classic and Renaissance examples. They feel that the support of the profession at large is deserved by a most valuable institution, whose foundation and maintenance have been the devoted work of a few men. The Council have decided to make the museum an annual grant of twenty guineas, provided they are adequately represented on the committee of the museum.

The question of architects' names appearing on advertisement boards has come before the Council, and they have issued a resolution to the effect that the signing of an architect's name on his building is not derogatory to the profession, but that "it is undesirable for architects to place their names on boards and hoardings in front of buildings during course of construction for purposes of self-advertisement." The Council earnestly hope that members will co-operate with them in making this resolution as effective as possible.

The Council take this opportunity of drawing attention to the needs of the Architects' Benevolent Society, and express the hope that the names of more members of the Institute will appear in the list of subscribers.

The balance-sheet of the Institute shows the sum of £843 19s. 3d. on the right side. The estimate for the year ending December 31st next shows a balance of income over expenditure of £1,100.

In their report the Literature Standing Committee announce that since the date of the last report eleven original drawings, attributed to Inigo Jones, have been discovered by the librarian in the collection of the late Anthony Salvin. These have been carefully mounted under the direction of Mr. R. Phené Spiers.

The Practice Standing Committee say in their report that, as anticipated, the revision of the Institute pamphlet on "Dilapidations" has been found to necessitate the creation of virtually a new book. This has been divided into chapters, each under a definite heading. Several of these chapters are completed, and the remainder are in hand. The Committee hope to send the new book in proof to the Council before the end of this session.

The Science Standing Committee report that the results of the experiments for the purpose of ascertaining the strength of different kinds of brickwork will, it is hoped, be issued shortly in pamphlet form. At the request of the University of California, Berkeley, U.S.A., whose College of Chemistry has arranged a special course on the chemistry of structural materials, specimens of stone, brick, and mortar of known age, ancient as well as modern, were collected and forwarded to the College, and the results of the analyses will be duly communicated to the Institute. The supporting power of rocks and soils is still under enquiry. The Committee are collecting particulars from various sources.

After the annual report had been adopted, Messrs. Hippolyte J. Blanc (Edinburgh), C. Fitzroy Doll (London), and E. H. Sedding (Plymouth) were elected Fellows, and Mr. R. Douglas Wells (London) was elected Associate.

A New French Bridge.—The French Minister of Public Works has approved the designs for a steel railway bridge, which will be the highest in the world. It will span the valley of Sioule, on the line in construction from Saint-Eloy to Pauniat, in the Allier, Central France. The trestle construction is adopted, the total length being a little over 400yd., divided into three spans by two piers of masonry 300ft. high. The height of the rails above the centre of the valley is 435ft. The bridge will cost £112,000.

Protection of the National Gallery against Fire.—Sir Edward J. Poynter, in his report, calls attention to the lessening of the danger to the National Gallery by fire. The water pressure on the roof has been increased. Steps have been taken for the purchase of contiguous business premises, and it is hoped that the isolation of the gallery may be effected in a reasonable time.

BRICKMAKING IN HUNGARY.

CONSIDERABLE attention has, during the past few years, been drawn to Hungary by the internal dissensions in the Austrian Parliament at Vienna and the constant differences arising between the two foremost provinces (Austria proper and the kingdom of Hungary) which combine to form the backbone of the monarchy. Thus, politically, Hungary has become exceptionally well known to the world in general. In an industrial sense, however, it may with assurance be claimed that the knowledge of the public concerning the affairs of this growing young country, lying on the boundaries of the outposts of Orientalism, is limited.

Vienna and Budapest.

Hungary's continuous opposition to the rule of Austria, as laid down by the Viennese Parliament, has to one possessing a knowledge of the nation's resources and strength, the semblance of a young giant's protest against the arbitrary sway of a weakling. For in strength and power Austria proper is rapidly growing to look puny in comparison with the budding forces of Hungary. While Vienna fails to advance either in the size of its population or in the importance of its industries, Budapest is springing ahead with leaps and bounds. The latter city is called the "Chicago of Europe," because it is said to have come up in a day. Vienna introduced a system of electric traction two years ago; Budapest did this six or eight years ago. The streets of Vienna are still poorly lighted by gas; Budapest is nightly illuminated by as fine a system of electric lighting as can be found anywhere in Europe.

To continue the comparison to another important feature, namely, building, Vienna builds slowly and laboriously, whereas in Budapest fine structures rise with the rapidity of skyscrapers in the United States. In Vienna, when a building projects so far into a street as to interfere with traffic or with street improvements, it is torn down and rebuilt. Budapest hires a building-mover from Chicago and moves palaces, stores, residences and anything else that may be required.

These are only a few instances of the push and energy evinced by the Hungarians in their municipal affairs. Similar conditions apply to all branches of their industries and commerce in general. Austria taxes her industries to the fullest extent possible, while Hungary stands ready and willing at all times to facilitate the establishment of manufactories by the granting of special inducements, such as exemption from taxation, low gas and water rates, and the score of other privileges which it is in the power of Governments to grant for special purposes.

This condition of progress renders the brick industry of Hungary of peculiar interest at present, especially as the various cities of the kingdom give evidence of a yearly increase in the demand for building materials reaching well into the millions.

The Main Centre

of the brick industry of Hungary is situated in the district immediately adjacent to Budapest. In this locality are the principal plants, amounting altogether to the considerable number of twenty-seven. As far back as 1897 the total annual production of these plants was 400,000,000 bricks, which amount increased in 1898 to 500,000,000. In 1899, however, a reaction set in, and, through the depression of prices following a slight over-production, the total output dropped to two-thirds of the figures representing 1898, or a little over 300,000,000. Accompanying this loss in output came a drop in the prices to 21s. 6d. per 1,000, at which price it was difficult for the makers to realise the cost of production, without thought of profit. As a result, outputs were on every hand reduced, working forces were cut down and those kept by the plants were paid 16s. 6d. to 30s. a week—wages considered high in Hungary, but necessitated by the strike of the previous year.

Outputs.

The effect of the depression is perhaps best llustrated by the following outputs of various irms in 1899 as compared with the preceding year. In 1899 the Draschesche Kohlen-Bergbau and Ziegelei-Actien-Gesellschaft, one of the largest companies in Hungary, which produced in 1898, 82,000,000 bricks, was able to turn out in 1899 only 54,000,000, while the output of the Kobanyaer Dampfziegelei-Gesellschaft dropped during the same period from 50 to 25 million bricks, and the Ujaker Ziegel und Kalkbrennerei Actien-Gesellschaft turned out only 27,000,000 bricks, as against 35,000,000 in the previous year.

The production of the Dampfziegel-, Cement- und Gypsfabriken-Actien-Gesellschaft is also interesting. This company manufactured in the year 1898 37½ million bricks and 1,750 carloads of cement, as compared with 37,000,000 bricks in 1897, 27,500,000 in 1896, and 20,000,000 bricks and 1,200 carloads of cement in 1899. The condition of the provincial industry was also unfavourable in 1899. Not only was the total output considerably reduced, but the low price of 21s. 6d. prevailing in Budapest effectually closed the capital city as an outlet for inland-made bricks, and thus added the proverbial last straw to the Hungarian brickmaker's back.

A Much-needed Tonic.

According to reports which have emanated from Hungary during the past year, however, the increased demand for bricks during the current year has proved a much-needed tonic to the industry. The plants have been able to employ more labourers, and a considerable improvement in the prices has taken place. One of the leading companies in the kingdom, which had erected a new plant in 1898, for operation in 1899, has been able to turn out a very fair quantity, much against the general expectation of the trade. Wages also have improved, day labourers earning from 1·20 to 1·50 florins (2s. to 2s. 6d.) per diem, and piece-work men getting from 25s. to 36s. per week. That such good results were attained is due almost entirely to the circumstance that the building activity in Budapest, instead of abating, has not only steadily progressed, but offers bright prospects for the future.

Leading Plants.

The leading plant in Hungary at present engaged in the manufacture of bricks is the Draschesche Steinkhlen-und Ziegelfabrik Gesellschaft, in Budapest, which is equipped with facilities capable of turning out from 91 to 100 million bricks. Next in importance to this are probably the Kobanyaer Dampfziegelei, a concern fitted for an output of 50,000 bricks; the Ungarische Dampfziegel-, Cement & Gypsfabrik Actien-Gesellschaft (equipped for producing, if necessary, 45 million), the Ujaker Ziekel- & Kalkbrennerei (40 million), the Vereinigten Zingel & Cement Fabrik-Act. Gesellschaft, all of Budapest; the Kalocsaer Dampfziegelei Actien-Gesellschaft, in Kalocsa; the Erste Exporte Dampfziegel Deckziegel- & Keramische Fabrik-Actiengesellschaft, in Kecskemet; the Budapest Tegla es Meszege-togyar, the Lechner Rakosi Teglagyar Reszvenytarsasag, the Victoria Teglagyar, the Apatini Teglagyarak and the "Itvan" Teglagyar Reszvenytarsasag, all in Budapest. Besides these there are, of course, a score of minor-class works, whose titles are so difficult to read or pronounce that it is inadvisable to embody them in this article.

German Machinery.

The bulk of the plants that boast up-to-date equipments are operated by German machinery. There are some ten or twelve German manufacturers of brick machinery in the Hungarian market, all of whom have reaped good profits from their Hungarian trade. An idea of the exact value of Austria-Hungary as a market for foreign brick machinery may be gathered from the following statistics for 1899, recently published at Vienna. According to these the imports of brick machinery, which in 1897 amounted to 483,750 guldens (£38,700), rose in value in 1898 to 560,340 guldens (£44,829), and in 1899 to 822,330 guldens (£65,788). In 1899 Germany's share of these imports amounted to 804,240 guldens (£64,339), that of Great Britain to 4,680 guldens (£454), of Italy 450 guldens (£36), while the United States supplied in all 9,180 guldens (£734).

Owing to the fact that the statistics of Austria and Hungary are classed together, it is impossible to distinguish between them, but that Hungary's share is large is evident from the enormous growth that has taken place in the industry in recent years.

During the year 1899 stone-working machinery was imported to the amount of 21,230 florins, of which 14,300 florins worth was of German origin, 5,940 florins worth of Belgian origin, while the rest came from Switzerland and Great Britain.—From the "Clayworker" (Indianapolis, U.S.A.).

EXCAVATIONS AT NIPPUR.

INTERESTING DISCOVERIES.

IN 1888 the University of Pennsylvania despatched an expedition to excavate Nippur, an ancient city of Babylonia, situated midway between the Tigris and Euphrates, about fifty miles to the south-east of Babylon. All that remains of the city is an extensive group of mounds, which rise on an average to about 60ft. above the plain.

For eleven years, including interruptions, the "death-like stillness" which brooded over this ancient city (the probable site of Calneh, Genesis x. 10), with its treasures of long-forgotten millenniums, has been dispelled, and the place has been the scene of much activity on the part of the American expedition. Though much has been accomplished in the laying bare of ancient buildings, yet at the present rate of operations, although on an average several hundred Arabs have been employed, it will require fully 100 years to excavate thoroughly this ancient city.

A Large Palace Discovered.

Concerning the results of the work Professor Hilprecht, the scientific director of the work, has been able to report that the most sanguine expectations have been realised. In tracing the southern limits of the city a large palace of the pre-Semitic period (before 4000 B.C.) was discovered. No mound marked its site. It was clearly below the present level of the plain. Only one facade of the building was cleared. It is nearly 600ft. long, built with two storeys, having small windows near the ceilings. A large open terra-cotta vase, several tablets of the earliest known period, a substantially-constructed well, and many other antiquities, were discovered. The fact revealed in connection with these and other investigations is that the city in the earliest known period had the same enormous extent as in the late Neo-Babylonian period, and the territory embraced within the walls was at that time more fully occupied.

The Temple of Bel.

One of the highest points of Nippur is the conical mound called Bint-el-Amir ("Daughter of the Prince") by the Arabs who live in the neighbourhood. It rises about 95ft. above the plain, and covers the ruins of the ziggurrat Imkharsag, the stage tower of the temple Ekur. About the tower on all sides are the buried rooms and collapsed walls of the temple proper. Considerable time in the past has been devoted to the excavation of this structure. The uppermost stratum of the mound, not unlike nearly all the others examined, was found to be a cemetery, where in the period from about 200 A.D. the residents of Nippur buried their dead over the place where their ancestors worshipped their gods. Beneath this stratum were found the operations of those who built during the Parthian period, when a complete change in the form and character of the structure was made. Beneath this structure was found the temple that had been built by Ashurbanapal (668-626 B.C.). This Assyrian monarch restored and greatly enlarged the temple which had existed previous to his time. The next great builder, going backwards in the order of time, was Kadashman Turgu (1250 B.C.). The work of Kurigalzu, Bur-Sin II., Ishme-Dagan, Bur-Sin I., Ur-Ninib, and Dungi, of the third pre-Christain millennium, was also cleared away after being examined in all details when the ziggurrat, as it was seen in the time of Ur-Gur (2800 B.C.), was laid bare. Professor Hilprecht does not hesitate to date the founding of the Temple of Bel and the first settlements in Nippur somewhere between 6000 and 7000 B.C., possibly even earlier. Belonging to the temple at different periods previously to Sargon's time were found in this early stratum an altar covered with ashes of animal sacrifice; several large sacrificial vases made of terra-cotta; a perfect keystone arch, hitherto considered Roman, and many other interesting works of antiquity in bronze, stone and clay.

A Library of Clay Tablets.

The temple library has been found, and altogether there have been taken thus far from its rooms about 25,000 tablets, mostly unbaked. As only about one-twentieth part of this extensive group of hills has been excavated, in view of the peculiar topographical indications and the history of the temple, Professor Hilprecht estimates the probable number of tablets yet buried in the library to be from one hundred to one hundred and fifty thousand. They are almost entirely of a didactic character, and belong to the third millennium before Christ. The Elamites threw the building into ruins the century prior to Abraham's birth.

Smaller Art Relics.

Important inscriptions on clay and stone belonging to all periods of Babylonian history were also found during the last campaign in great numbers. In removing the upper stratum of mounds over one thousand sarcophagi, mostly of the slipper-shaped pattern characteristic of the late period (300 B.C. to 700 A.D.) were opened. In these were found gold and silver jewellery in the shape of bracelets, finger rings, nose rings, brooches, clasps; also pottery and many other things. Seal and seal cylinders, such as the Babylonians used in their business transactions; several hundred inscribed Hebrew and Mandaic bowls, showing the influence of Babylonian wizardry upon the Jews who continued to live at Nippur as late as 700 A.D.; great numbers of vases in enamelled and plain pottery, images of gods, playthings in terra-cotta, bas-reliefs, weights, utensils and coins in bronze and iron, &c., were found. Another important feature was the studying of all types and forms of pottery with a view to determining the age of many specimens excavated in former years. As regards portable antiquities of every description having special archæological value for the restoration of Babylonian history, this expedition stands prominently in the lead of those at the present time engaged in Babylonia.

A NEW CHAPEL AT OSMASTON.

A NEW chapel is being erected for the Wesleyans at Osmaston-by-Derby. The new church will occupy a position on the east side of the main road. The site runs through to Taylor Street, having two frontages. The present iron building facing Taylor Street will remain, pending the erection in the near future of the school block. The present contract includes the church, two vestries, and cloak-rooms. The style of architecture is Gothic. The church will be 59ft. long and 37ft. 6in. wide inside and 46ft. 4in. across the transepts, with an orchestra 15ft. by 13ft. There will be a gallery at one end only. The seating capacity will be for 433 adults, or a mixed congregation of 560 persons. The walls will be of brick with Derbyshire stone dressings. The front will have a double doorway with richly moulded jambs, and shaft of polished granite, with foliated caps, and over these will be a four-light window. These will be flanked with buttresses, having pinnacles and foliated finials. The roof will be partially open, with pitch-pine ceiling, and the timbers visible with arches underneath, and moulded wood tie beam and king post. The outline of ceiling is one that the architect has adopted because of its acoustic results. The joinery throughout will be of pitch-pine. The seats have solid ends. The rostrum will be of pitch-pine with panelled front, and open ends with wrought-iron balusters. The contract is let to Mr. W. Edwards, of Derby. The outlay, including the cost of land and architects' fees, will be about £3,000. The architect is Mr. John Wills, F.S.Sc., of Derby and London.

A New Water Reservoir is being constructed on the Appscourt, or Abb's Court, estate at Walton, by the Southwark and Vauxhall Water Company, to hold no less than 1,076 million gallons of water.

Masters and Men.

The Stockton Painters' Dispute has been amicably settled, the men having accepted an advance of a ½d. per hour in place of the 1d. and no overtime they asked for.

The Darlington Bricklayers, who struck recently for 10d. per hour instead of 9d., have accepted the masters' proposition that if the men's demand were withdrawn they would guarantee that no reduction from 9d. should take place for two years. The men, however, added a proviso to their acceptance that all of them applying for work be again reinstated, and, further, that all those who had commenced work in their places be discharged.

The Leicester Bricklayers and Labourers employed on the new wholesale market, who struck recently, have resumed work on condition that their alleged grievance will be fully discussed and settled by a mutually representative committee. Particulars of their demand were given on p. 246 of our issue for last week.

A Strike in the Hartlepools has occurred of 110 bricklayers' and plasterers' labourers, who have met a proposal of the masters to reduce their wages by a penny an hour by a demand for a halfpenny an hour increase. These represent only about half of the labourers employed in the district, several of the employers. builders, contractors and sub-contractors having agreed that the present conditions of labour and rate of wages shall continue. The present wages of bricklayers' labourers in the Hartlepools are 7d. and of the plasterers' labourers 7½d. per hour. The bricklayers are also asking for an advance of a halfpenny an hour on their present wage of 9½d., and the joiners ask for a penny per hour advance.

Dispute in the Bradford Building Trade.—The Bradford Federation of Master Builders have locked out all the carpenters and joiners, masons and bricklayers, and bricklayers' labourers who are members of the Operatives' Societies. This step is due to the non-acceptance by the men of arbitrations upon the several points in dispute, which are as follows: the joiners ask for a penny an hour advance from 8d to 9d., and refuse the masters' offer of 8½d.; the masons object to a penny an hour reduction from 9d. to 8d.; the labourers ask for a ½d. an hour advance, previously having asked for a penny advance; and the bricklayers are thrown out in consequence. The masters also desire to submit to arbitration a suggested alteration of the rules so that unionists and non-unionists should be allowed to work together, and that notices for alterations in rules should come into force half-yearly, on the 1st of November and the 1st of May, and not on the later date only. The joiners appear to be confident of success, and point to the fact that they possess a local auxiliary fund of over £600, out of which, should the necessity arise, the grants from the general fund will be increased to £1 in each case. The general fund of the society is computed at £250,000. As a result of the deadlock all the public works of the city are at a standstill. These include the Cartwright Memorial Hall, the markets extension scheme, the Conditioning-houses, the Drummond Road Board Schools, and the new Central Fire Station. The masons in the Shipley district are out for an advance of ¼d. per hour—from 8¾d. to 9d. The operative joiners of Shipley, who are in the same society as the joiners in Bradford, are of course, also idle. Being a stone built town, there are, of course, very few operative bricklayers in Bradford. There are two societies, however, each claiming a small membership, and it is understood that these will hold by any action taken by the masons. The general opinion prevailing amongst the master builders is that, were it not for the clause in their notice which stipulates for the amicable working together of society and non-society men, there would be no question of a strike; and the feeling has been expressed by several of the masters that if it is the object of the operatives to have none but union men in the country, they are perfectly right in their contention. The estimated approximate number of men idle is 1,300—700 masons, 300 joiners, 150 labourers, 50 bricklayers and non-union men.

The Joiners of Northwich, Hartford and Mid Cheshire District have accepted the masters' offe of an increase of ½d. per hour on their wage c 8d. They demanded 9d. and a reduction of on hour per day in the time worked.

The Leicester Stonemasons have given notice t their employers to terminate existing contract with the view of obtaining an advance of fron 9d. to 10d. per hour, a reduction of half an hou a day and other concessions.

The Strike at Edmonton, which has been i progress for the last two or three months, in th brickmaking trade, has terminated, and the me have resumed work. The dispute occurred i consequence of the proposal of the masters t reduce the pay. Last year the remuneratio was 5s. 7d. per thousand for "stocks" and 6s. 8d per thousand for red bricks, and this season th masters offered 5s. 1d. and 6s. 5d. respectively These terms were refused by the men, wh we understand, recently threatened that unles matters were settled they would not go in at al this summer. The masters have now agreed t pay last year's rates.

New Patents.

These patents are open to opposition unti June 11th.

1900.—Drain Pipes.—7,824. R. Stanley Manor Court, and R. H. Smith, James Street both of Nuneaton. The object of this inventio is to make the socketted end of a drain pip denser and harder. The socket-die is divide into two halves (or into several segments which, by suitable means, can be withdraw outwardly or contracted for the purpose o compressing the clay.

1901.—Opal-glass Tiles.—458. A. J. Davis "The Firs," Amblecote, Stourbridge. The opal glass is coated on the back with a saturate solution of hyposulphite of soda, after which i is heated, rendering the soda a spongy roug mass capable of resisting acids. Grooves ar next cut into the backing to give a good "key" for the cement.

"Mack" Slabs.—3,853. A. Mack, Ludwig strasse, 6, Cannstatt, Wurtemberg, Germany This invention relates to slabs of gypsum, cement or other rapidly-binding material, in which woo strips are embedded in order to facilitate fixing The strips are directly visible on one side, an may be provided with nails or screws. They ar laid parallel to one another, and are dovetail i section.

The following specifications were published o Saturday last, and are open to opposition unti June 17th. A summary of the more importan of them will be given next week. The names i italics within parentheses are those of communi cators of inventions.

1900.—4,548, Mouchel, piles, columns, &c 9,664, Dollar, stable fittings. 9,808, Di Vallière, concrete buildings. 10,609, Hill door checks. 12,888, Chapman (*Berliner*), floo coverings. 15,547, Commoss, apparatus fo ornamenting surfaces. 15,830, Tuckwell manufacture of imitation marble. 19,901, Ratcliffe, treatment of wooden planks. 21,559 Picking, construction of fireproof brick or bloc for walls, partitions, &c. 21,950, Bosshard (*Soc. Anon. Parqueterie Franco-Hongroise*) parquet floors. 22,823, Vaughan & Paten Vulcanite Roofing & Asphalte Co., Ltd. construction of wood trellis girders for supporting large span flat roofs.

1901.—977, Matthews, non-conducting floors 2,944, Hendler & Reeves, apparatus for generating and burning acetylene and other gase 4,154, Allen, machines for cutting borders an trimming wallpaper. 4,788, Unterlechner device for fastening windows, doors, &c., in a open position. 4,851, Gremme, manufacture o coloured patterns or embossed or relief work.

Mr. William Lee, builder, of Bolton, died las week at the age of sixty-nine years. He wa president of the Master Builders' Association an Association of Plumbers, a Freemason and a Oddfellow.

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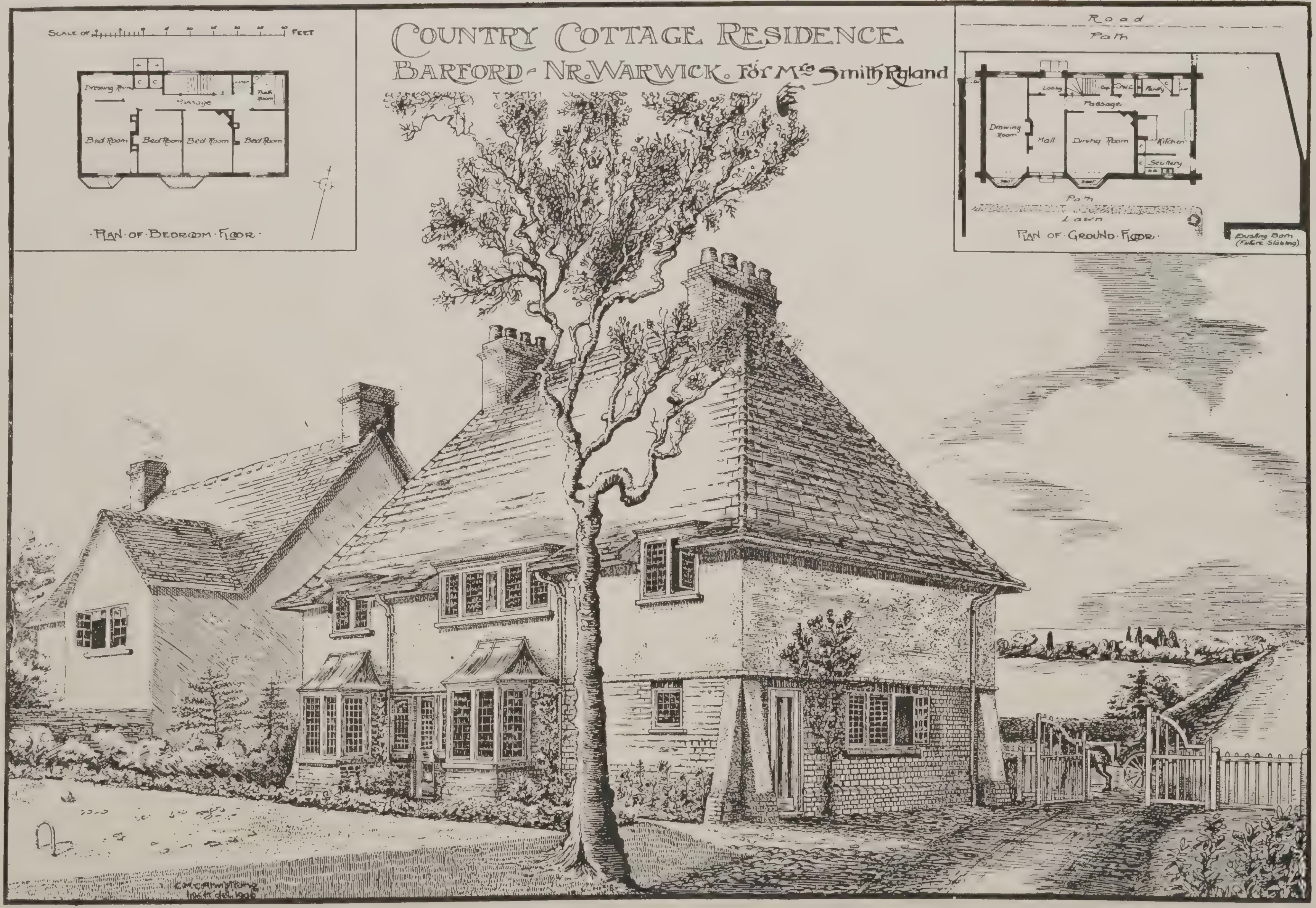
Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, May 8th, 1901.



CHARLES M. C. ARMSTRONG, Architect.

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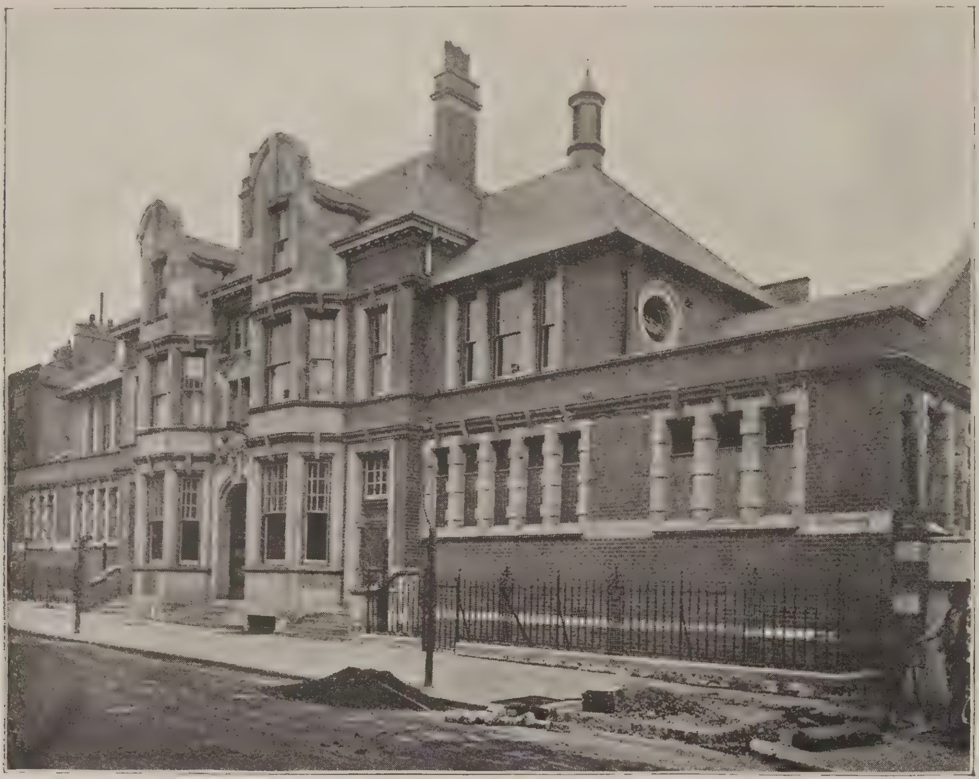
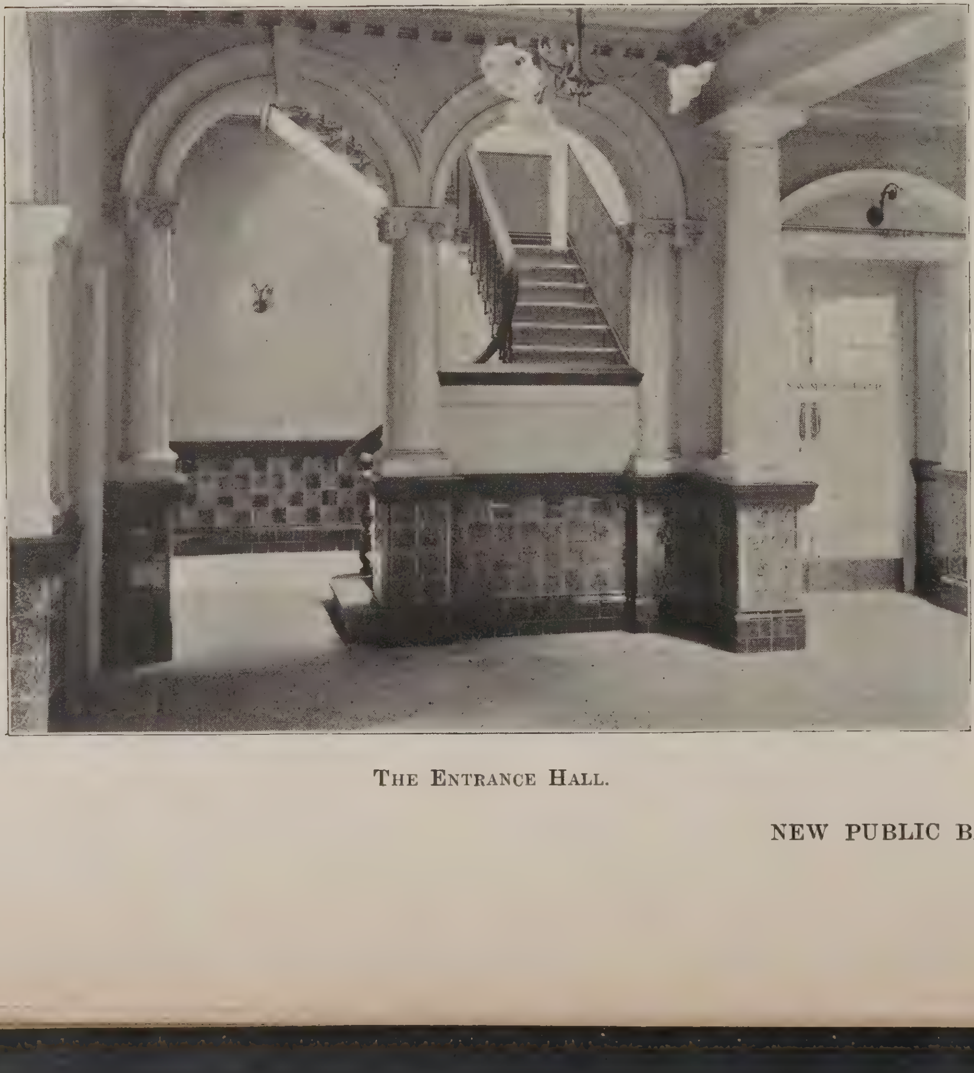


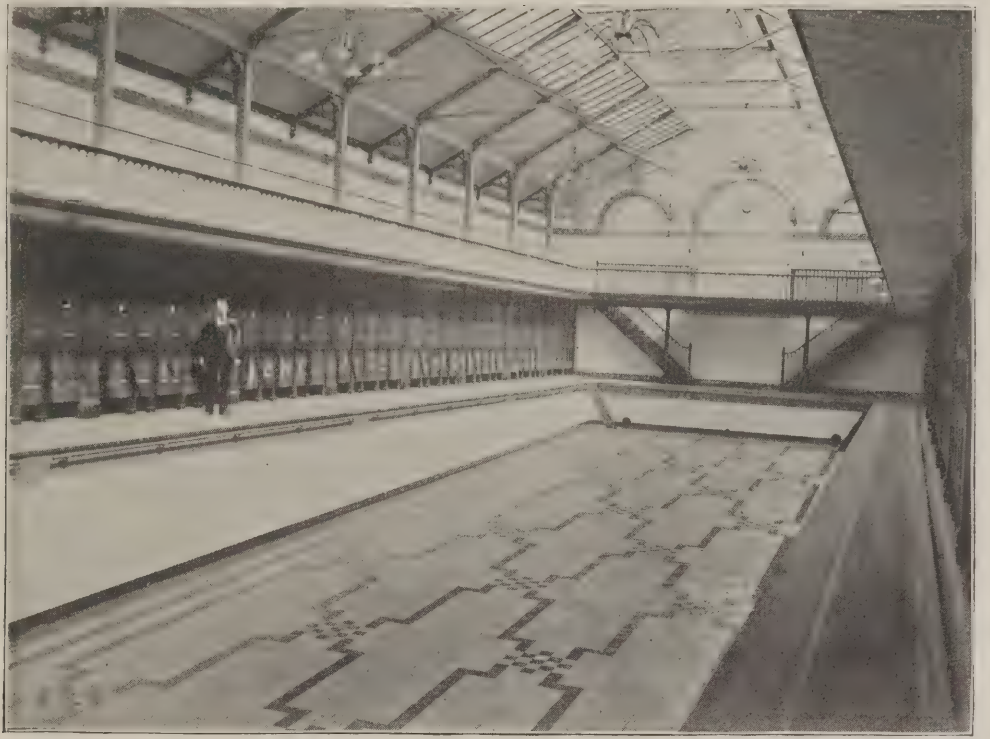
FRONTAGE TO BALAAM STREET.



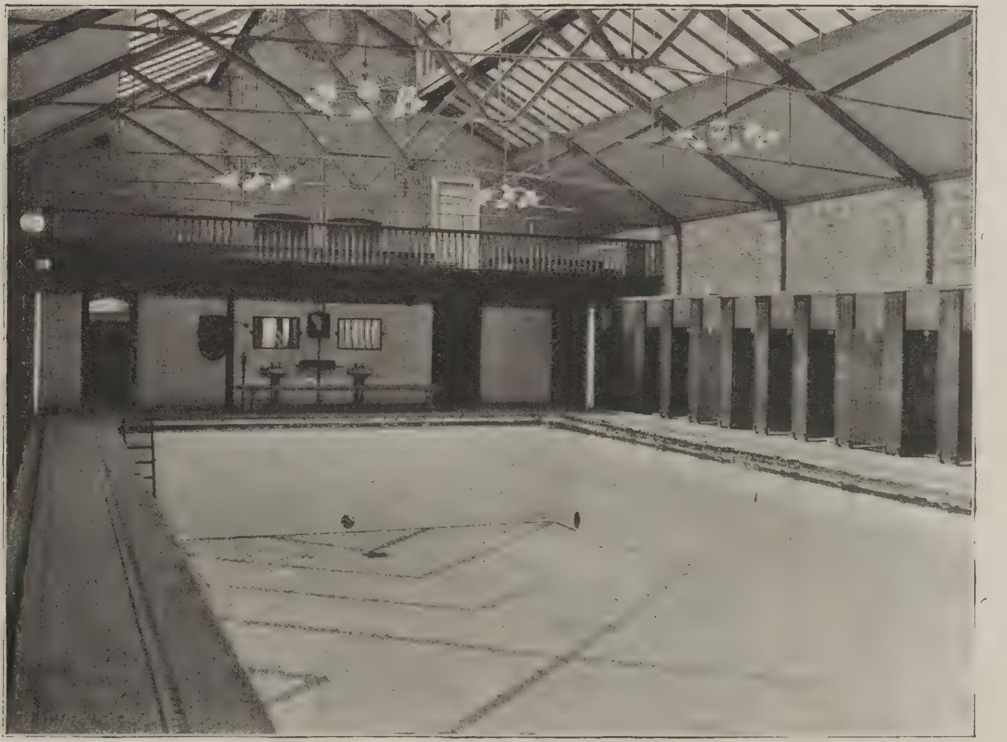
THE ENTRANCE HALL.

NEW PUBLIC BATHS AT PLAISTOW, LC

Supplement to
The Builders' Journal and Architectural Record,
Wednesday, May 8th, 1901.



Interior of First-class Bath.



Interior of Second-class Bath.

ON, E. A. Saxon Snell, F.R.I.B.A., Architect.

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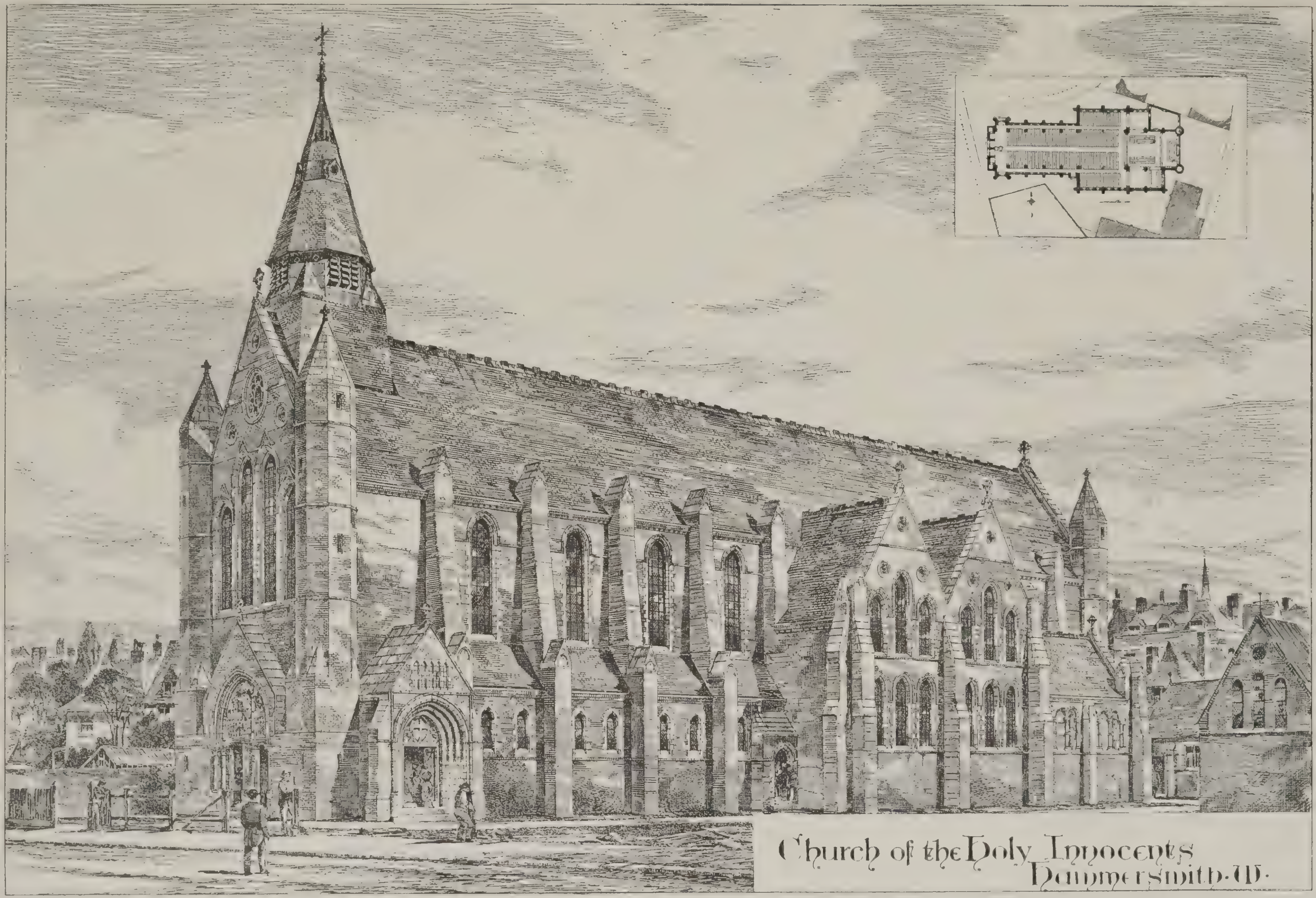
Church of the Holy Innocents
Hammersmith W.

James Brooks & Son, Architects.

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Bricks and Mortar.

APHORISM FOR THE WEEK.

Art is consummate when it seems to be Nature.
—LONGINUS.

Our Plates. THE country cottage in the village of Barford, three miles south of Warwick, was erected last year. The site was an enclosed one, owing to the need of keeping the new house somewhat of the same height and the frontage line of the main village street, and in order not to encroach on the existing barn, intended for future stabling. An attempt was made to keep the building as simple and compact as possible. It is built of red brick, with natural fawn-coloured rough cast above the moulded brick-course at bedroom level, with battered rough cast buttresses at the four angles. The roof is covered with tiles, with half round ridge and hip tiles; the eaves have a plastered soffit of 14in. projection. The external window and door-frames are painted white with dark green doors and casements, the latter being filled with leaded lights. All internal woodwork is painted white. Wooden pilasters, with door-hood and wrought-iron stay-bar, form a feature of the front door on the street elevation. Internally the newel posts to the staircase are carried up to ceiling of bed room floor with moulded caps to support purlin in roof, a glimpse of the stairs being obtained from the little hall through the circular arch to passage. The small offices are shut off by double doors from the rest of the ground floor rooms. The best grates were supplied by the Carron Company. and were of the old-fashioned hob pattern with glazed bricks or tiles; the locks, door furniture and cast-iron bell-pull were supplied by Messrs. T. Elsley & Sons. The long and narrow garden at back is well supplied with shady trees, and is a mass of fruit blossom in the spring; in it are old brick walling for fruit trees, and enough lawn for a small croquet ground. The builder was Mr. Albert E. Sheasby, of Barford, and the building was completed last November from the plans, and under the supervision of the architect, Mr. Charles M. C. Armstrong, of 5, High Street, Warwick. The view shown from the garden side is from a pen and ink drawing by the architect.—Particulars of the baths at Plaistow will be found on page 259.

The Church of the Holy Innocents. THE Bishop of Kensington dedicated the second portion of the permanent church of the Holy Innocents at Hammersmith last Saturday week. The mission, which was originally started to ease the work in the adjoining parishes of St. John's and St. Peter's, was placed under the care of the present vicar, the Rev. H. C. Eden, in 1885, and when, in 1891, the first part of the new building was consecrated by Dr. Temple, a separate parish was assigned to Holy Innocents, with Mr. Eden as incumbent. The parish is thickly populated, most of its people being of the poorer classes, and to provide for the spiritual needs of the inhabitants the massive church shown in our illustration (see centre plates) has been provided. The building, which has been carried out from the designs of Mr. James Brooks, is now practically completed, and is capable of accommodating from 1,200 to 1,500 persons. The cost of the work already carried out has been £14,000, and of this sum £1,250 has yet to be collected. It is proposed, when funds will permit, to build a tower at the south-west angle of the church, standing apart from, but connected by, a small cloister with the main building. Within the church much of the decorative work yet remains unfinished, and the rood screen which the vicar and some of his old choir boys are carving from the design of the Rev. E. Geldart will add considerable to the appearance of the church when it is completed.

Annecy. The old-world town of Annecy lies on the borders of a sapphire lake. Though the sun may on hot afternoons rob the mountains of their colour, and clothe every blade of grass in glittering mail, it is powerless to rob the lake of its wondrous blue. Though the churches were ruined and the towns of the country round Annecy were destroyed during the great Revolution, much of the old character has been preserved, and one can still pass down streets that have been but little altered since St. Francis trod them. At Annecy canals run inland from the lake above referred to, the tongue of land forming a garden, so that from the town the blue of the lake is broken by trees. Facing what formerly was Le Pont de la Halle is the Palais de l'Ile (illustrated on p. 251), its prow-shaped chapel cutting the stream towards the lake. On a height above it is the castle, from which a street descends steeply to the town, its houses, originally of stone, have, in bygone times, shot forth wooden balconies and staircases so as to almost completely hide their original fronts. Below, most of the streets have stone colonnades. On market days the country followers arrange their wares under the arches. The town is bound in on three sides by the mountains which almost encircle the lake and form a shield against the north wind which here is said to never blow. Beyond the town, on the south side, flows the Fier, celebrated for its gorges.

Present-Day Design. At a meeting of the Edinburgh Architectural Society held on the 24th of April, Mr. A. F. Balfour Paul, president, in the chair, an address was given by the honorary president, Mr. Harold O. Tarbolton, at the commencement of which reference was made briefly to the art and work of the century just past. Mr. Tarbolton then mentioned that a predominant note of the present day was a restless striving after originality and quaintness, and this he was afraid would work no lasting good for art. Simplicity and restraint were much required. One of the great dangers of present times was the undue influence of pretty drawings. Examples of this were found in the system of competitions where specialists in the work were employed by the competing architects, and attractive drawings and perspectives were turned out which often conveyed false impressions to the minds of the judges. It was most desirable that academies should require the accompaniments of photographs of the actual buildings with the water colour drawings of the subject, the latter being no criterion whatever of the architectural value of the building. In students' training, sketching and measuring played an important part, and in this there was a danger of dwelling too much on "sketchy bits," and forgetting their position in the building and their proportion. In his busy life the architectural student often found little time for general reading, and was apt to become a one-sided man; if, however, he neglected his general education, in later years he would find himself quite out of touch with those with whom he would mix, and from whom he would obtain employment. Mr. Tarbolton then presented the prizes gained in the design competitions throughout the session as follows: Honorary President's prize of £10 for three designs, viz., "A Town House," "A Market Cross," and "A Reredos and Altar," Mr. George Willet; President's prize of £3 3s. for design for entrance gates to park, Mr. Wellesley Bailey; Vice-president's prize of £2 2s. for a design for a wood mantelpiece, Mr. F. C. Mears.

Marbles of the Parthenon. AT a meeting of the Hellenic Society held last week, Professor Ernest Gardner in the chair, Professor Charles Waldstein read a paper on "A Discovery of Marbles related to the Pediments of the Parthenon." The marbles in question were at Dresden, and were three statuettes, with two only, however, of which he proposed to deal, as the other was so imperfect. They were procured in 1892, and came either from Rome or through Rome. No special value was in the first instance attached to them. "Sie waren," it was observed to him, "in den Verkauf geworfen"—a sort of makeweight with other works of art. This apparent negligence should not be imputed as blame—the labour of cataloguing tended to blunt the keenest eye, and a man in inspecting such objects generally did so with some definite point of view, and this tended to make him lose sight of others. The statuettes, one of which was male, were considerably corroded, but there was no mistaking the splendour of outline. The female figure was even better than the male, which represented, he had little doubt, the Kephisos, the River God of the Parthenon. The lecturer illustrated his views by a succession of pictures on the screen, and showed the connection and resemblances between this statuette with the Illissus of the Parthenon. He traced also the conception of the River God and its successive developments from the days of Polygnotus to Roman times. He was fully aware of the extreme danger of over-confidence—the archæologist was not as the mathematician or votary of the exact sciences—and it behoved him carefully to discriminate between the certain and the probable, the barely probable and the possible. Exact agreement was not found either in the quality of work or in the materials of different parts of the Parthenon; nor was evidence of geologists and petrologists by any means conclusive, for he had known a petrologist to ascribe to different sources two specimens known to have come from the same place. Variations, therefore, of this character in these specimens from other work on the Parthenon were by no means conclusive against the opinion which he had formed, and the male figure seemed clearly borrowed from the Theseus of the Parthenon. The greatest dimensions of these statuettes were 35 centimèters and 20 centimètres.

Manchester Flats. SPEAKING recently at Birmingham, Councillor Parkins referred to the flat system, and said he had gone with a deputation to Manchester, and had come to the conclusion that the flat system there was by no means creditable to the Corporation. The places shown them by the officials were all right, but he made private inquiries, and found in the flats some of the worse cases of overcrowding he had seen. The rooms, too, were immensely dear, 3s. a week for one room 12ft. sq., and 5s. 6d. to 6s. for two rooms according to the storey. And yet these flats, although they were dear and inconvenient—especially those on the fourth and fifth floors—did not pay, and it was difficult to get to know what the actual loss to the ratepayers was. Moreover, the Manchester Corporation was not going to build any more of them because the people would not have them. The successful candidates in Manchester last November were those who placarded the walls with "No more barracks." Whatever was done in Birmingham the gentlemen who undertook it must have respect for the rights and the necessities of the classes they were providing for, and must take care that they were not erecting monuments of their own folly.

Galveston. THE last report of the British consul at Galveston describes the results to the trade and prosperity of the town of the storm and innundation of September last, and the efforts which have been made to repair the damage and restore the town to its original state. The estimated loss of property was nearly 3½ millions sterling, including the damage to Government property, such as the jetties, forts and stores. By the beginning of March last the port was almost completely restored, the wharves were repaired, and the grain elevators nearly so, but there was only one railway bridge in place of three; most of the damaged factories and commercial houses had resumed business, and enough had been done to the water, gas and electric lighting works to make them serviceable for the present. The damage to private houses had been largely repaired, and many new dwellings were erected to take the place of old ones destroyed by the storm. Curiously enough, in spite of the disasters to the town caused by the storm and flood, the trade last year was the largest ever done by Galveston, and amounted to over 18 millions sterling, against 15¼ millions the previous year, the exports of raw cotton forming almost the whole trade of the place. The increase last year was due to the high price of cotton; but even in regard to quantity, the exports last year were slightly beyond those of 1899. Imports decreased on account of the destruction for a time of the wharves and warehouses, but British trade increased all round, and was nearly 44 per cent. of the whole, Germany coming next with 26½ per cent.

THEODOLITE CONTOUR SURVEYING.

By G. A. T. MIDDLETON.

THE tracing of contour lines over hilly country is one of the most laborious operations which a surveyor is called upon to undertake; and if, as is usual, the levels be taken first, pegs being driven into the ground along the contour, and these pegs be afterwards surveyed, either with chain only or with theodolite, great errors may readily creep in and much trouble may be involved through the accidental removal of the pegs between the two operations. It is possible, however, to do the whole thing at one operation; and though apparently tedious, much time is saved in the end by adopting this course. It is difficult, and demands extreme care upon the part of the surveyor, who must be well acquainted with theodolite traversing with the assistance of the traverse tables, but on the other hand is capable of absolute proof of its exactitude.

Two field books must be used simultaneously. One is an ordinary theodolite traverse book, with columns for the line, its declination east of north and its length (these being entered in the field); for the latitude (N. or S.) and the departure (E. or W.), given in units of distance from each theodolite station in succession; and for the total latitude and total departure from the first theodolite station. These are calculated by the aid of the traverse tables, sometimes in the field, but more generally in the office.

The other book is an ordinary levelling book, with the two columns usually devoted to rise and fall replaced by a single column devoted to entries of the collimation plane level at each setting of the instrument.

A theodolite only is used, the vertical arc being clamped at zero and carefully levelled at each setting up, so that it becomes practically a level with which horizontal declinations from the meridian can be accurately read. If it be fitted with stadia points for tacheometric determination of distances, the work is greatly facilitated—so greatly, that they are almost essential.

The theodolite stations, not being necessarily on any one particular contour, can generally be selected in succession, so that the distances between them can be accurately measured along a straight line by means of the chain without encountering serious obstacles; but the contour line, in its windings, will frequently take the staff-holder into positions whose distance from the instrument can only be measured by means of the stadia points, without an infinity of unnecessary trouble.

In the example which has been taken for illustration, the first position of the instrument (Station 1) was selected within view of the bench mark, whose height (11·72ft.) above datum level was known. At that position, the vertical arc was clamped to zero, the instrument carefully levelled, the horizontal vernier clamped to zero, and the whole instrument revolved horizontally till the north point of the compass-needle also pointed to zero, and then clamped. The horizontal vernier was then released, and the telescope directed to a levelling staff held at the bench mark, when the vernier was adjusted by means of its tangent screw and clamped.

The staff reading was 4·45, and as the instrument had been properly levelled this was entered as the back sight in the level book, the height 11·72 being entered as "height above base," and the words "bench mark" being entered in the distance column. By adding the reading and the known height of the bench mark together, the total height of the collimation plane above base (or datum) is ascertained to be 16·17ft., and this is entered accordingly.

It being desired to trace a contour line at a height of 10ft. above datum, this height (10·00) is entered in the second line of the level book as "height above base" with the entry "points on 10ft. contour" in the "remarks" column. By deducting this 10·00 from the collimation level of 16·17 it is ascertained that so long as the instrument remains on Station 1 the staff reading at all points on the 10ft. contour must be 6·17, which is accordingly entered in the "intermediate" column.

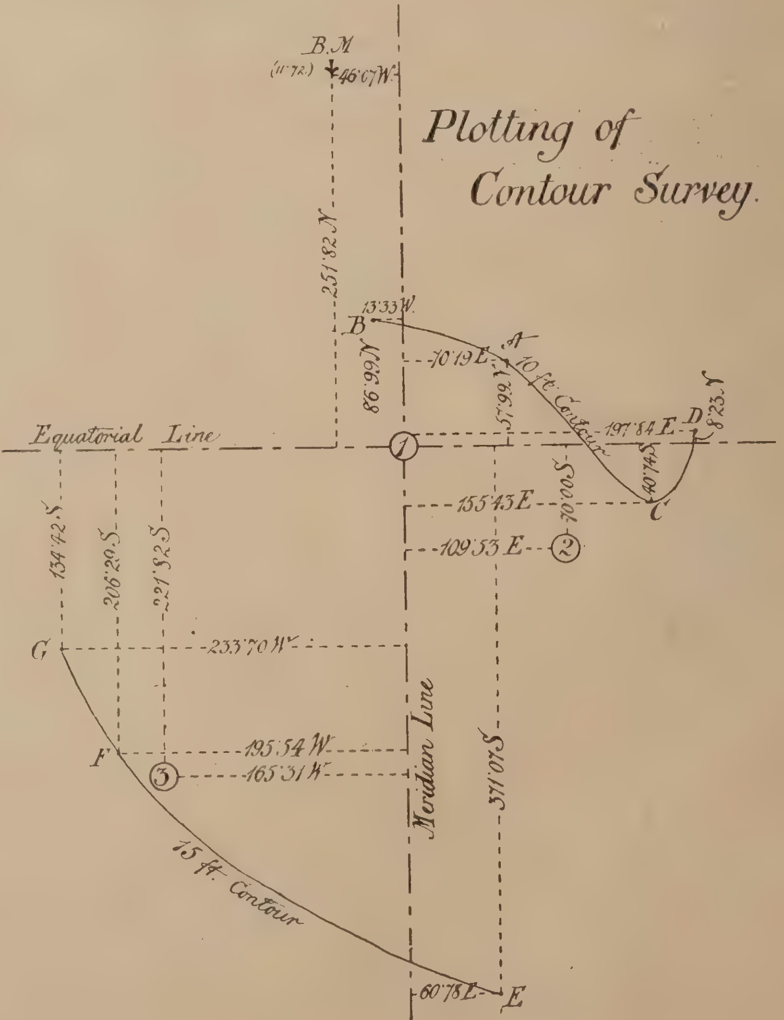
TRAVERSE FOR CONTOUR SURVEY.

Line.	Decl. E. of N.	Length.	Latitude.	Departure.	Total Lat.	Total Dep.	Remarks.
	° ′						
1--Bench mark	349 38	256	251·82 N.	46·07 W.	251·82 N.	46·07 W.	Pt. 1 is Theo. station.
1—A - -	50 29	91	57·90 N.	70·19 E.	57·90 N.	70·19 E.	A is pt. on 10ft. cont.
1--B - -	351 17	88	86·90 N.	13·33 W.	86·99 N.	13·33 W.	B „ „
1--2 - -	122 35	130	70·00 S.	109·53 E.	70·00 S.	109·53 E.	2.—Theo. station.
2--C - -	62 47	64	29·26 N.	56·90 E.	40·74 S.	166·43 E.	C is pt. on 10ft. cont.
2--D - -	48 28	118	78·23 N.	88·31 E.	8·23 N.	197·84 E.	D „ „
2--E - -	189 12	305	301·07 S.	48·75 W.	371·07 S.	60·78 E.	E is pt. on 15ft. cont.
2--3 - -	241 5	314	151·82 S.	274·84 W.	221·82 S.	165·31 W.	3.—Theo. station.
3--F - -	297 12	34	15·53 N.	30·23 W.	206·29 S.	195·54 W.	F is on 15ft. cont.
3--G - -	321 57	111	87·40 N.	68·39 W.	134·42 S.	233·70 W.	G „ „

The staff-holder is now sent to some position which looks as if it would give this reading, the horizontal vernier is again released, and the staff is read. If the reading exceed 6·17 the holder is signalled to move up the hill; if the reading be less than this he is motioned to move downwards, and so on, until it is obtained; though for many purposes it is unnecessary to get a reading nearer than ·02 to that which is theoretically correct, so small an error being often due to the presence or absence of a tiny stone under the heel of the staff. The point so ascertained may be called A, and so entered in the "distance" column of the *level book*. At the same time its actual distance from the theodolite station can be ascertained by means of the stadia points, and so entered in the second line of the *traverse book*, as from 1 to A = 91 links; while consultation of the vernier will show the declination of this line from north to be 50deg. 29min. The latitudes and departures are then worked out in the usual way; but as these are calculated as from Station 1, no correction is necessary, by addition or subtraction, when making the final entries in the columns for totals. The traverse book is finally rendered perfectly clear by entering in the "remarks" column that A is a point on the 10ft. contour.

LEVELS FOR CONTOUR SURVEY.

Back Sight.	Intermediate.	Fore Sight.	Collimation Level.	Height above base.	Distance.	Remarks.
4·45	--	--	16·17	11·72	Bench mark.	—
--	6·17	6·17	„	10·00	A, B	Pts. on 10ft. contour.
5·16	--	--	15·16	10·00	A	—
--	5·16	--	„	10·00	C, D	—
-	--	·16	„	15·00	E	Pts. on 15ft. contour.
5·18	5·18	--	15·18	15·00	E, F, G	—
--	--	8·45	„	11·73	Bench mark.	Error ·01.


Plotting of Contour Survey.

It is well for the sake of clearness to use numerals to designate theodolite stations, and letters to denote points on the contour, or *vice-versâ*.

Examination of the two field books and of the plotted plan should be sufficient, with the above explanation, to show any careful student how the rest of the work is done. The only further difficulty occurs at the change of theodolite stations, when fore and back sight entries have to be made in the level book in the usual way; and when it must be borne in mind that the total traverse distances from Station 1 of, say, Point D, are found by comparing the distances of that point from the station (Station 2) from which it was observed with the totals of Station 2 from Station 1. Thus Station 2 is 70·00 south of Station 1, while Point D is 78·23 north of Station 2; so that, in the totals, Point D is 8·23 north of Station 1.

Law Cases.

Delay by Sub-Contractors: Important Appeal Case.—The case of *Leslie & Co., Ltd.* v. *The Managers of the Metropolitan Asylum District* was heard in the Court of Appeal on April 29th. The question arose upon a contract (dated July 23rd, 1895) entered into between the plaintiffs and the defendants for the erection of a hospital for infectious fevers at Hither Green, Lewisham. A great part of the work had been let out to sub-contractors and experts, including Messrs. Doulton, of Lambeth, and Messrs. Berry & Sons, of Westminster. The question was, Who was to be responsible for alleged delay on the part of these sub-contractors? The contract provided that the plaintiffs should, at their own cost, execute "the works" shown on the plans, including the chimney-stacks and heating apparatus. The time in which the work was to be completed was two years, and the price to be paid was £210,688. Mr. Hall was the architect. The contract contained the following clause relating particularly to the chimney-stacks: "The contractors shall provide the sum of £137 10s. prime cost for each central stack of flues in large wards above the level of the ground floor. These stacks will be of faience, fire-clay, terra-cotta and concrete, and, including hearths, grates, &c., will be supplied, fixed and finished complete by a specialist potter. The contractors are to supply all necessary scaffolding, plant, water and hoisting." The plaintiffs communicated with Messrs. Doulton, who undertook to do the necessary work. Part of the claim in the action arose from the alleged delay on the part of Messrs. Doulton in doing this work. A second head of claim arose from a sub-contract for the supply of the necessary steam and hot-water apparatus. The contract contained the following clauses relating particularly to this apparatus: "The hot-water supplies to baths, lavatories and sinks, except where otherwise specified, the hot water, heating, &c. . . . will be done by specialists, but the contractors are to attend on, cut away for and make good after them. The hot services will be brought by the specialist to the following points of outlet (specifying the same), but the valves thereon are to be supplied and fixed by the contractors. Note.—All hot-water services, as well as heating apparatus, . . . will be done by specialists." On February 2nd a sub-contract was made between the plaintiffs and Messrs. Berry & Sons by which the latter agreed to supply this apparatus for £11,900. It was alleged that Messrs. Berry had also been guilty of delay in executing this work. The delays of the sub-contractors were owing to the difficult and special character of the work. Owing to these alleged delays the plaintiffs could not complete their works and get the architect's final certificate and payment accordingly. They therefore claimed damages on the footing that there was an obligation upon the defendants to see that the work was done by the specialists and sub-contractors within a reasonable time. The claim was referred to Mr. Pollock, one of the Official Referees, who considered the contract and voluminous correspondence involved in the case. Counsel for the defendants contended that they were not liable on the ground that Messrs. Doulton and Berry & Sons were sub-contractors with the plaintiffs, and any claim for delay lay against them, and not against the defendants. The learned referee held that the defendants were liable to the plaintiffs, and the defendants appealed from that decision to the Divisional Court, which held that the plaintiffs could not impose upon the defendants the consequences of the delay of the sub-contractors. The plaintiffs appealed. —The Court dismissed the appeal.—The Master of the Rolls said that it appeared from the contract and the specifications that the plaintiffs were to provide everything to make the hospital complete, and that, although specialists were to execute some of the works so contracted to be executed and provided by the plaintiffs, these latter works formed part and parcel of the entire works, for which the defendants were to pay the plaintiffs the sum of £210,668, the plaintiffs out of this sum paying the specialists. He came to the conclusion that the defendants could not be liable to the plaintiffs for the delays of Doulton & Co. The defendants had never contracted with Doulton & Co. The persons who contracted with Doulton & Co. were the plaintiffs, and the plaintiffs alone. The defendants throughout studiously avoided contracting with Doulton & Co., who were sub-contractors of the plaintiffs or their agents. Doulton & Co.'s work was work which the plaintiffs had contracted with the defendants to provide for in the £210,688. The defendants never paid Doulton & Co. one penny for their work, and were never under any liability to do so. Doulton & Co. were paid by the plaintiffs, and by no one else. It seemed to him that the Divisional Court were quite correct in holding that the defendants were not liable to the plaintiffs for the delays of Doulton & Co. If anyone had a remedy against Doulton & Co. it was the plaintiffs and not the defendants. It was said that the plaintiffs only contracted with Doulton & Co. so as to get rid of the necessity of the defendants having to obtain the consent of the Local Government Board to a contract between themselves and Doulton & Co., which would have been required if the plaintiffs had not contracted with Doulton & Co. However that might be, there stood the plaintiffs' undoubted contract with Doulton & Co., upon which beyond doubt the plaintiffs could sue Doulton & Co. and the defendants could not. It was next argued that if this was so, and the plaintiffs sued Doulton & Co. for delays, they would do so as trustees for the defendants, and that if the plaintiffs recovered damages from Doulton & Co. they would have to hand over the damages recovered to the defendants. His Lordship did not agree. The truth was that there was no trust at all. How could the plaintiffs be trustees for the defendants for what they might recover from the specialists, their own sub-contractors, who were merely doing the work which the plaintiffs otherwise would have had themselves to carry out under their contract with the defendants. In his Lordship's opinion there was no substance in the contention. With regard to Messrs. Berry & Sons, the above remarks applied to their case, it being, if possible, a stronger case than Messrs. Doulton & Co.'s against the plaintiffs' contention. The appeal must, therefore, be dismissed with costs. The Lords Justices delivered judgments arriving at the same conclusion.

Huddersfield's New Theatre: The Architect's Successful Claim.—In the King's Bench Division of the High Court of Justice last week the case of *Matcham* v. *The Northern Theatres Co., Ltd.* was heard. This was an action brought by Mr. Frank Matcham, architect, against the defendants, who have theatres in several towns in the North, to recover £1,059, his fees for preparing plans, specifications, &c., for a new theatre at Huddersfield. Defendants denied liability. The plaintiff's case was that in May, 1899, he was instructed by the defendants to prepare plans, specifications, &c., for a new theatre which they proposed to erect at Huddersfield. He carried out the necessary work, and he submitted that he was entitled to recover £1,059, being 2½ per cent. on the estimated cost of the theatre (£22,183), £500 for getting out quantities, and £5 1s. 6d. for railway fares. The defendants contended that they were not liable, as the plaintiff did not carry out their instructions. They said that the plaintiff was requested to prepare plans, &c., for a theatre to cost £15,000, whereas the building which he designed would have cost £28,000 to erect. In those circumstances, defendants said, the plans were of no use to them, and they were not liable to pay for them. Plaintiff denied that the price of the building with an engine room and water tower was limited to £15,000, and said that with economies the work could have been carried out for £20,000. The jury found for plaintiff for £325. Judgment was entered accordingly, with costs.

Correspondence.

St. Sidwell's Church, Exeter.

To the Editor of THE BUILDERS' JOURNAL.

EXETER.

SIR,—Permit me to say that we do not accept Sativola as our dedication saint (see p. 223 of BUILDERS' JOURNAL for April 24th). It is Sidwell pure and simple, although no doubt the monks of the Middle Ages sometimes Latinised it into the form given by your correspondent. Still, I have it from my friend the Rev. Prebendary F. C. Hingeston-Randolph—certainly the most learned man on such matters in the county—that in Bishop Stafford's Register (A.D. 1395-1419) the apples in the garden of the dean and chapter at *St. Sidwell's* are referred to. The late Professor Freeman says in his "Exeter" (1887): "There is a local legend of St. Sativola. or Sidwell, whose name lives in the dedication of a suburban church. Her story seems to be placed late in the seventh century, and her worship is anyhow older than the time of Æthelstan."

The Rev. S. Baring-Gould in his recently-published "Devon" (1899) tells us that Athelstan came to Exeter in A.D. 926, and gave to the monastery of SS. Mary and Peter (afterwards the cathedral) the relics of St. Sidwell. "This, he adds, "was a local Saint, of whom very little is known save that she was the sister of Paul, who became abbot and bishop of Léon, in Brittany."

It is quite true, of course, that the original church (probably British) has long since disappeared, but the fine Beer stone arcades of the fifteenth-century edifice, and the western tower of Heavitree stone are still in existence. The tower, next to the old Roman towers now doing duty as transepts to Exeter's fourteenth-century cathedral, is by far the finest of any date in or about the city. In the belfry the father of Sir Walter Raleigh was confined a prisoner during the disturbances of his time, and the upper part of the tower itself was blown off by an accidental explosion of stored gunpowder. The damage was repaired with bricks. The main part of the church was rebuilt early in the last century by the late Mr. William Burgess, who also erected a wooden spire and put it upon the western tower, surmounting it with an ancient weather-cock that had formerly done 268 years' continuous service upon the low spire over the north transept tower of the cathedral. This fine specimen of ancient copper-work, upon an iron vane, was placed upon the cathedral spire in 1484, and continued there until 1752, when, with the spire, it was removed. When St. Sidwell's spire was built in 1812 the then Dean and Chapter presented the old relic to our parish, and it stood there upon its spire, doing honest work, day and night, until taken down on May 2nd, 1899. Although 417 years old, it is now just as good as new; and, when the present repairs to St. Sidwell's, under the able direction of Mr. E. H. Harbottle, F.R.I.B.A., the cathedral architect, are completed, it will again surmount the brave old tower. The repairs in hand practically mean a conservative renovation of the tower. All the brickwork has been removed, and new stonework will be substituted.

Thus, ere another year is passed, our tower will again be what it was full five hundred years ago, with the vane—of which every St. Sidwell's man is so vain!—once more perched securely and proudly upon the top thereof.—Yours truly,

HARRY HEMS.

A New Style.—A north country newspaper, in describing a church, recently stated that "the style is certainly unique, reminding one, if we are not mistaken, of the Besantine period" (!).

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

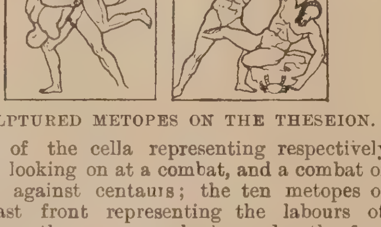
The Theseion at Athens.

GRAYS.—R. J. T. writes: "I am drawing from Phené Spiers' Orders the Theseion at Athens, in which only one carved metope is given. I should like to include the two next in order. Kindly name a book in which they may be found, and also give a description of the building."

The "Theseion" is one of the best preserved monuments of ancient Greece; yet its early history is unknown, and its dedication little more than a matter of conjecture. Archæologists are however agreed in rejecting its identification with the Theseion mentioned by Aristotle in the recently discovered "Constitution of Athens," by Pausanias in his "Description of Greece," and by Plutarch in his "Lives." On grounds both topographical and architectural the theory (first advanced by Pervanoglu, and supported by the veteran Dr. Dörpfeld) of its dedication to Hephœstus, is now generally accepted. From certain peculiarities in the details Dr. Dörpfeld concludes that the building is just a little later than the Parthenon. For instance, the continuous moulding, devoid of guttæ, under the frieze of the cella, and the base moulding around the walls, betray, in Dr. Dörpfeld's opinion, a disregard for the strictness of the Doric type, which would hardly, he thinks, be attempted before the erection of the Parthenon.

Notwithstanding the general acceptance of the "Hephœstus" theory, the fact remains that the sculptured metopes are entirely devoted to the exploits of Theseus and Hercules; yet, from the attachment marks on the back of the pediments, it is known that these spaces were not only filled with sculpture, but Dr. Sauer believes that from these marks he can make out the subjects! in one case, the birth of Erichthonius, son of Atthis and Hephœstus, and in the other the rising of Hephœstus from the sea after his fall.

The disposition of the sculptures remaining on the building is as follows: the east and west friezes of the cella representing respectively deities looking on at a combat, and a combat of Greeks against centaurs; the ten metopes of the east front representing the labours of Hercules—these are much decayed; the four metopes on the north and south sides respectively, at the ends nearest the east, devoted to the exploits of Theseus. The remaining metopes are quite plain, and have never been filled with sculpture. The whole of the sculptured metopes are engraved in the Italian *Monumenti dell' Instituto Archæologico;* also in "Stuart and Revett." We give rough notes of two from the north side: Theseus killing Cercyon, and Theseus killing Sciron. For further particulars of the temple, see Penrose's "Principles of Athenian Architecture," Harrison's "Mythology and Monuments of Ancient Athens," Stuart and Revett's "Antiquities of Athens," and the BUILDERS' JOURNAL for 1899. J. A. M.


SCULPTURED METOPES ON THE THESEION.

Taking off Brickwork Quantities.

CLAPTON. — R. N. E. writes: "Kindly answer the following question on brickwork: The general description of a house is as follows: 18in. work two lower floors, 14in. work two upper floors, in red facings, backed in with stocks in mortar, gauged segmental arches, with moulded labels, plain gauged pilasters 18in. face, $2\frac{1}{4}$in. projection, moulded string-course 3in. deep, moulded cornice five courses deep, 12in. projection; the two latter breaking round the pilasters, and scalloped aprons to windows. The red facings to be neatly pointed with a weather joint. State minutely how you would measure all the brickwork in connection with the front."

Excavation Concrete and Walling. Collect mean length of four walls "on waste" by length out to out, added to breadth in clear, and twicing the quantity. Transfer to dimension column for length of main items.

Footings. 18in. wall = 2-b. wall = four half bricks in thickness ∴ four courses of footings = 1·0 depth. This will be the second measurement of first item, the length being first. Average the footings on waste by adding width of top course to width of bottom and halving. This will be entered in description column as "$3\frac{1}{4}$-b. ftgs."

Lower Walls. The next item will be the same total length, unless the front wall only is to be dealt with. The mean length would then be the measurement from outside one end to inside the other end, but the actual length would be taken, in view of the remainder of the question, as the length out to out on face. The height from top of footings to top of wall plate on set-off would be the second measurement in the item, and the description would be reduced brickwork in mortar to 2-brick wall, generally entered simply as "2-b. wall."

Damp-proof Course. The length will be same as last item and breadth 1ft. 6in., the description being taken from specification, either Tylor's glazed perforated damp-proof course, a double course of slates in cement, $\frac{1}{2}$in. Seyssel asphalt, or whatever may be desired. The former alternatives to be described as "Measured nett, allowance to be made for cutting and waste."

Upper Walls. If the whole of the brickwork were being taken the length would now be increased by 18in. to allow for $4\frac{1}{2}$in. set-off on four walls, but if the front wall only is to be taken the length will remain the same as for the lower walls. The height will be from the termination of the previous measurement of height to the top of upper wall plate. The description will be "$1\frac{1}{2}$-b. wall."

Facings. For the length take the same length as before, and for height take from ground line to under side of cornice; describe as "Extra only on stock brickwork for best pressed red facing bricks (name)."

String-Course. Take same length as last item, and describe as "Extra labour and material on facings to 3-in. moulded string—course continued round pilasters."

Cornice. Take same length as last item, and describe as "All labour and material in forming moulded brick cornice five courses deep, 12in. projection as sketch." With "No. extra to bonding and forming internal and external mitres to ditto."

Pilasters. Take for width the actual width plus two returns = 1ft. $10\frac{1}{2}$in., and for height the distance from ground line to under side of cornice, and times it for the number of pilasters. Describe as "Extra labour and materials over facings for gauged work in bonding and forming plain pilasters 18in. by $2\frac{1}{4}$in."

Deductions. Begin at the top and work downwards For windows generally, take width in clear by height to springing-line, and describe as "Ddt. $\frac{1}{2}$-b. wind. op," timesing the item for the number of windows to which it applies. If the reveal should be more than $\frac{1}{2}$-b. wide the description must be amended accordingly. The next item will be the deduction for the remainder of the brickwork in the same openings. The width will be $4\frac{1}{2}$in. more on each side to allow for sash frame, and 3in. more in height to allow for head of sash frame. In the description the thickness will be whatever is required to make up the total after deducting the reveal. No further deduction is made for splayed jambs. Door openings will be dealt with in a similar manner, allowing 2in. at sides and head beyond the reveal. In deducting the facings the width will be lessened by the breadth of reveals.

Arches. Take the mean length by the width on face plus soffit, and describe as "Extra on facings for rubbed and gauged segmental arches."

Labels. For the labels over windows take length, and describe as "Extra labour and material for forming moulded labels over window arches as sketch."

Aprons. Give dimensioned sketch, and describe as "Extra on facings to labour and material forming scalloped aprons in gauged brickwork to windows, projecting $2\frac{1}{4}$in. as sketch."

Relieving Arches. These should be numbered, and described as "Extra labour only in rough relieving arches to ft. in. opening (average), and in. soffit including all cutting."

Rough Cutting to splayed window jambs. Measure whole surface cut per ft. super.

Fair Cutting. Per ft. run as "Fair-cut skewbacks," or circular as "Circular fair-cutting to brickwork over arches."

Pointing. Super the whole area of wall with reveals, soffits, returns and moulded work, and describe as "Rake out and point brickwork with weather joint." This is according to the question, but is unusual. The arches, pilasters and aprons should be tuck-pointed.

HENRY ADAMS.

Cost of Building.

ST. ALBANS.—ANXIOUS writes: "What price per cub. ft. should be allowed for (1) a brick mission church with stone dressings, in Late Decorated style, tiled roof, no tower, plastered inside, with wood-block flooring; (2) a three-storey Board school for 1,200 children, plain brick facings; (3) a one-storey school for 400 children, plain exterior?"

Schools, churches, chapels, lecture halls, town halls, technical institutes and public libraries cost from 6d. to 1s. per cub. ft., according to the solidity and amount of ornament. It is difficult to price without seeing the drawings or knowing the locality; but, approximately, say for the church described 9d. per ft. cube, for the three-storey Board school 8d., and for the one-storey school 7d. Possibly each might be 1d. less. HENRY ADAMS.

Weale's Architectural Books.

WONERSH.—H. S. G. writes: "I wish to obtain the following books of Weale's Scientific Series: (1) 'Modern Architecture,' by W. H. Leeds, Talbot Bury and E. L. Garbett; (2) 'The Art of Building,' by Edward Dobson; (3) 'Cottage Building,' by C. Bruce Allen; (4) 'Construction of Roofs of Wood and Iron,' by W. Tarn; (5) 'Hints to Young Architects,' by G. Wightwick; (6) 'Practical Bricklaying,' by A. Hammond. Where can I obtain these books?"

The above-named books can be obtained from Mr. B. T. Batsford, 94, High Holborn, W.C. Their prices are as follows: (1) 6s.; (2) 2s.; (3) 2s.; (4) 1s. 6d.; (5) 3s. 6d.; (6) 1s. 6d.

Weight of Iron Columns.

LANCASHIRE.—WEIGHTS writes: "What is the most expeditious way to calculate the weight of a tier of cast-iron columns as per sketch (not reproduced)?"

This query is not sufficiently explicit. It is not clear whether a dimensioned drawing is provided and the weight is required for the bill of quantities, or whether the dimensions themselves, thickness, &c., are required. The base plate shown is unusual and inconvenient in form, and there are other faults in the design. The weight may be estimated roughly by allowing 4 cubic inches to the pound. More exactly, a cubic inch weighs ·261b., or a square foot 1in. thick weighs $37\frac{1}{2}$lb. HENRY ADAMS.

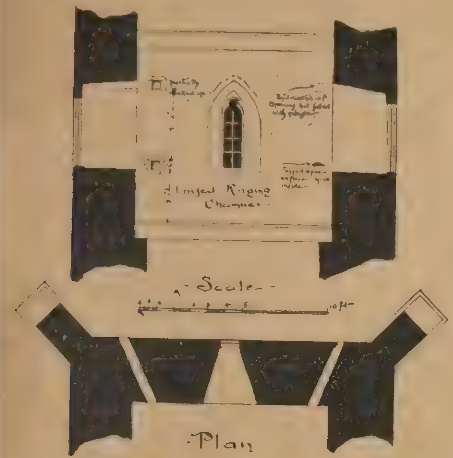
Surveying and Draining Land.

CHERBORNE.—E. J. C. writes: "What is a reliable and simple method of procedure in making a survey of a field whose capacity is approximately from 12 to 14 acres, the boundaries being somewhat irregular and in places undefined? The land in question is proposed to be laid out for building purposes with new roads constructed as shown on sketch (not reproduced), and then cut up into smaller lots and sold. What is a suitable scale for plotting this to? There is a fall of about 6ft. to existing road, the boundary of field at this point being 5ft. above it, and the field generally very wet. Do you think this should be drained before developing it. I contemplate putting a main drain of 6in. agricultural pipes down centre with 4in. branches into same, these latter spaced at a distance of 21yd. apart or thereabouts. Do you think this would have a beneficial result on the land?"

The articles on surveying on p. 264 of this issue, and on page 180 of our issue for April 10th last will provide you with some information, and you should consult Mr. Middleton's "Surveying and Surveying Instruments." (Price 3s. 9d. B. T. Batsford). The usual scale for plotting out estates is 44ft. to the inch. It is certainly an absolute necessity to drain the land before building on it, but as the draining is only temporary we would advise that channels be cut, which, with the fall there is, should give good results.

Use of Channels in Church Tower.

LONDON, E.C.—INQUISITOR writes: "Kindly give me an idea as to the use of 6in. by 6in. channels in the first floor of a church tower in Kent, as shown by the accompanying sketch. There are also indications of others on left side (not shown), but none on the right. The lowest channel is 25ft. from the ground. They are of the same size on the outer face, and have a slight rise from the inside."



This is a difficult question to answer satisfactorily, and the best that can be done is to surmise. That the holes were intended for the support of beams or putlogs may be dismissed on account of their diagonal arrangement on plan. They were, however, apparently left, when the tower was built, for some deliberate purpose; but they are not the right shape for arrow slits, and the fact that they rise towards the outside is against their use for the discharge of weapons of any sort, though church towers, especially near the coast, were frequently fortified and reserved as last places of defence for the village folk in the event of attack. Towers were also frequently used both as beacons and as look-outs; and small holes of this sort, if directed towards other beacon towers or eminences, might possibly have served for outlook, though they are low in the tower for such a purpose. Another suggestion is that they might have served for astrological or astronomical observations, but they are too nearly horizontal for this to be probable. Of all suppositions the most likely is that the chamber served as a large dovecote, these holes being the entries for the birds. If we read the plan correctly, they occur only on its southern and western faces, so that the birds could enter in safety, except during direct south-westerly gales, and even then some shelter would be afforded by the south-west buttress. The question arises as to whom the manorial rights belonged to, as a vicar would hardly be privileged to keep so large a number of pigeons as could be sheltered in a church tower unless he possessed rights over neighbouring corn lands. Thus, if the church has a large chancel, it was probably monastic, and the neighbouring lands belonged to the monastery, and they might have belonged to the ecclesiastical patron of the living; and in either of these cases the probability of the tower having served as a dovecote becomes almost a certainty. On the other hand, if the land around used to belong to antagonistic laymen, the probability is reversed. G. A. T. M.

Plastered Ceilings.

HASLAND, CHESTERFIELD.—BAFFLED writes: "I shall be glad to have your opinion on the following: My parents built a house which was finished fourteen months ago. The ceilings, which were set white, are now covered with cracks (not open ones), although under the first-floor tiled hearths, which are carried by brick arches, the cracks are open and plaster appears like falling. I also notice that the ceilings are marked with yellowish-brown spots, and that the course of the laths can be distinguished when standing in certain positions. The house is in other respects soundly built, and was carried out by an architect with a great deal of experience. The joists in each first-floor room have one row of solid bridging to 7in. by 2½in. joists, 12in. apart. Do you consider ceilings 'set white' to be satisfactory? What thickness should two-coat plaster work be? My opinion is that the small cracks are caused by the ceilings being 'set white,' which dried too quickly (joists unfirmly fixed would not cause cracks all over, and on the first-floor ceilings), the large open cracks under bedroom hearths through arches giving way, the yellowish-brown spots by the lath nails rusting and the course of laths showing through plaster, because the latter was not the proper thickness (it had two coats). I should be glad if you could give any other reason. The ceilings are also very black, as if they had not been cleaned for eight or nine years. We use gas with a ¾in. main and No. 4 burner. Other people using same gas are not so troubled. What do you suppose is the reason of this?"

The theories given to account for effects produced in the ceilings seem to us reasonable. Bad materials were doubtless used and the work scamped. The work being only of two coats. *i.e.*, the floating brought up from the laths in one coat and then set, would account for the lines of laths showing, both by the thinness of the plastering and also by the dust, laying on the plaster between the laths, forming a dirty background. This collecting of dust on thin plaster where it is open between the joists also accounts for joist lines being seen, and can be prevented by putting a backing of paper on. The two-coat work would also partly account for the cracks. Plasterwork should not be of two but of three coats, that is to say, as usually specified by "lath, render, float and set." Ceilings "set white" should be satisfactory if properly done. We should think that the blackness of the ceilings was caused by defective gas burners, bad materials being used in the plaster, the plaster not being set upon a proper floated surface, and the dirt and dust above, which we have just referred to.

Defect in Quantities.

REX writes: "A building contractor has signed drawings, specification and quantities, and also building agreements in which he undertakes to complete the building in accordance with specification, drawings, and quantities; the latter were prepared by the architect and paid for by the builder. On completion of the work, various omissions are discovered in the quantities, but the work has been executed in accordance with the specification and drawings. For the cost of this work, omitted from the quantities but included in the specification and drawings, has the builder any remedy against the building owner or against the architect?"

We think the builder cannot establish any claim against the building owner as the quantities were prepared by his servant, he having been paid by the builder. The question would not have arisen had the builder engaged an independent quantity surveyor; but as the architect to all intents and purposes acted in the same manner, the builder is bound by his action, and should only claim against him for negligence. It is usual when the preparation of the quantities is not paid for the builder to disclaim any responsibility for inaccuracy in the quantities; this safeguards both building owner and architect, but bears hardly upon the builder, who if he devotes labour to checking the quantities is unrewarded, or, if he assumes them to be accurate, loses if they are not so. There would appear no adequate remedy for this under the present system. D.

The Attention of Readers is directed to the particulars of our new schemes of insurance given on page 270 of this issue.

Engineering Notes.

Messrs. Keiller's New Works, Silvertown, Essex, are being ventilated by means of Shortland's patent exhaust ridge ventilators, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

Ramsden Dock Improvement.—The work in connection with the lowering of the sill at Ramsden Dock lock has now been completed. The work of removing the dam is proceeding apace, and the third row of struts has been reached.

Durban Harbour.—The harbour engineers have prepared a scheme for the improvement of the port at a cost of nearly £3,000,000. The scheme includes four miles of quay works, and makes provision for a graving dock. The improvements will quadruple the present capacities of the port.

Middlesex Tramway Schemes.—The Middlesex County Council has notified the Light Railway Commissioners of an intention to apply for powers to construct electric tramways from Tottenham, through Woodgreen and Friern Barnet, to a point near Colney Hatch Asylum, and from Highgate Archway, the London boundary, along Archway Road and Great North Road, to the Hertfordshire boundary near Whetstone. The total cost will exceed half a million, and the council has entered into a contract with the North Metropolitan Tramways Company to work the whole system. An extension of an important nature will be made, a spur line being contemplated from Highgate railway station to the Muswell Hill entrance of the Alexandra Palace and Park. It will probably connect with the line at Colney Hatch. The Finchley District Council contemplate a tramway of their own to join the proposed Finchley and Hendon lines.

The Institution of Civil Engineers.—At the annual general meeting of this Institution last week, Mr. James Mansergh in the chair, the result of the ballot for the election of officers was declared as follows: President, Mr. Charles Hawksley; vice-presidents, Sir William H. White, Mr. J. Clarke Hawkshaw, Mr. F. W. Webb and Sir Guildford L. Molesworth; other members of council, Mr. James Barton, Mr. Horace Bell, Sir Alexander Binnie, Mr. B. Hall Blyth, Mr. C. A. Brereton, Mr. T. Forster Brown, Mr. R. Elliott Cooper, Mr. G. F. Deacon, Mr W. R. Galbraith, Mr. G. H. Hill, Mr. J. C. Inglis, Dr. Alexander B. W. Kennedy, Mr. A. G. Lyster, Mr. J. A. McDonald, Mr. E. P. Martin, Mr. William Matthews, Mr. Alexander Siemens, Mr. Thomas Stewart, Mr. J. I. Thornycroft, Professor W. C. Unwin, F.R.S., Sir E. Leader Williams, Mr. C. W. Darley, M. E. P. Hannaford, Mr. William Shelford, Mr. John Strain, Mr. F. R. Upcott. The council of the Institution of Civil Engineers have made the following awards for papers read and discussed before the institution during the past session: A George Stephenson medal and a Telford premium to Mr. Harry E. Jones; Telford medals and premiums to Mr. G. A. Hobson and Mr. E. Wragge; a Watt medal and a Telford premium to Mr. Joseph Husband; Telford premiums to Mr. J. T. Ford, Mr. L. L. Buck, Mr. W. H. Stanger. Mr. B. Blount and Mr. W. J. Doak; Crampton prize to Mr. E. Sandeman.

A New Gas.—A committee of the House of Commons have had under consideration the Mond Gas Bill, which authorises the formation of a company, with a capital of £1,000,000, to supply gas manufactured under patents taken out by Dr. Ludwig Mond for power and heating purposes in the large industrial district 100 square miles in extent to the north-west of Birmingham. The process of manufacture is as follows: A mixture of air and steam is forced through the burning slack used for the manufacture of the gas, with the result that the whole of the combustible matter in the slack, including the coke, is converted into gas. The ordinary cost of slack was 6s. a ton, and every ton used yields a quantity of sulphate of ammonia which can be sold as a fertiliser for 4s. 6d., so that the actual cost of fuel is 1s. 6d. a ton. The gas cannot be used as an illuminant. Five manufacturing stations are proposed to be erected in different parts of the Black Country, and a network of 2ft. 6in. mains laid down. The promoters hope that the demand for the gas will reach 84,000,000 cubic feet every twelve hours. At 2d. per 1,000ft.—the price at which they expect to be able to supply the gas—as against the average rate of 2s. now charged in the district, they will obtain an income of £210,000. The nett cost of production and distribution, after deducting the amount received for sulphate of ammonia, is estimated at £85,000, leaving a profit of £125,000. The Bill was opposed by the Corporation of Birmingham, about one-half of the other local authorities in the district, and several gas and electric lighting companies. A further objection urged was that the gas was of a highly poisonous character, and, as it must be distributed at a very high pressure, there must be considerable leakage. The promoters reply that the gas is not to be used for domestic purposes, and that therefore there will be no danger of leakage in private houses. Any leakage outside would soon be discovered on account of the distinctive odour of the gas, which is described as being "like that of ordinary coal gas which had been buried for some time and dug up again."

Mr. Ernest Kilburn Scott, M.I.E.E., A.M.I.C.E., has taken up the position of engineer and manager (United Kingdom, Colonies and Egypt) to the International Electric Co. of Leige, the London offices being at Clun House, Surrey Street, Strand, W.C. Besides the ordinary run of electric lighting work, Mr. Scott proposes to give special attention to the application of continuous and multiphase motors to machine driving in factories, iron and steel works, &c; also to mining work, electric traction for tramways and railways and to long-distance power transmission. The International Electric Company of Leige is the most important electrical concern in Belgium, and was founded in 1889 by Mr. Henry Pieper, general director. The manager and technical director, Mr. G. J. Melms, was with the General Electric Co. of America for many years, and as manager for Messrs. Brown, Boveri & Co., Frankfort, personally supervised the construction and operation of the Frankfort Municipal Electric Station—one of the largest central power stations in Europe—having a single-phase motor load of upwards of 6,000 h.p., including three motors of 750 h.p. for working the city tramways. Under Mr. Melms's management, the International Electric Co. of Leige have of late years taken a prominent position in the electrical world, having created many new and special forms and types of machines for the application of electricity, and also supplied machinery to numerous large and well-known firms in the United Kingdom.

The Production of High Temperatures.—By Dr. Hans Goldschmid's process very high temperatures are produced by the combustion of aluminium. This process depends on the intense heat developed by the chemical reaction when a mixture of finely powdered aluminium and oxide of iron is ignited. This reaction is very easily started, but it does not take place if the mixture, which has been named "thermite," is wet, nor does it occur spontaneously or by percussion. But when once begun it proceeds with extreme rapidity, and in the course of a few seconds a mass of molten iron and corundum is obtained, the temperature of which may be 3,000 degs. Centigrade. The application of thermite to welding steel tubes and rails was illustrated recently at a demonstration in Pimlico. The tubes—which may be of any size up to 6in. or 7in.—have their ends cut square and pressed together by clamps. The place to be welded is then enclosed in a small sheet iron box with a jacket of wet sand, and the thermite, ignited in a crucible, is poured into the box. The result is that the ends of the two pipes are quickly heated up to the welding temperature and thus united, the clamps being slightly tightened at this stage to force the ends more firmly together. The pipes are then removed from the clamps, and the ring of metal and slag that encircles the joint is knocked off, a perfectly clean joint being left. The whole operation takes only a minute or two. In a similar manner the welding of steel rails for railways or tramways can be effected. The demonstration was carried out under the direction of the Allgemeine-Thermit Gesellschaft, of Essen, the owners of the patents, and it is intended forthwith to form a company to work the patents in the United Kingdom.

Views & Reviews.

Theory of Engineering Construction.

This book, we learn from the preface, makes no claim to rank as a text-book, but is a selection of such examples of the questions set in the examinations of the Institution of Civil Engineers which involve a knowledge of useful rules and formulæ, with a short description of their practical application in certain cases; it is intended rather as a brief summary of the various engineering text-books. Blank pages are inserted after each example to enable the reader to add notes if he desires to do so. The book is divided into four sections dealing respectively with theoretical and elementary applied mechanics, theory of structures, strength and elasticity of materials, and geodesy. It will be seen that the book supposes the student preparing for the examinations to already have a knowledge of the ordinary text-books and doubtless of the requirements of the examinations, and yet the author devotes a section to the syllabus of them.

Altogether we see no adequate excuse for its publication: a text-book it is not; as a summary it is inadequate; and as a model of the answers to give in these examinations it is harmful. There are already enough brief summaries published in the pocket-books of formulæ, &c., but we have yet to see a summary that will be clearly intelligible and full, so that it will recall half forgotten things and explain the reasoning on which the rules are based clearly enough to be easily followed. There is considerable need for a new text-book that will be short, clear and yet full of information. This book affords another instance of the style usually adopted in engineering text-books and summaries, namely, in the use of numerous abbreviations, such as V = initial velocity in ft. per second, v = ultimate velocity in feet per second, A = the angular velocity, &c., and in leaving out numerous particles and connective words, and calling each part of the diagrams by letters and not by its name as well. Although this saves space it fails in its intention of clearness, and a little more explanation and the words spelt out would often make it read easily, whereas if the mind has to translate as it goes along and refer to the diagrams at every point, the attention is distracted. The methods, too, adopted of selecting actual examination questions and answering them is not systematic enough for a summary, as often several principles are involved in one answer and thus one has to turn to the index to find any particular item and then ferret it out from the midst of a dissertation on other matters.

"The Theory of Engineering Construction: A Reference Book for Civil Engineers and Students," by Ernest H. Essex, A.M.I.C.E. 5s. nett. London: The St. Bride's Press, Ltd., 24, Bride Lane, Fleet Street, E.C.

NEW BUILDINGS IN BRISTOL.

NEW buildings have just been erected in Wine Street and Union Street, Bristol, on the site of the premises which have been for many years in the possession of Mr. Chambers at the corner of these streets. The area of the ground floor of the new building is occupied by a spacious and well-lighted general drapery shop, on the Wine Street level, entered by two entrances, and also two entrances in Union Street; at the back are archways and a staircase leading to a commodious ladies' hosiery, corset and outfitting department. Beyond this, separated from it by a plate-glass partition, is the gentlemen's hosiery, gloves and general outfitting department, both being accessible from the Union Street entrances. The basement extends over the whole area of the building. The shop is lighted by a covered glass roof at a high level. A staircase extends from the back of the shop; the wall against which it is fixed is constructed with pillars and arches following the lines of the staircase. On the first floor are extensive showrooms. The second floor is occupied by stock rooms, offices and workrooms. On the third floor are dining-rooms, cloakrooms, store-rooms, kitchens, &c. The premises are heated throughout with hot-water pipes, the furnace of which is in the cellar underneath the basement. The artificial light throughout the building is electricity (installed by Messrs. Buchanan & Curwen, under the supervision of Mr. Herbert Thomas Sully, A.I.E.E., electrical engineer). A polished brass and plate-glass shop front, with four deeply recessed entrances, polished mahogany and teak doors and door frames with moulded and carved pediment heads, extends the entire length of the Wine Street and Union Street fronts. The building is designed in the Renaissance style, and the external walls are constructed of brick faced with freestone. The contractor for the building was Mr. R. F. Ridd, of Wilder Street. The carving was executed by Mr. W. Smith, of Montpelier. Messrs. Foster & Wood, of Park Street, Bristol, were the architects of the building.

MODEL DWELLINGS AT PORTSMOUTH.

NEW model dwellings have been erected near Fratton Station for thirty-two families. They are the first blocks of buildings designed on the "flat" system to be erected in Portsmouth for the housing of people who can only afford to pay a small house rent. The erection of the new dwellings has been made necessary through the proposed extension of the town station to include the area lying between it and Station Street, and they are designed to provide equivalent accommodation for the Station Street residents, who will thus be ejected from their present houses. The rent varies from 4s. 6d. to 6s. a week, according to the number of rooms required. The builders and owners are the Joint Railway Companies, and the work of erection has been executed by Mr. Henry Jones, of Southsea, the cost being between £9,000 and £10,000.

The buildings are comprised of two blocks, and each stands in its own tar-paved court, enclosed within a brick boundary wall entered through big iron gates, and a quarter of an acre in extent. One block is composed of two-room "flats," and the second—the one adjoining the station premises—of three-room "flats." Each block is built upon a rectangle, which is bisected into squares. The bisection is caused by stairs and landings that give access to the various domiciles, and the iron railings—about 6ft. high—terminate each landing. Each building is 50ft. high, and consists of four floors, including the ground floor, there being no basement. There are four "flats" on each floor. Access is given from the centre of the building. The stairs and landing are not enclosed, but open to the fresh air. Each floor is of concrete on iron girders, the concrete, for comfort, being covered with ordinary deal boards. Best red local kiln bricks have been used in its construction, and the exterior is faced with Portland stone dressing, with a 4ft. dado of glazed bricks around the base of the building. The "flats" are entered straight into the living room, which is 11ft. by 13½ft., and 8½ft. in height. Around are the usual domestic appurtenances, an iron sink and draining-board is in one corner, with the coal store hidden away beneath it, and on the other side of the room is a handy dresser and a kitchen range. The adjoining bedroom, which is lighted by two windows, is slightly smaller than the living room. In the case of the three-roomed "flat," a second bedroom is placed next to the living room, the two windowed bedroom at the corner of the block being reached by a short corridor. The w.c. is reached from the landing, and one is provided for every two families. The drainage of the blocks is on the best modern lines, and a water reserve is provided by two five hundred gallon tanks placed at the top of each building.

On each landing there is a small trap-door opening into a conduit that runs down the building from top to bottom. Down here will disappear all the dust, ashes, &c., which will be periodically collected from the dust-bin that stands like a water-butt at the outlet pipe below. The approaches and the stairways are lighted by gas provided by the owners, and to ensure cleanliness the walls are faced with "crystopal" glazing lining. With the same object in view, no wall paper will be used in the "flats" themselves, but in its stead the walls will be coated with a patent "water paint."

At the back of each block is a circular dome-shaped wash-house, backed against the boundary wall, fitted, in all, with eight copper "coppers." Around the periphery of the building are draining boards and iron sinks, and the floor, of Bradshaw's asphalt, is to be covered with beech gratings for the convenience of the laundresses,

Surveying and Sanitary Notes.

Mr. George Donaldson, who has been road surveyor to the Middle District Committee of Berwickshire County Council during the past eight years, has been appointed to a similar position under the Kirkcaldy District Committee of the Fifeshire County Council.

A City Improvement.—The London County Council has decided to contribute £16,800 towards the cost of widening Bloomfield Street, where opportunity had occurred owing to the rebuilding of premises. The street has of late years become a main route for the omnibus traffic to Liverpool Street.

A New Pavement is being tried by the Paris municipality. Its inventor is a M. Garcher, who manufactures his product from finely-crushed glass, which is subjected to great heat and heavy pressure, the result being a substance which is said to be less affected by wear than the best and hardest granite, and to support a pressure of over 10,000lb. to the sq. in. To break a slab of the material a weight of nearly five tons falling from a height of 3ft. was necessary. This glass pavement is being laid down at the expense of its inventor in several test places where the traffic is exceptionally heavy. If, at the end of five years, the pavement has worn well, the municipality has undertaken to adopt it on a large scale; if not, M. Garcher, who evidently has confidence in his material, is under contract to replace the old pavement at his own cost. Unfortunately, the new pavement is said to be noisy. It ought not to be dusty, however.

A CONVALESCENT HOME FOR SHEFFIELD.

An important addition has been made to the charitable institutions of Sheffield in the erection and completion of the George Woofindin Convalescent Home, at Whiteley Wood. The late Mr. George Woofindin bequeathed to Sheffield about £120,000, which sum was placed in the hands of trustees, who were empowered, after making certain legacies to existing institutions, to devote one-third of the estate to the erection of almshouses, and two-thirds to building a Convalescent Home. The testator's first wish was carried out in the block of almshouses at Hunter's Bar, opened about a year ago.

The Convalescent Home stands on the hillside at the end of the Whiteley Woods, with a southern aspect, and the whole place is designed so as to obtain the utmost air and light. The front windows command a very pleasant stretch of hill and valley. The hill rises abruptly behind the Home, and wards off the inclement north winds. The grounds are to be laid out with terraces. The building is in the Renaissance style of architecture. It is of red brick with stone dressings, and the woodwork is painted white. The rooms are distributed on a symmetrical plan. The principal apartment on the ground floor is the large dining hall, and here all the inmates will meet for meals. The hall is wainscotted with oak, and the furniture is also of oak. A screen divides the dining hall from the entrance hall. In common with all the rooms, the hall is flooded with light from many lofty windows.

The chief feature of the men's wing—which lies to the west of the central portion—is a large billiard and smoking room, fitted up completely with a full-sized table and inviting lounges. There is also in the wing a reading and writing room, and a parlour. The women's apartments are on the other side of the entrance, and here is a spacious parlour. A verandah runs in front of each wing, whereon the invalids may enjoy the summer air. The women's and the men's quarters have each separate entrances, and separate staircases leading to the sleeping rooms. The matron's sitting-room, the office, and store-room lie to the east of the central entrance, and the kitchen and servants' quarters are placed at the north of the main corridor. The bedrooms on the first floor are arranged on the most approved hygienic methods. The space is divided by slight wooden partitions into cubicles, each room containing two or three beds; the large French windows opening upon a broad balcony. The women's bedrooms are placed above their rooms on the ground floor, and similarly with the men's quarters. Over the central portion on the second floor are rooms which may be used either as men's or women's bedrooms, according as there is an overflow in the number of men or of women seeking admittance. There are also rooms for the isolation of more serious cases requiring individual treatment. The Home will accommodate seventy patients, and is so planned as to admit of extension in the future. The architects are Messrs. Hemsoll & Paterson, of Norfolk Row.

Builders' Notes.

Mr. John Stott, builder, of Marion Street, Bingley, died recently at the age of sixty-five years. Deceased had been largely identified with the extensive building operations of recent years in the Mornington Road district of Bingley.

London County Council.—At last week's meeting the Improvements Committee recommended that £16,800 should be contributed by the Council as one-half of the nett cost of widening Bloomfield Street, City, to 50ft, between East Street and Eldon Street, proposed to be undertaken by the City Corporation. The committee pointed out that the increasing importance of London Wall as a main thoroughfare for traffic had emphasised the necessity of widening portions of it. The recommendation was adopted. Among the Bills against which the Parliamentary Committee recommended the Council to present petitions was that relating to Christ's Hospital. Mr. Stuart Sankey asked what the object was in opposing the Bill. The chairman said that they desired to obtain a *locus standi* before the committee on account of the fact that it was proposed to obtain powers to build over a disused burial-ground. Mr. Stuart Sankey objected to the proposal of the committee as an utterly unworthy one. It was unreasonable to ask the authorities of Christ's Hospital to give up a piece of their land as an open space. To insist upon this would be to do a great harm to a charity which had done an immense amount of good for London. The Council should consider that if the site were not sold the Governors would not be able to proceed with the building of the new school at Horsham, or maintain the school at Hertford. He moved to refer the report back. The amendment was put and lost, and the report agreed to. On the reception of the Bridges Committee's report, Mr. Ward stated that Greenwich Tunnel was now completed two-thirds of the way across the river.

A New Test for Portland Cement.—Mr. J. Patchett, of 3, Lime Villas, Green Lane, Birmingham, forwards us the following particulars of his new test of the condition of Portland cement: Use 10 grains of the cement in question, and empty into 400c.c. of water in an ordinary 500c.c. tubular measure, with 100 markings and about 10 inches between zero and containing mark. Cork or place the palm of the hand over the mouth of the tube, and shake up for a couple of minutes so as to well mix. Twist in fingers to get equal settlement of the cement, and stand by for an hour so as to clarify. Then from a saturated solution of ammonium oxalate pour in up to the 500c.c. mark. At once a white cloud of lime oxalate will form, which allow to settle for a couple of hours and note height above the cement.

The space of	½	mark will equal	½	per cent.	free lime in the cement.
,,	1	,,	1	,,	,,
,,	2	,,	2	,,	,,
,,	3	,,	3	,,	,,
,,	4	,,	4	,,	,,

These percentages are approximate only, and purposely given slightly in favour of the contractor. To cleanse the tube after use, gently disturb the cement with a piece of twisted wire, shake up and throw away. Add in a little hydrochloric acid to free any adhering substance, after which on rinsing with water the tube is again ready for use. A saturated solution of barium chloride will reveal the presence of gypsum in the same way, but in this case half a mark will indicate 1 per cent., while 1 mark will indicate 2 per cent., &c.

Mr. Samuel Emony, of Cobden Street, Dresden, Stoke-on Trent, who until two years ago carried on the business of a builder at premises on Stone Road, Longton, succumbed to senile decay at the age of seventy-one years.

The Phrahzit Fireproof Material Co., Ltd.—An order having been made on March 20th last for the compulsory winding up of this company, the usual meetings of creditors and shareholders were held last week. The chairman reported that the company, which was promoted by the Guarantee and General Trading Corporation, Ltd., was registered on April 15th, 1898, with a nominal capital of £20,000 in shares of £1 each. It was formed to acquire a patent process for the manufacture of a substance known as "Phrahzit," a fireproof material, and with that object to enter into an agreement with Mr. J. T. Szek. Under an agreement of April 14th, 1898, Mr. Szek agreed to sell to a trustee for the company his rights relating to "Phrahzit" for the sum of £13,332, of which £500 was payable in cash and £12,832 in fully-paid shares. The agreement provided that Mr. Szek should be managing director of the company for five years, but, in consequence of his bankruptcy, which occurred in 1898, he was ineligible to act as director, and consequently was appointed manager of the company. The difference between the amount at which Mr. Szek had agreed to sell his patent to the corporation and the amount at which the company were to buy it was £6,665 in shares, and was apparently to be received by the corporation as promoters. Shares to the number of 7,168 were offered for subscription. The first allotment of shares took place on May 17th, 1898, when 420 shares were allotted for cash. The company never had any working capital to enable it to commence business. The company's patent was now held by the liquidator of the corporation, who claimed a lien upon it in respect of advances amounting to £213 made to the company. A statement of affairs had been filed, which showed a deficiency of £7,794 as regarded both creditors and shareholders, but no value had been placed on the patent rights. At both meetings it was resolved that the matter should remain in the hands of the Official Receiver as liquidator, and the shareholders also nominated a committee of inspection.

Keystones.

The New Buildings of the Carnarvon Cottage Hospital were opened recently at a cost of about £4,000.

A New Chapel at Derby.—The New Methodist New Connexion Chapel and Schools in Dairy House Road, Derby, were formally opened recently.

The William Black Lighthouse Memorial on the island of Mull is now completed. The tower is at Duart Point, near Duart Castle. The red and white group-flashing light will be seen for twelve miles out at sea. It is under the care of the Northern Lighthouses Commissioners.

The Bishop Creighton Memorial will take the form of a bronze statue by Mr. Thornycroft in the south choir aisle of St. Paul's Cathedral; a portrait by Mr. Herkomer for the collection at Fulham Palace, from a sketch made by him last year; and, it is to be hoped, a replica for the National Portrait Gallery.

A Memorial Window in the Parish Church of Malpas, near Newport, has been erected to the memory of Captain Freke Lewis Prothero, of the 1st Welsh Regiment, who was mortally wounded at Leeuw Kop on Sunday, April 22nd, 1900, and died at Bloemfontein two days' later. The window depicts St. George, the martyr saint.

A New Board School at Gateshead.—The Gateshead School Board are about to commence Kelvin Grove School, from the design of Mr. J. Landell Nicholson, architect, 55, Northumberland Street, Newcastle-on-Tyne, which was placed first in competition last year but delayed through the bricklayers' strike, which was settled recently. This is the first of two blocks, and gives accommodation for 400 infants on ground floor, and 360 junior boys and girls on first floor, at a cost of about £7,000.

£100,000 for a Church.—Under the will of Lady Charles Brudenell Bruce, a sum of nearly £100,000 is bequeathed to build a church in such part of the country as the trustees may think proper, as a memorial to the testatrix's husband.

A New School at St. Peter's, Rochester, is now being erected. It is situated in Holcombe Road (leading out of Cecil Road), Delce, and is to accommodate 160 infants. The total cost will be £1,850. Mr. G. E. Bond is the architect, and Mr. G. West the builder.

"**The Parish and its Bounds**" is the title of an interesting pamphlet by Messrs. Bernay & Son, architects and surveyors, of 104, George Street, Croydon, which they have just published dealing with the origin of parishes and the ancient custom of perambulating their boundaries, commonly known as "beating the bounds."

The New Chancel of St. Mark's Church, Newtown, was consecrated recently. It contains an organ-chamber and choir stalls, and is of the early geometrical type of architecture, the architects being Messrs. Heaton, Ralph & Heaton of Wigan. It has been built at a cost of £2,900.

Underground Electric Traction.—The joint committee now considering the question of electric traction on the two London underground railway companies are stated to be in favour of the adoption by the Metropolitan of the Gavry system, while the Metropolitan District will be recommended to adopt an American system in use on the elevated lines in New York and Chicago.

A New Jewish Synagogue.—The foundation stone of a new synagogue in Princess Road, Finsbury Park, was laid last week. The new building, which, when completed, will be the northernmost synagogue of the Metropolis, takes the place of temporary premises in Portland Road. When completed it will provide accommodation on the ground floor for 190 gentlemen, and in the galleries for 144 ladies. Mr. Delissa Joseph, F.R.I.B.A., is the architect, and the work of construction is being carried out by Messrs. L. Whitehead & Co. It will be built in red bricks, relieved with stone dressings.

Machen Church has been reopened after restoration. The work, which was carried out under the direction of Mr. C. B. Fowler, F.R.I.B.A., of Cardiff, included the provision of almost new roofs. The old ceiling has been removed, and a wooden ceiling substituted with moulded ribs. The old west gallery was removed, and new pews, pulpit, and desk fixed, whilst a portion of the walls were rebuilt. The plaster has been taken off the interior and exterior walls, and the masonry pointed. The square tower has also been restored, and a new ringing floor provided. During the progress of this work several finds of interest were made. Chief of these were rood-loft steps and entrances, three niches, an old piscina, a west window opening, the remains of a rood screen, and a priest's doorway in the chancel. New ventilating and heating apparatus has been installed.

The Baptist Church House—a project resulting from the Twentieth Century Fund—is now being erected in Furnival Street, Holborn. The Baptist Union finds the need of more room for administrative purposes. The premises will provide accommodation for the Baptist Missionary Society, the Baptist Union denominational meetings, and will serve as a Baptist centre for the entire country. It will occupy part of the site of Kingsgate Street Baptist Chapel, originally erected in 1736, and will have a frontage of 80ft. to Southampton Row when widened as part of the Holborn-to-Strand street improvement of the London County Council. The facade will be in stone, and a clock tower is to surmount its centre. There are to be two blocks, the front block comprising office accommodation, council chamber, committee-rooms, visitors' room, and publication department. At the rear a new Kingsgate Street Chapel will arise, with a Sunday-school beneath, and a large library, the latter also to serve as a meeting-place. The sum of £30,000 has been appropriated out of the Twentieth Century Fund towards the building.

Sunderland Borough Sanatorium.—A new pavilion has been erected at the Sunderland Borough Sanatorium for Infectious Diseases, consisting of two ten-bedded wards and two single-bedded wards. The cost, including furnishing, will be about £5,000. This pavilion will be the fourth, and there is now accommodation for 262 patients, at the rate of 2,000 cub. ft. per patient.

St. Paul's Church, Thornton Heath, is being enlarged by the addition of a new nave and aisles, designed by Mr. R. Philip Day, the diocesan architect, and being built by Messrs. D. Stewart & Sons, of Wallington. The addition will provide accommodation for 700 people, making the full accommodation 1,000. The building is in the Decorated style with open roof and ornamental columns dividing the aisles. It is faced with stone, has Bath stone dressings, and will be roofed with red tiles. The foundation stone, which has just been laid, is in the baptistery, a bay-shaped structure under the west window. The cost is estimated at £6,500.

A New Public Library and Museum at Kilmarnock, to be known as the Dick Institute, was formally opened recently. The building has been erected at Elmbank. The style of architecture adopted is Italian. The front portion is two storeys in height, and the return wings are one storey, the frontage being 138ft. in length, with a total depth of 114ft. The building has fourteen apartments, including a lecture-hall capable of accommodating 500 people. The museum contains the valuable geological collection given to the town by the late Mr. James Thomson, F.G.S., and also a considerable portion of the unique Braidwood collection, left by the late Dr. Hunter-Selkirk. Mr. R. S. Ingram is the architect.

The London and Middlesex Archæological Society paid a visit recently to the churches of Bow and Stepney with the object of studying their architectural and other remaining antiquities. The visitors were received at Bow Church by the rector, who had invited Mr. Hills, the architect from whose designs the restoration work of the church had been carried out, to conduct them over the building. Mr. Hills gave an account of the work, saying that it had been most difficult, in consequence of the soft nature of the stone, which in places had become decayed. Red tiles had been used to mark the division of the old stonework from the new, and the moulding of the latter had been accurately obtained from the mutilated remains of the old building. The old timber roof of the chancel was found to be in an advanced state of decay at the time of the restoration, and great care and expense were necessitated in saving this part of the sacred edifice. The chancel roof was of the same date as the church—the fifteenth century. At Stepney the restoration of the church was far more satisfactory than in the previous case, as the stone was of good quality.

A Sailor's Home at Chatham is now in course of construction on a spacious site near the Drawbridge Road, adjoining St. Mary's National Schools, and close to the Town Hall, Chatham. It is intended to construct a pile of buildings covering an area of 165ft. by 245ft., and including a central hall 100ft. by 48ft., billiard and retiring rooms, and some 600 cubicles. The building now in hand is only a sixth part of the whole scheme. It has a frontage of 88ft. to the Upper Drawbridge Road, and a depth of 50ft. It is set back 50ft from the road, and it will ultimately have a lawn in front and be approached by two carriage drives. The building will be constructed of stock bricks with stone and red brick dressings. It is to be four storeys high, and provision is made in the basement for a spacious kitchen, bath-rooms, pantries, scullery, beer cellar and various stores and offices. On the ground floor there are separate rooms for petty officers and men, with buffet and manager's offices. The first and second floors, overlooking the Drawbridge Road, will contain fifty-two cubicles, each 8ft. by 5ft. 6in. The building is to be heated by hot water. The architect is Mr. G. E. Bond, and the builder Mr. H. E. Phillips, of New Brompton, the contract price being £5,195.

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Registered April 15th to acquire the freehold estates, comprising 350 acres or thereabouts, of A. G. D. Bernacchi, situate in Maria Island, Tasmania, on which the township of Darlington is established, and to carry on the business of cement, lime, plaster, and artificial stone manufacturers, brick and tile makers, quarry-owners, &c. Capital £10,000 in £1 shares. The first directors are M. Cohen, A. G. D. Bernacchi and D. R. Hallam.

Penydarren Brick and Coal Company, Ltd.

Registered April 22nd to acquire from W. Williams all his interest under an indenture of lease between the Aberdare and Plymouth Company, Ltd., and David Williams, being a lease of minerals under the Penydarren Estate, Merthyr Tydfil, Glamorganshire, and to carry on the business of colliery proprietors, coke manufacturers, brick and tile manufacturers, engineers, &c. Capital £5,000 in £1 shares. The first directors are S. R. Fothergill, H. C. Devereux, W. Griffiths and W. Lewis.

Northwood Brick and Marl Co., Ltd.

Registered April 26th to adopt an agreement with H. I. Williams, T. E. Storey and H. B. Steele to explore, work, and turn to account the land, fireclay, marl, brick earth, &c., and to carry on the business of stone, clay, marl, coal, and iron-stone workers, brick and tile manufacturers and merchants, contractors, &c. Capital £5,000 in £1 shares. The first directors are H. I. Williams, T. E. Storey and H. B. Steele. Registered office: Northwood Brick and Marl Works Queen's Road, Hanley, Staffordshire.

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Special attention is directed to the three new insurance schemes which we have instituted. Particulars will be found on page 270 of this issue.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
May 10	Bradford—Villa		J. F. Walsh & G. Nicholas, Lancs. and Yorks. Bank Chambers, Halifax.
„ 10	Oswestry—Rebuilding	Standing Joint Committee	A. T. Davis, County Surveyor, Shirehall, Shrewsbury.
„ 10	Lancaster—House	H. G. Smith	J. Parkinson, 67 Church Street, Lancaster.
„ 10	Salford—Strengthening Wall, &c.	Water Committee	Borough Engineer's Office, Salford.
„ 10	Stapleton—Sanitary Annex	Guardians of the Poor	J. J. Simpson, St. Peter's Hospital, Bristol.
„ 10	Donegal Square West—Completion	Directors	Young & Mackenzie, Scottish Provd. Buildings, Belfast.
„ 11	Lichfield—School	Governors	H. Smith, 111 Finsbury Pavement, London, E.C.
„ 11	Uxbridge—Wall, &c.	Burial Board	W. L. Ives, 54 High Street, Uxbridge.
„ 11	Broighter, Ireland—House	Rev. W. Kane	M. A. Robinson, Richmond Street, Londonderry.
„ 11	Falmouth—School		O. Caldwell, Architect, Penzance.
„ 11	St. Agnes, Cornwall—Vestry, &c.		S. Hill, Architect, Redruth.
„ 11	Walpole St. Andrew, Norfolk—Alterations, &c.	W. & T. Bagge	H. Tilson, Architect, Railway Road, Lynn.
„ 11	Westbury, Wilts—Bathrooms	Board of Guardians	W. H. Stanley, Market House Chambers, Trowbridge.
„ 11	Newton, Oystermouth—Church	Rev. H. Williams	E. M. B. Vaughan, Architect, Cardiff.
„ 13	East Grinstead—Workmen's Dwellings	Urban District Council	R. Wilds, Urban Council Offices, East Grinstead.
„ 13	Kirkcaldy—Tramways, &c.	Corporation	W. L. Macindoe, Town Clerk's Office, Kirkcaldy.
„ 13	Bishop's Stortford—Board School, &c.	Gas Co., Ltd.	Manager's Office, Gasworks, Bishop's Stortford
„ 13	Birkenhead—Alterations	Guardians	E. Kirby, 5 Cook Street, Liverpool.
„ 13	Butler Green, near Oldham—Police Station	Standing Joint Committee	H. Littler, Architect, County Offices, Preston.
„ 13	Falmouth—Building		W. Swift, Architect and Surveyor, 4 Princess Street, Truro.
„ 13	Rowlands Gill, near Newcastle—School		J. P. Allen, Victoria Buildings Grainger Street, Newcastle-on-Tyne.
„ 13	Patricroft—Public Baths	Borough Council	H. Lord, 42 Deansgate, Manchester.
„ 14	Abingdon—School Buildings	School Board	F. Morland, 33 Bath Street, Abingdon.
„ 14	London, E.C.—Slates, &c.	Great Eastern Railway Co.	Secretary's Office, Liverpool Street Terminus, E.C.
„ 14	St. Petersburg—Embankment	Town Council	Offices of the St. Petersburg Town Council (Stadtamt).
„ 15	Eastbourne—Alterations	Lighting & General Purposes Committee	W. C. Field, Borough Architect, Town Hall, Eastbourne.
„ 15	Edgware, Middlesex—Alterations	Guardians	F. G. Seabrook, Union Offices, Edgware.
„ 15	Brentwood, Essex—Cottages	Urban District Council	C. E. Lewis, Clerk, Brentwood.
„ 15	Grayrigg, Kendal—Addition	W. Thompson	S. Shaw, Architect, Kendal.
„ 15	Halifax—Additions	Tramways and Electricity Committee	J. Lord, Borough Engineer, Town Hall, Halifax.
„ 15	North Skelton, Yorks—Station Buildings	North-Eastern Railway Co.	Stationmaster, Middlesborough.
„ 15	St. John's Hill, S.W.—Extension	Guardians	Lansdell & Harrison, 38 Bow Lane, Cheapside, E.C.
„ 16	Netherwitten—Cloak Room, &c.	School Board	School House, Netherwitten.
„ 16	Lochgelly—School Buildings	School Board	W. Birrell, Architect, Cupar & Kirkcaldy.
„ 16	Newcastle on-Tyne—School	School Board	S. D. Robin, 110 Pilgrim Street, Newcastle-on-Tyne.
„ 16	Dursley—Engine House, &c.	Rural District Council	J. Taylor, Sons & S. Crimp, Civil Engineers, Dursley.
„ 16	Egremont—Bricks	Wallasey Urban District Council	Engineer's Office, Great Float, near Birkenhead.
„ 17	Desborough—House and Shops		D. J. Diver, Desborough.
„ 17	Downpatrick—Hospital	District Lunatic Asylum	S. Rea, Clerk, Asylum, Downpatrick.
„ 17	Southwark Park—Conveniences, &c.		Architect's Department, County Hall, Spring Gardens, S.W.
„ 18	Billingshurst—Houses		W. Buck, Architect, Horsham.
„ 18	Luton—Homes	Guardians	B. B. Franklin, 21 Market Hill, Luton.
„ 18	Cardiff—Foundations		E. W. M. Corbett, Castle Street, Cardiff.
„ 18	Cardiff—Hospital		E. W. M. Corbett, Castle Street, Cardiff.
„ 18	Mardy, Wales—Chapel, &c.	Trustees	J. Ll. Smith & Davies, Architects, Aberdare.
„ 20	Sedgley—Extensions	School Board	A. Ramsell, 187 Wolverhampton Street, Dudley.
„ 20	London, N.—Buildings	Urban District Council of Hornsey	E. J. Lovegrove, Engineer to the Council, Hornsey.
„ 20	Dartford, Kent—Repairs, &c.	Asylums Board	Office of the Board, Embankment, E.C.
„ 22	Leeds—Market Hill, &c.	Market Committee	Leeming & Leeming, Town Hall, Leeds.
„ 23	Redruth—Business Premises	W. G. Wilton	S. Hill, Architect, Green Lane, Redruth.
„ 22	Halifax—Houses		R. Horsfall & Son, 22a Commercial Street, Halifax.
„ 22	Rotherhithe, S.E.—Male Staff Quarters	Asylums Board	Aldwinckle & Son, 20 Denman Street, London Bridge, S.E.
„ 23	Walthamstow—Four Shops	Trustees	W. A. Longmore, Bridge Chambers, Hoe Street, Walthamstow.
„ 24	Halifax—Houses		M. Hall, Architect, Halifax.
„ 27	Burgos, Spain—Market Buildings		Commercial Department, Foreign Office, Madrid.
„ 29	Holne, Devon—Reservoir, &c.	Paignton Urban District Council	F. W. Vanstone, Palace Chambers, Paignton.
	ENGINEERING:		
May 10	Dewsbury—Tanks		C. H. Marriott, Son & Shaw, Engnrs., Church St. Chmbrs., Dewsbury.
„ 10	Baddesley, Ensor, nr. Atherstone—Waterworks		Willcox & Raikes, 63 Temple Row, Birmingham.
„ 10	Madrid—Telephone System	Spanish Post Office	Commercial Department, Foreign Office, Madrid.
„ 11	Dundee—Electrical Plant	Gas Commissioners	W. H. Tittensor, Dunhope Crescent Road, Dundee.
„ 11	Leeds—Steam Engine	Gas Committee	R. H. Townsley, General Manager, Gasworks, Leeds.
„ 11	Swinton, Lancs.—Bacteria Filters	Urban District Council	H. Entwisle, Surveyor, Council Offices, Swinton.
„ 13	Stanmoor, Somerset—Bridge	Drainage Commissioners	W. Lunn, Queen Street, Bridgwater.
„ 13	Clevedon, Somerset—Pumping Machinery	Water Company	J. Mansergh, 5 Victoria Street, Westminster.
„ 13	Kirkcaldy—Tramways	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„ 13	Armagh—Water Supply	Committee	Dorman, Court House, Armagh.
„ 14	London, S.W.—Wiring	Battersea Borough Council	W. M. Wilkins, Municipal Buildings, 1 Lavender Hill, S.W.
„ 14	Workington—Waterworks	Corporation	J. Eden 58 Row Street, Workington.
„ 15	Chapel-en-la-Frith—Waterworks	Rural District Council	Sterling & Swann, Town Hall, Chapel-en-le-Frith.
„ 15	Edgware, Middlesex—Machinery	Guardians	F. J. Seabrook, Union Offices, Edgware.
„ 15	Swansea—Alterations, &c.	Corporation	Guildhall, Swansea
„ 16	Rochdale—Dynamos	Corporation	Lacey, Chiehugh & Sillar, 78 King Street, Manchester.
„ 17	Stokestown, Ireland—Repairs	Guardians	T. Murray, Clerk, Stokestown.
17	Rotherham—Gasholder	Gas Committee	Engineer, Gas Offices, Rotherham.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		IRON AND STEEL:		
May	10	Shrewsbury—Girders	Joint Com. of L. & N.W. & G.W.R. Co.'s	Joint Engineer, Woodside Station, Birkenhead.
"	10	Pentre, Glamorgan—Gas Mains, &c.	Urban District Council	O. Thomas, Gas and Water Office, Pentre, R.S.O., Glam.
"	13	Guildford—Pipes	Town Council	C. G. Mason, Borough Surveyor, Tuns Gate, Guildford.
"	13	South Lancashire—Rails, &c.	Electric Traction and Power Co., Ltd.	Kincaid, Waller & Manville, 29 Great George Street, Westminster.
"	13	Liverpool—Rails, &c.	Electric Traction and Power Co., Ltd.	Kincaid, Waller & Manville, 29 Great George Street, Westminster.
"	14	London, E.C.—Iron and Pipes, &c.	Great Eastern Railway Company	Secretary's Office, Liverpool Street Terminus, E.C.
"	16	Egremont, Cheshire—Pipes, &c.	Urban District Council	Engineer's Office, Works, Gt. Float, near Birkenhead.
"	18	Newcastle-on-Tyne—Rails, &c.	Corporation	City Engineer, Town Hall, Newcastle-on-Tyne.
"	21	Coventry—Manhole Covers, &c.	Corporation	J. E. Swindlehurst, City Engr. & Survyr. St. Mary's Hall, Coventry.
		PAINTING AND PLUMBING:		
May	10	York—Painting	Board School	Board's Office, York.
"	11	Dewsbury—Colouring and Painting	Corporation	Borough Surveyors' Office, Town Hall, Dewsbury.
"	15	London, S.E.—Painting	Guardians of Lambeth	Guardians' Office, Brook Street, Kennington Road, S.E.
"	15	West Norwood—Painting	Guardians	W. Thurnall, Guardian's Brd Room, Brook St., Kennington Rd., S.E.
"	16	Egremont, Cheshire—Oils, &c.	Urban District Council	Engineer's Office, Works, Gt. Float, near Birkenhead.
"	20	Dartford, Kent—Painting, &c.	Asylums Board	Office of the Board, Embankment, E.C.
"	22	Chesterfield—Painting, &c.	Guardians	A. J. Moore, Ashgate Road, Chesterfield.
		ROADS AND CARTAGE:		
May	10	Sunderland—Road Material	Rural District Council	T. Young, Council Office, Sunderland.
"	10	Guisborough—Street-making	Urban District Council	R. H. Kilburn, Surveyor to the Council, Guisborough.
"	11	Alnwick—Materials, &c.	Rural District Council	J. Short, District Surveyor, Alnwick.
"	11	Bradford—Road Metal	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford.
"	11	Swindon—Asphalte Footpaths	Corporation	H. J. Hamp, Borough Surveyor, Town Hall, Swindon.
"	11	Worsbrough, Yorks—Street Works	Urban District Council	J. Whitaker, Surveyor, Worsbrough.
"	13	Hindley, Leeds—Street Works	Urban District Council	A. Holden, Council Offices, Cross Street, Hindley.
"	14	Hertford—Kerbing, &c.	Corporation	J. H. Jevons, Borough Surveyor, Hertford.
"	15	Poole—Granite	—	J. Elford, Borough Surveyor, Poole.
"	15	Newmarket—Road Metalling, &c.	Urban District Council	S. J. Ennion, Clerk, Deva Chambers, Newmarket.
"	15	High Wycombe—Street Works	Corporation	T. J. Rushbrooke, Borough Surveyor, Easton Road, High Wycombe.
"	17	Castle Donington, Derby—Materials &c	Rural District Council	J. W. Newbold, Clerk, Becket Street, Derby.
"	18	Norwich—Street Works	—	A. E. Collins, City Engineer, Guildhall, Norwich.
"	22	Barnes—Roads	—	F. & W. Stocker, 90 & 91 Queen Street, Cheapside, E.C.
		SANITARY:		
May	13	Darton, near Barnsley—Scavenging	Urban District Council	S. Taylor, Sanitary Inspector, Darton.
"	13	Newport, Salop—Sewerage Works	Urban District Council	J. S. Underhill, Urban D.C. Officer, Newport, Salop.
"	13	Wednesbury—Sewerage Works	Corporation	Borough Surveyor, Town Hall, Wednesbury.
"	14	Bingley, Yorks—Scavenging	Urban District Council	A. Platts, Clerk, Town Hall, Bingley.
"	14	Ilfracombe—Sewers, &c.	Urban District Council	Engineer and Surveyor, Town Hall, Ilfracombe.
"	15	Morecambe—Sewerage Works	Urban District Council	Engineer's Office, 11 Cedar Street, Morecambe.
"	16	Naas, Ireland—Sewerage Works	Rural District Council	F. Bergon, Engineer, Kildare.
"	18	Manchester—Supplies	Sanitary Committee	Medical Officer, Public Health Office, Town Hall, Manchester.
"	20	Bury, Lancs.—Sewer	Sewage Committee	A. W. Bradley, Borough Engineer and Surveyor, Bury, Lancashire.
"	20	Watford, Herts—Sanitary Works	Asylums Board	Office of the Board, Embankment, E.C.
		TIMBER:		
May	15	York—Timber Blocks	N. E. Railway Co.	Secretary, York.
"	20	London, E.C.—Firewood	School Board	Contracts Sub-Deptmnt., Schl. Bd. Offices, Victoria Embnkmnt. W.C.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
May	16	Darvel, Scotland—School	—	A. Cameron, Solicitor, Newmilns.
"	17	Hereford—Alterations of Workhouse Buildings	25 guineas each.	T. Llanwarne, St. John Street, Hereford.
"	27	Aldershot—Schools	—	N. Clinton, Clerk to the Board, Station Road, Aldershot.
June	8	Buxton—Water Pump	£20, £10, and £5 respectively.	W. H. Grieves, Town Surveyor, Town Hall, Buxton.
"	10	Ennis, co. Clare—Additions, &c. to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
"	24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100 respectively	W. H. Talbot, Town Clerk, Town Hall, Manchester.
"	24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
"	30	Hereford—Municipal Buildings	£100, £75, £50	J. Carless, Offa Street, Hereford.
July	31	Manchester—Fire Station and Police Station	£300, £200 and £100 respectively	W. H. Talbot, Town Hall, Manchester.
No date		Gillingham—School	£10, £5	E. T. Atchison, 28 Waterloo Road, New Brompton.
"		Darlington—Row of Shops and Dwelling Houses	—	Borough Surveyor, Town Hall, Darlington.
"		Salford—Machinery	£50	Borough Engineer, Town Hall, Salford.

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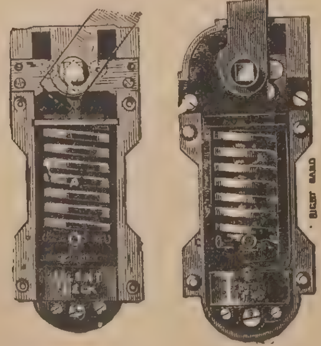


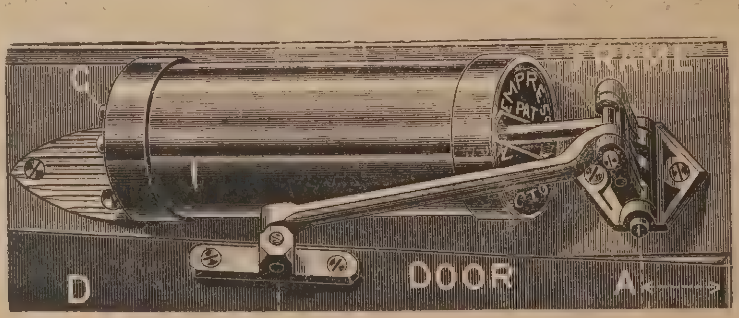
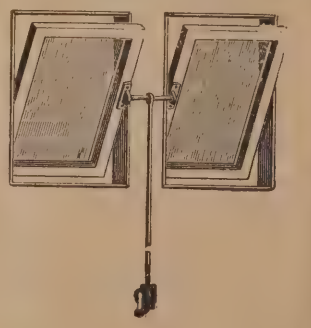


Fig. 1, as fixed on face of door.



TENDERS.

Information from accredited sources should be sent to; "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ABERDEEN.—Accepted for the erection of the new Greyfriars Church, at the corner of Queen Street, for the Aberdeen Town Council. Mr. A. Marshall Mackenzie, A.R.S.A., architect, Union Street, Aberdeen :—

Mason—Messrs. Pringle & Slessor, Aberdeen	£7,299	0	0
Plaster—Messrs. Stephen & Sons, Aberdeen	177	13	0
Joiner—Messrs. D. M'Andrew & Sons, Aberdeen	1,030	0	0
Painter—Mr. John Whyte, Aberdeen	134	0	0
Slater—Messrs. Adam & Co. Aberdeen	88	5	0
Electric Lighting—Mr. A. G. Elmslie, Aberdeen	98	0	0
Ironwork—Messrs. Bladen & Co., Glasgow	126	2	8
Heating—Messrs. Shirras, Laing, & Co., Aberdeen	122	0	0

Plumber—Mr. John Dean, Queen Street, Aberdeen, who pays £50 10s. for permission to do the work, getting, in return, all the old material in the way of pipes, &c., in the houses which are to be demolished. The same holds good in the case of the other contractors, although the material available for them is not so valuable as in the case of the plumber's contract.

[Total, £9,010 10s. 8d.]

BRIDLINGTON.—For the erection of stables, &c., for Mr. J. Burrell. Mr. J. Earnshaw, architect, Wellington Road, Bridlington :—

W. Barnes	£1,576	0	T. Atkin	£1,345	0
E. Corner	1,475	10	T. Spink	1,324	0
E. Wilson	1,401	14	Blackburn & Son	1,274	10
Sampson & Liddall	1,359	3			

[All of Bridlington.]

BRIGHTON.—For the enlargement and alteration of the Hanover Terrace School, for the Brighton and Preston School Board (U.D.) :—

Sattin & Evershed, Freshfield Road	£7,331
Rowland Bros., East Street, Horsham	7,217
Cook & Sons, Crawley, Sussex	7,002
W. A. Field & Co., 20 Preston Street	6,565
H. J. Penfold, 219 Preston Road	6,481
G. R. Lockyer, King Street	6,479
J. Barnes,* 100 North Street	6,215

[Rest of Brighton.]

* Accepted.

CHELMSFORD.—For constructing new sewerage scheme for the Corporation of Chelmsford. Mr. G. H. Sasse, engineer :—

Meston & Hale, Harlesden	£6,105	5	0
F. Johnson, Chelmsford	4,986	0	0
S. Saunders, Earl's Court	4,739	0	0
J. Burrell, Manor Park	4,569	18	6
G. Double, Ipswich	4,559	10	0
J. Jackson, Plaistow	4,433	17	0
H. Potter, Chelmsford	4,393	0	0
D. T. Jackson, Barking	4,144	3	2
A. T. Catley, Lloyd Square	4,071	0	0
Wilson, Border, & Co., Ilford	3,834	13	3
G. Burgoyne & Son, Ipswich	3,782	0	11
J. & J. Jones, Prittlewell	3,764	5	2
J. Jackson,* Forest Gate	3,529	10	11

* Accepted.

CARNARVON.—For the erection of semi-detached villas at the corner of St. David's and Warfield Roads, Carnarvon, for the Committee of Castle Street Wesleyan Chapel, Carnarvon. Mr. Rowland Lloyd Jones, architect, 14 Market Street, Carnarvon :—

Jones, Roberts, and Jones, Pwllheli	£2,252	0	0
Jones & Williams, Pendref, Bangor	2,037	0	0
R. Jones, Llanwrda	1,802	14	9
E. Parry, Carnarvon	1,782	0	0
Jones Bros., Bontnewydd, near Carnarvon	1,780	0	0
Roberts & Williams, Bodgwilym, Penygroes, R.S.O.	1,370	0	0
Williams & Roberts,* Carnarvon	1,380	0	0

* Accepted.

DENSTONE (HANLEY, STAFFS).—For the erection of new sick wards at Denstone College. Messrs. R. Scrivener & Sons, Hanley, architects :—

Bagnall, Fenton	£2,207
Alcock, Cheadle	2,207
Fielding, Alton	2,190
Ward & Son, Uttoxeter	2,026
Horley, Ashbourne	1,998
Tompkinson & Bettelley, Longton	1,997
Godwin,* Hanley	1,810

* Accepted.

DEVONPORT.—For alterations to business premises, 17 William Street, for Mr. C. F. Hocking. Mr. Edgar M. Leest architect, Public Hall Chambers, Devonport :—

W. E. Blake	£576	0
W. Littleton	536	10
G. B. Turpin	494	0
G. H. Smith & Son	487	15
T. Jenkin & Son,*	475	0

* Accepted.

FISHGUARD (PEMBROKE).—For the erection of new schoo buildings and premises at Fishguard, in the county of Pembroke for the Managers :—

T. Davies & Son, Bridge Street, Haverfordwest	£1,649	0
W. T. Edwards, Penslade, Fishguard	1,570	0
D. J. Davies, Newport	1,547	10
J. Evans, Llanybyther, Carmarthenshire	1,465	0
D. Roberts,* Sycamore Lodge, Fishguard	1,416	0

* Accepted.

FLEET (HANTS).—For the erection of a new Capital and Counties branch bank. Messrs. Clamp and Drower, Victoria Chambers, Woking, Surrey, architects :—

Thompsett & Co., Farnham	£3,450
Garland, Aldershot	3,048
G. Kemp, Aldershot	2,979
Poulter Bros., Fleet	2,835
Goddard & Sons,* Farnham	2,830

* Accepted.

GATESHEAD.—For the erection of the Kelvin Grove School, for the Gateshead School Board. Mr. J. Landell Nicholson, architect, 55 Northumberland Street, Newcastle :—

W. C. Tyrie, Gateshead	£12,196	5	8
S. Sheriff, South Shields	12,005	18	1
T. & R. Lamb, Gateshead	11,869	7	7
T. Weatheritt, Newcastle	11,694	5	11
J. C. Hope, Newcastle	11,662	11	8
J. Bewley, Dunston	11,265	6	10
T. George, Newcastle	11,236	14	0
J. Elliott, North Shields	10,670	0	0
W. Foster, Pelaw	10,459	0	0
T. Hunter,* Washington	9,959	10	0

* Provisionally accepted.

GATESHEAD-ON-TYNE.—For the erection of school buildings, caretaker's house, boundary walls and latrines, Kelvin Grove, for the Gateshead School Board. Mr. J. Landell Nicholson, architect, 55 Northumberland Street, Newcastle-on-Tyne :—

W. C. Tyrie, Gateshead	£12,196	5	8
S. Sheriff, South Shields	12,005	18	1
T. & R. Lamb, Gateshead	11,869	7	7
T. Weatheritt, Newcastle	11,694	5	11
J. C. Hope, Newcastle	11,662	11	8
J. Bewley, Dunston	11,265	6	10
Thomas George, Newcastle	11,236	14	0
J. Elliott, North Shields	10,670	0	0
W. Foster, Telaw	10,459	0	0
Thomas Hunter,* Washington	9,959	10	0

* Provisionally accepted.

ISLEWORTH.—For proposed lime and cement warehouses, river-wall, pavings, alterations, and reparations to premises, Lower Square, Isleworth, for Messrs William Lee, Son, & Co., Limited. Mr. Henry Poston, architect, 39 Lombard Street, E.C, Quantities supplied :—

Mowlem & Co.	£3,490
Killby & Gayford	3,423
Todd & Co.	3,419
Hall, Beddall, & Co.	3,389
Blyton & Sons*	3,269

[Architect's estimate, £3,350.]

* Accepted.

KIRKCALDY.—Accepted for the erection of sanitary conveniences at Pathhead Public School for Dysart Burgh School Board. Mr. D. Forbes Smith, A.R.I.B.A., architect. Quantities by the architect :—

Mason—Balfour Bros., Sinclairtown	£50	6	3
Joiner—David Wishart, Pathhead	28	8	0
Plumber—James Robb, Dysart	49	11	7
Plasterer—H. Masterton, Sinclairtown	26	0	0
Slater—Robert Page, Pathhead	5	10	0

[Total, £159 15s. 10d.]

KIRKCALDY.—Accepted for the erection of 20 workmen's houses at Boreland for The Earl of Rosslyn's Collieries, Limited. Mr. D. Forbes Smith, A.R.I.B.A., architect. Quantities by the architect :—

Mason—David Wilkie, Sinclairtown	£891	14	6
Joiner—Thomas Millar, Kirkcaldy	819	0	0
Plasterer—Alexander Hutchinson, Sinclairtown	166	0	0
Plumber—James Robb, Dysart	157	14	9
Slaters—Currie & Cant, Kirkcaldy	100	0	0

[Total, £2,134 9s. 3d.]

KIRKCALDY.—Accepted for the erection of a billiard room at "The Laurels," Sinclairtown, for Mr. David McLaren. Mr. D. Forbes Smith, A.R.I.B.A., architect. Quantities by the architect :—

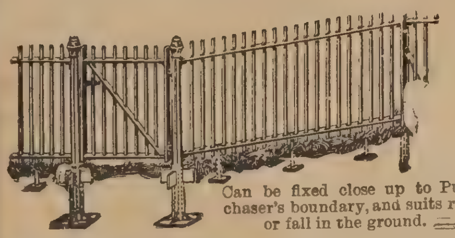
Mason—David Wilkie, Sinclairtown	£189	16	6
Joiners—George Hay & Son, Dysart	178	18	11
Plasterer—H. Masterton, Sinclairtown	54	15	0
Plumber—J. Crombie, Sinclairtown	15	10	6

[Total, £439 0s. 11d.]

LICHFIELD (STAFFS).—For the erection and completion of two semi-detached villas on the Trent Valley Road, Lichfield, for Mrs. Heath and Mr. T. Heath. Mr. J. W. Goddridge, architect, 4 Bolebridge Street, Tamworth :—

W. H. Gibbs, King's Heath	£1,975
T Walmsley, Lichfield	1,950
E. Williams, Tamworth	1,900
B. Musson,* Glascote, Tamworth	1,850
Dent & Son, Tamworth	1,775

* Accepted on reduction.



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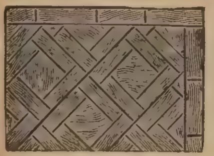

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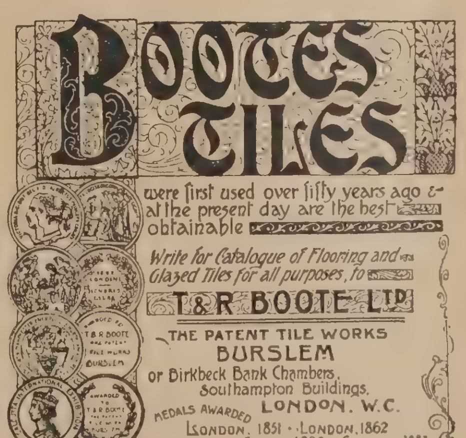

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LLANRUG (near CARNARVON).—For the erection of a new C. M. Chapel at Tanycoed, Llanrug, near Carnarvon. Mr. R. Lloyd Jones, architect, 14 Market Street, Carnarvon:—

	£	s.	d.
H. Hughes, Newborough, Anglesey	£1,160	0	0
Williams & Roberts, Carnarvon	1,099	0	0
R. Jones,* Llanwdra	1,059	8	4
O. O. Williams & J. Roberts, Springford Works, Bethesda	1,059	0	0
H. Morris, Bronturnor, Llanllyfni	1,015	0	0
O. Owens & Co., Cwmyglo, R.S.O.	1,004	0	0

* Accepted.

LONDON.—Accepted for the erection of shops at East Ham, London, E., Mr. Herbert Riches, architect, 8 Crooked Lane, King William Street, E.C.:—

Sheffield Bros.	£3,120

LONDON.—For work at "The Neville Arms," Stoke Newington, London, N. Messrs. Foulsham & Herbert Riches, architects, 3 Crooked Lane, King William Street, E.C., and Bromley-by-Bow, E.:—

	£	s.
T. J. Dartnell	£302	10
C. Chapman	295	0
J. T. Robey	293	0

LONDON, E.—For proposed rifle-testing range at the London Small-Arms Company's Works, Gunmakers' Lane, Old Ford, E., for the London Small-Arms Company, Limited. Mr. Henry Poston, architect, 39 Lombard Street, E.C. Quantities supplied:—

Hall, Beddall, & Co.	£3,900	W. J. Maddison	£3,823
Mowlem & Co.	3,879	Todd & Co.	3,772
Blyton & Sons	3,839		

[Architect's estimate, £3,950.]

LONDON, N.—For alterations, &c., to the Stamford Hill Congregational Church. Mr. W. W. Baldwin, architect:—

Dove Bros.	£6,277	Higgs & Hill	£5,734
Kilby & Gayford	6,067	F. & F. J. Wood	5,728
W. Shurmur	6,065	Chessum & Son	5,668
T. Emmett	5,889	Jarvis & Son	5,320
Grover & Sons	5,836	Harris & Wardrop	5,146

LONDON, N.—For the erection of a warehouse, Gifford Street, Caledonian Road. Messrs. Carter & Ashworth, architects:—

Godson & Son	£1,591	W. Shurmur	£1,476
Kirk & Kirk	1,500	Jarvis & Son	1,428
T. Cole	1,498	Mattock Bros.	1,377

LONDON, N.—For the erection of vicarage, &c., St. Augustine's Church, Archway Road, N. Mr. J. S. Alder, architect:—

R. Bentley	£2,520	Voller	£2,248
Roberts	2,444	Turtle & Appleton	2,220
A. Porter	2,388	Castle & Son	2,188
W. Shurmur	2,322	Willmott & Son	2,125
Palmerston	2,321		

NEWCASTLE.—For the erection of a new warehouse and stables, Newcastle-on-Tyne. Mr. H. T. Gradon, architect, Durham:—

	£	s.	d.
T. Weatheritt	£7,338	15	8
J. and W. Lowrey	7,241	12	0
Middlemiss Bros.	6,978	0	0
J. Smart	6,865	14	0
W. T. Weir	6,700	0	0
T. Hutchinson	6,522	4	0
Baty & Co.	6,485	18	9
T. Lumsden	6,450	0	0
J. Jackson	6,213	0	0

UPLEADON (near NEWENT, GLOS.).—For the construction of a covered service reservoir to hold 1¼ million gallons at Upleadon, 2¼ miles from Newent Station (G.W. Ry.), for the Gloucester Corporation. Mr. R. Read, A.M.I.C.E., city surveyor:—

King & Sons, Gloucester	£8,883
Pethick Bros., Westminster and Plymouth	8,280
Wills & Sons, Bath	8,264
S. Wood, Bristol	8,102
Cruwys & Hobrough,* Gloucester and Birmingham	6,963

* Accepted.

COMING EVENTS.

Wednesday, May 8.

IRON AND STEEL INSTITUTE.—Annual Meeting at the Institution of Civil Engineers, Great George Street.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Meetings of General Purposes and Finance Committee at 4 p.m., Election Committee at 5.15 p.m., and Council at 7 p.m.

Thursday, May 9.

IRON AND STEEL INSTITUTE.—Annual Meeting (Second Day).

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Mr. J. S. Highfield on "Storage Batteries in Electric Power Stations, controlled by reversible boosters." 8 p.m.

CARPENTERS' HALL, London Wall (Lectures on Carpentry and Joinery).—Mr. S. Barter on "The Joinery of a Room," 7.30 p.m.

Friday, May 10.

ARCHITECTURAL ASSOCIATION.—Mr. A. Hands on "The Protection of Buildings from Lightning" and election of Officers, 7.30 p.m.

ROYAL INSTITUTION.—Professor Jagadis Chunder Bose on "The Response of Inorganic Matter to Mechanical and Electrical Stimulus," 9 p.m.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

SOCIETY OF ARTS (Howard Lectures).—Mr. Alfred C. Eborall, M.I.E.E., on "Polyphose Electric Working"—III.

Saturday, May 11.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Collingwood Street and Quayside Buildings, Newcastle, 3 p.m.

ARTISTS' GENERAL BENEVOLENT INSTITUTION.—Annual Dinner at Whitehall Rooms, 6.30 p.m.

ROYAL INSTITUTION.—Professor Flinders Petrie on "The Rise of Civilization in Egypt"—I., 3 p.m.

Monday, May 13.

BRISTOL SOCIETY OF ARCHITECTS.—Mr. John Fisher on "The Work of Alfred Stevens," 8 p.m.

SOCIETY OF ARTS (Cantor Lectures).—Mr. T. Kirke Rose, D.Sc., on "Alloys"—IV.

Wednesday, May 15.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

SOCIETY OF ARTS.—Mr. Guglielmo Marconi on "Syntonic Wireless Telegraphy," 8 p.m.

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		£	s.	d.	£	s.	d.
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Iron, Staffs., bar	do.	6	5	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	0	0		—	
Lead, pig, Spanish	per ton	12	7	6		—	
Do. do. English common brands	do.	13	0	0		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do. floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	0	0	6	5	0
Do. Mild Bars	do.	7	0	0	7	10	0
Tin, Foreign	do.	118	10	0	119	0	0
Do. English ingots	do.	121	0	0		—	
Zinc, sheets, Silesian	do.	21	0	0		—	
Do. do. Vieille Montaigne	do.	21	10	0		—	
Do. Spelter	do.	16	16	3	17	7	6

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SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Do. Pitch	do.	2	10	0	2	15	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P.Std.	9	5	0	12	10	0
Do. do. 4th & 3rd	do.	11	15	0	13	5	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	21	0	0		—	
Do. do. 2nd "	do.	19	0	0		—	
Do. do. unsorted	do.	12	15	0		—	
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	9	10	0	12	15	0
Do. White Sea	do.	9	15	0	13	0	0
Do. Quebec Pine, 1st	do.	22	0	0	23	0	0
Do. do. 2nd	do.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0		—	
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	6	10	0	8	17	6
Flooring Boards, 1in. prepared, 1st	per square	0	13	3		—	
Do. 2nd	do.	0	10	6	0	12	9
Do. 3rd &c.	do.	0	8	0	0	8	3

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		£	s.	d.	£	s.	d.
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Colza Oil, English	do.	1	10	0		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	4	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels	do.	1	9	6		—	
Petroleum, American	per gal.	0	0	6⅜	0	0	6⅝
Do. Russian	do.	0	0	6⅛	0	0	6¼
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	2	18	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	5	0	1	6	6
Tar, Stockholm	per barrel	1	6	6		—	

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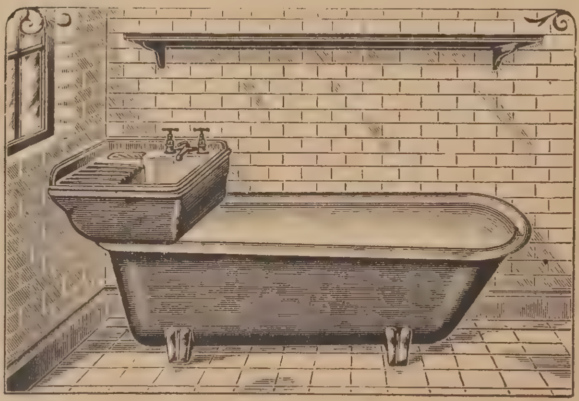

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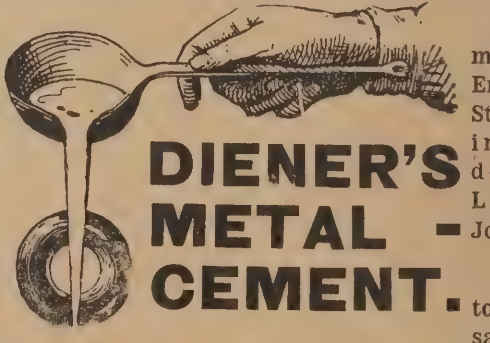

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THE BVILDERS' JOVRNAL & ARCHITECTVRAL RECORD

May 15, 1901.
No. CCCXXVII.

Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

Sculpture at the Royal Academy. It has been stated that of every hundred persons who are "fond of pictures," probably less than twenty take interest in sculpture, and certainly not more than five care anything about architecture. So far as sculpture is concerned, this is perhaps less true now than it was; for with the revival of the sister art of architecture, both in this country and in France, has come a more extended and more intelligent appreciation by the general public, and a greater interest on the part of the entire body of artists Taking the specimens now exhibited at Burlington House as typical of the aims and methods of the bulk of our modern British sculptors, one feature is persistently perdominant, namely, the treatment of pieces of sculpture as isolated works—almost as *objets de vertu*—rather than as forming part of a definite architectural scheme. This view of the art is, of course, a debatable one; but the fact remains that the best sculpture produced in former ages has always been treated as an integral portion of architectural design. Donatello, Ghiberti, Michael Angelo or Luca della Robbia might be cited as examples. Nowadays, however, though the principle still holds good, our sculptors adopt another criterion. It is a common cry –one which we hear regularly at conferences—that the architect, the sculptor, and the painter should collaborate, but it is rarely that such a collaboration is seen in this country, the reason doubtless being attributable to our systems of training, by which each artist, from the very beginning, specialises, instead of first grounding himself in the principles of all the arts and then practising the one for which he feels himself most fitted. In this year's Academy the specimens of sculpture which profess any architectural or decorative treatment can be counted on the fingers of one hand. The most ostentatious is Mr. Onslow Ford's memorial of Queen Victoria, to be erected in Manchester. This shows the great Queen in her robes of state seated on a throne, with the orb in one hand and the sceptre in the other. The background is surmounted by a broken pediment, between the ends of which is a small group representing St. George killing the Dragon. At the reverse side of the memorial stands the figure of a woman holding two babes to her breast, a Corinthian column on either side, and the following words inscribed below: "Let me but bear your love, I'll bear your cares." The whole memorial is displeasing. The great dignity of her late revered Majesty was in voice and manner, not in person, because of her small stature; yet the sculptor, by extending the royal robes at each side, has managed to emphasise this smallness of stature, and the figure is therefore a failure. With regard to the architecture of the memorial, this is sadly lacking in force and skilful treatment; it is a cogent example of what may result from the divorce of the two great sister arts. As pleasing as Mr. Ford's memorial is disappointing is "The Fairy Fountain" (1773), the work of a lady—Miss Rosamond Praeger. This takes the form of a rectangular slab, and is delightfully conceived. In low relief is a little maid who has apparently gone to the well and, tired out, has there fallen asleep, with her head on a stone and a pitcher loosely held in one hand. To the left two joyous elves peer towards the little maid's ear, and typify the course of her dream, while below the stone the water will issue into a small projecting bowl. This fountain is a striking contrast to the somewhat florid effort of Mr. George Simonds entitled "Song and Dance" (1815). Mr. F. E. E. Schenck exhibits two corbels in spandrels (1712 and 1810), the one representing summer—the figure of a woman with corn—and the other representing autumn. Both are well executed. One of the most curious exhibits in the section devoted to sculpture is the portion of the frieze for the marble vestibule at Lloyd's Registry in Fenchurch Street (1791). It is by Mr. F. Lynn Jenkins, and shows ships sailing under a good breeze, with clouds against an iridescent sky, each of the divisions between the panels having the small figure of a woman surrounded by decorative devices. It is the materials used that make this frieze so noticeable. Metal, ivory and mother-of-pearl are combined—metal being used for the ships, the waves and the clouds; mother-of-pearl of different kinds for portions of the waves and for the sky which glimmers between the clouds; and the ivory in the female figures, and here and there throughout the design. It is difficult to form a just conception of the frieze in its present position, but it will doubtless look well when in its proper place. Close to it is a relief of "Dawn" (1787) by Mr. J. Crossland McClure, a most effective piece of work in the manner of that fine sculptor, the late Harry Bates. In the Architectural Room is the bronze canopy for the Dean Colet Memorial to be placed in front of St. Paul's Schools at West Kensington. Here, amid the sculpture, is the group itself (1708), in which Mr. Hamo Thornycroft has been much more happy than in the canopy. The Dean is shown seated on a chair with a book on his lap, while a chorister rests on one knee at each side reading—or about to read—from a book. The statue of Oliver Cromwell, by Mr. Pomeroy (1700), is in the same Central Hall. It is for St. Ives, Hunts., but is not quite so successful as the statue by Mr. Thornycroft which stands so sternly with its back to Westminster Hall (though it may be mentioned that the British Lion on the pedestal, and the pedestal itself, are deplorable). Saverio Sortini exhibits a good design in plaster for a decorated bell (1693), four angels holding up a crown of laurel at the top, and the figure of a praying angel occupying a position on each side of the bell, surmounted, on one side, by a cock crowing, and on the other by a royal eagle. Of the remaining exhibits the majority are busts and statues of eminent men, and emblematical figures, such as Mr. Fehr's "Hesitation" (1697); "The Victory of Peace" (1702), a beautiful female figure by Andrea C. Lucchesi holding a dove to her breast, with the point of the sword in her other hand resting on the ground; "Joyance" (1739), by Mr. Goscombe John; and "The Spirit of Contemplation" (1694), by Albert Toft.

VIEW IN THE ROTUNDA, CITY HALL, NEW YORK CITY. JOHN MCCOMB, ARCHITECT.

It is most difficult to treat the pedestal of a bust successfully. Of the various methods adopted, the most common, and usually the most displeasing, is to cut away the bust in the form of a semicircle and mount it on a small turned pedestal, generally of marble. Mr. Onslow Ford's bust of Sir Frederic Bramwell (1723) is an example of such a treatment. Again, the pedestal may be obscured as much as possible, as in the very fine head of a "Paysan" (1714) by M. Lantéri; or treated as part of the bust, and in the same material, as, for example, the bust of "Doris" (1719) by Miss Gwendolen Williams. Another method is to finish the bust flat and mount it on a pedestal—square or round—larger than the bust itself; Mr. Brock has done this with his bust of Queen Victoria (1820), a very skilful piece of work. Rodin cuts the head out of the top of a block, and leaves the latter in the rough, while still another method was practised in Roman and Renaissance days, that of carving the head at the top of a column or pedestal, and allowing the figure to merge into the latter. It is to be regretted that the least satisfactory treatment is the most common.

In concluding this notice of the sculpture in the Academy we may mention that numerous medallions are shown--though none approach the excellence of French work. A board of bell-pushes and figure-plates (1774) by Mr. Onslow Whiting deserves attention; and those who are advocates for design essentially modern in spirit and subject will doubtless find pleasure in the two figures—straining and struggling—representing "Rugby Football" (1771).

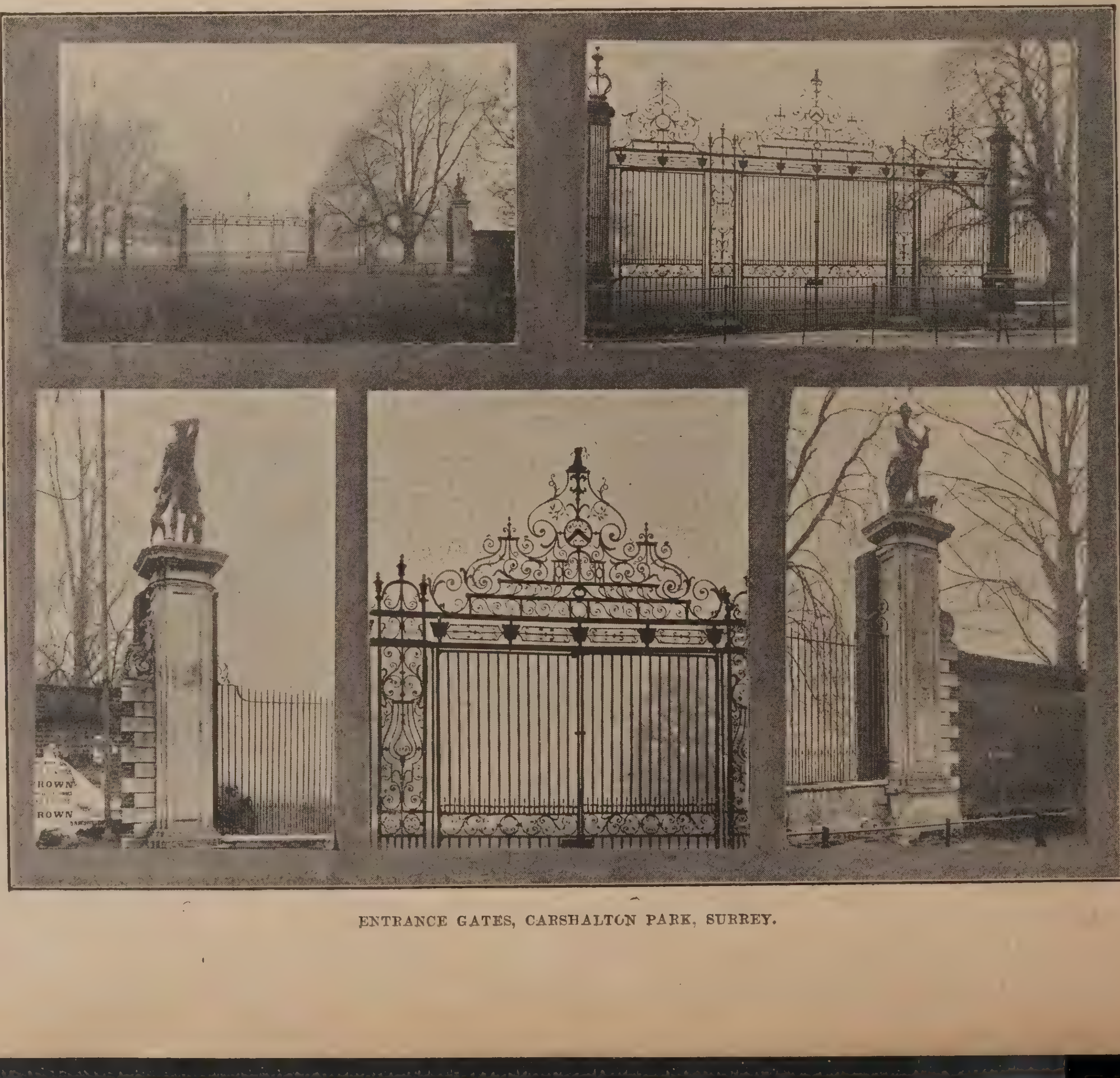
City Hall, New York City. THE view in the Rotunda oi City Hall, New York City, given on the previous page, is taken from "The Georgian Period," a work published by the "American Architect" Company. The City Hall, like the Independence Hall at Philadelphia, and Claymont Court, one of the Virginia houses of the Washington family, belongs to a type which, common enough at the same period in England, is comparatively rare in America. Great city halls presuppose great cities; and there were few towns in New England before Independence which we should reckon greater than an ordinary English village. The Philadelphian State House was among the first, both in time and in size, of a larger kind. New York City Hall was probably designed by John McComb, but a Frenchman in his employ claimed the credit, or some of it. McComb, who survived to the middle of the century just closed, was a warm admirer of Sir William Chambers, and was also influenced by the Brothers Adam. The Hall is of marble and is, "in execution, an advance over earlier buildings in mechanical perfection as well as in monumental design."

York Gate. AT the foot of Buckingham Street, a few paces only from the busy Strand, is a little building which recalls the London of the seventeenth century. Designed by Inigo Jones as a "water-gate" to York House, the residence of the favourite Buckingham, it stood by the water's edge and marked the old bank of the Thames, from which it is now separated by 100 yards, so wide is the strip of land reclaimed by the construction of the Victoria Embankment. Water-gates were numerous then, for the houses of great families lined the southern side of the Strand, and their gardens extended to the river; barges with canopied sterns, manned by rowers in picturesque livery, waited at the stairs, and the side stretch of water was enlivened with sailing craft and small boats. York Gate is one of the earlier works of Inigo Jones after his return from Italy, and a good example of the taste of the day; Italian influence is seen in it throughout. Actually it is a covering for some steps, nothing more; but though small the structure is sufficiently dignified. There is a central arch over a few stone steps, and two smaller ones beside it; all three have very deep keystones. The whole structure is "rusticated" with strong channelling, and "vermiculated," to use two absurd classicisms; the latter, which gives the surface in its present state an appearance of being pitted with holes, is objectionable and meaningless, one of the tricks of the Renaissance. A pediment rises above the centre with Buckingham's arms and coronet; the supporters are outside this, lions holding shields; at the back the Gate appears lower, because approached from higher ground; the keystones of the arches are here smaller and carved with arms and the anchor indicating the Duke of Buckingham's office as Lord High Admiral. Above runs the motto *Fidei coticula crux* (the Cross is the touchstone of faith); over it are four stone balls. Some remains of the second Duke's residence—in which Peter the Great lived for a time—may be seen in the house nearest the Gate, now occupied by the Charity Organisation Society, where there is a stately panelled room on the first floor; the ceiling is finely moulded with roses and apples.

In its present condition the Gate has a forlorn appearance, but it would have been worse but for the London County Council, who purchased it for the public. Not only has the river-bank been moved away, but the level of the ground has risen so that the structure stands ungracefully in a sort of "area." In the first place it should be raised. Then it would be advisable to re-erect it, over some landing place if possible, by the new bank of the Thames, thus restoring it to its original purpose. Even if this were not done, it is absurd to leave it in its present hiding-place. A certain amount of cleaning and repair moreover is absolutely necessary.

ENTRANCE GATES, CARSHALTON PARK.

THESE gates were designed about 1723 by Giacomo Leoni, a Venetian architect, for Thomas Scawen, who inherited the estate from his uncle, Sir William Scawen, a noted London merchant. Leoni also designed the house, but through lack of funds it was never built and only the gates remain to remind us of a man who started to build and did not count the cost. The gates, including the railings, have a frontage of about 100ft., terminating at each end with Portland stone piers 17ft. 6in. high, richly carved, and surmounted by fine lead figures of Actæon and Artemis 7ft. 6in. high. The stone is in a good state of preservation, the panels on the inside being remarkably sharp. These panels have been for some years encased with wood to prevent them being damaged by cattle, and by the vulgar crowd who delight to carve their insignificant names on anything that is old and beautiful. The wrought-iron scroll-work to pediments is very fine, and has been kept in a fair state of preservation. The central pediment is surmounted by the crest of the Scawen family—a hand bearing an uprooted tree. We understand that these gates have been sold for £6,500, and will shortly form the entrance to an American millionaire's park.



ENTRANCE GATES, CARSHALTON PARK, SURREY.

GENERAL VIEW OF ACKWORTH SCHOOL, NEAR PONTEFRACT.

ELECTRIC LIGHTING OF LARGE COUNTRY HOUSES.

PRACTICAL HINTS.

TO any who are thinking of installing electric light in large private houses the following practical hints, dealing with matters that are sometimes overlooked, will doubtless be of use:

(1) In the case of steam-driven plants, arrange for ample boiler capacity. Easy firing is a great factor in saving fuel and prolonging the life of the boiler.

(2) Let the steam engine be so proportioned and its valves so adjusted to the work that when the boiler is at its normal pressure (this is settled by adjusting the safety valve) the engine can only give such power as will drive the dynamo to its full capacity. Overloading the dynamo is then impossible. The same remark applies to both turbines, oil engines and gas engines. With oil and gas engines it must always be remembered that they are most economical when working at their full load.

(3) The battery must be so proportioned to the motive power and to the dynamo that it can be charged at its normal rate only when the generating plant is working at about its maximum power. Overcharging will then be impossible.

(4) In order to avoid unreasonable expense in cable, note that when the power is at a great distance from the house—say one mile or more—it is better to use a very high tension current and drive a motor which would in turn drive a dynamo at the house where the battery would be placed; or, if the power is more than 300yd. to 400yd. distant but less than 1,200yd. to 1,500yd., place the battery at the house and the dynamo where the power is obtained; and when the power is within 300yd. or 400yd. of the house, place the battery in the building where the power is generated.

(5) Do not over-light corridors. This is especially important because as a rule corridor lamps are in use during all the dark hours, and a few of these might easily burn a very large proportion of what was required for the whole house. Whenever possible place the lights where two passages meet so that they can give light to both.

(6) In lighting the living rooms do not group lights together in clusters or fix them close to the ceilings or walls, but place them singly, equi-distant from the walls and from each other, and at a height of from 8ft. to 10ft. from the floor; in halls the height might be up to 15ft. It may be assumed that an ordinary 16 c.p. electric lamp at a height of 10ft. will light 100 sq. ft. of floor surface sufficiently for all ordinary purposes. Where a concentrated light is required for reading or writing, provide a portable hand-lamp connected by means of flexible cord from a wall plug. Such a lamp should have adjustable shades so that the light may be thrown direct on the book whilst it is screened from the eyes.

(7) It may sometimes happen that where the gas fittings in a house have been designed to suit the style of the room in which they are placed, they may be employed as electroliers, but as a rule it is better not to make use of the gas fittings. There is no very great saving, and the effect of a room may easily be spoiled.

(8) In bedrooms much depends on their size, but it is well to remember that dressing-table lights should be directly over the looking glass, and that in almost all cases a second switch from the bed is a luxury that is much appreciated.

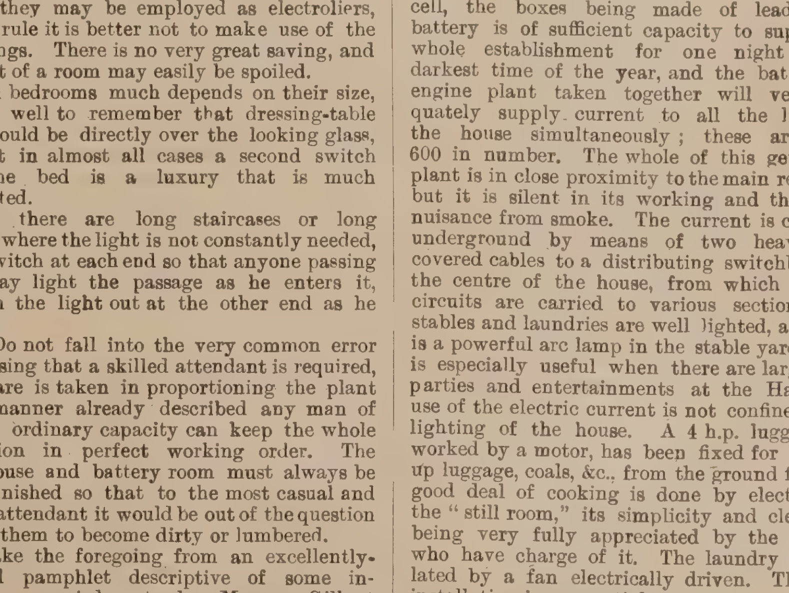
(9) If there are long staircases or long passages where the light is not constantly needed, have a switch at each end so that anyone passing along may light the passage as he enters it, and turn the light out at the other end as he leaves it.

(10) Do not fall into the very common error of supposing that a skilled attendant is required, for if care is taken in proportioning the plant in the manner already described any man of the most ordinary capacity can keep the whole installation in perfect working order. The power house and battery room must always be neatly finished so that to the most casual and careless attendant it would be out of the question to allow them to become dirty or lumbered.

We take the foregoing from an excellently-produced pamphlet descriptive of some installations carried out by Messrs. Gilbert Gilkes & Co., Ltd., Canal Iron Works, Kendal, to whom we are indebted for the accompanying illustrations.

Underley Hall, the residence of Lord and Lady Henry Cavendish Bentinck, is a large and beautifully-situated country house near Kirkby Lonsdale, in the county of Westmorland. It is near the River Lune; but although a good water-power might be obtained from this river during the greater part of the year, there are short periods of drought and flood which, it was deemed, made it unwise to make use of the water-power. The house had been lighted by gas, from its own gas plant, but this had become old-fashioned, and Messrs. Gilbert Gilkes & Co. considered it better to use steam rather than gas as a motive power for the electric light. Two engines, capable of developing 20 h.p. to 25 h.p. each, and suitable boilers, were installed, each engine driving a dynamo having a normal output of 100 ampères at 105 to 140 volts. The switchboard is so arranged that the engines with their dynamos may work together in parallel or separately as occasion requires. A large battery of accumulators, having a capacity of about 1,200 ampère-hours, is placed in a well-lighted and ventilated room on the first floor of the engine-house. There are fifty-four cells, forty-five plates in each cell, the boxes being made of lead. This battery is of sufficient capacity to supply the whole establishment for one night in the darkest time of the year, and the battery and engine plant taken together will very adequately supply current to all the lights in the house simultaneously; these are about 600 in number. The whole of this generating plant is in close proximity to the main residence, but it is silent in its working and there is no nuisance from smoke. The current is conveyed underground by means of two heavy lead-covered cables to a distributing switchboard in the centre of the house, from which separate circuits are carried to various sections. The stables and laundries are well lighted, and there is a powerful arc lamp in the stable yard, which is especially useful when there are large house parties and entertainments at the Hall. The use of the electric current is not confined to the lighting of the house. A 4 h.p. luggage lift, worked by a motor, has been fixed for bringing up luggage, coals, &c., from the ground floor. A good deal of cooking is done by electricity in the "still room," its simplicity and cleanliness being very fully appreciated by the servants who have charge of it. The laundry is ventilated by a fan electrically driven. The whole installation is very satisfactory.

Messrs. Gilbert Gilkes & Co. have also installed the electric light at Ackworth School, near Pontefract, belonging to the Society of Friends. About 300 boys and girls are boarded at this school, and there is a large staff of resident masters and mistresses. Such a community



THE BATTERY-ROOM UNDERLEY HALL, WESTMORLAND.

THE ENGINE-ROOM, UNDERLEY HALL, WESTMORLAND.

necessarily requires extensive premises, and of late years the governing body have been improving the property in many ways, adding a lecture hall, a large suite of masters' and mistresses' rooms and a swimming bath. Approximately, 700 lights are required for lighting, the whole system being worked at 100 volts. There are fifty-six accumulator cells, the battery having a capacity of 720 ampère-hours. The suite of teachers' rooms and the large lecture hall immediately above them are ventilated and warmed by means of air driven through a steam radiator by an electric fan.

Newbiggin Hall, where Messrs. Gilbert Gilkes & Co., also installed the electric light, is one of the oldest houses in Westmorland, and has for generations been the property of the Crackanthorpe family. Many years ago a small mill must have stood about half a mile from the house, where traces were found of the old head-race which brought the water from an adjoining stream to a point at which a fall of about 16ft. could be obtained; but, with the exception of the evidence of the earth-work in this head-race, all trace of the old mill had gone. A weir has been constructed, the head-race reinstated, and a little stone building has been built for a turbine and dynamo, from which the current is carried underground to a building close to the mansion where the energy is stored in a battery of accumulators. In such a house as this some might have hesitated to introduce modern innovations; but Mr. Crackanthorpe has taken so much pains to render the lighting unobtrusive that all the comfort of a good light is obtained without in any way taking from the mediæval effect of this fine old Hall.

NEW DRILL HALL AT HUDDERSFIELD.

GENERAL BULLER opened the new Drill Hall at Huddersfield last week. The building, which has been erected at a cost of about £8,000, has a frontage of about 80ft. to St. Paul's Street, and covers an area of 208ft. by 82ft. It is in three sections, divided by solid walls. In the centre is the main hall 108ft. by 75ft., with a height to the ceiling of 40ft. At each end are balconies stretched across the whole width of the hall. These are 7ft. wide, but as they project at first-floor level, and are not supported by pillars, they do not interfere with the ground floor space available for drilling purposes. The floor area is nearly three times that of the old armoury. On the first floor the principal room, which is 50ft. by 24ft., is utilised as a clothing store, while accommodation is also provided for meetings, examinations, &c., an ambulance store and a room for the use of the signallers. At the east end of the drill hall is a two-storey building, which will practically be devoted to the rank and file. There is a storage room and a well-arranged kitchen in the basement.

ARCHITECTURAL ASSOCIATION.

THE PROTECTION OF BUILDINGS FROM LIGHTNING.

A SPECIAL GENERAL MEETING of the Architectural Association was held on Friday evening last (Mr. W. H. Seth-Smith, president, in the chair) to consider various alterations of the by-laws. A new by-law was approved for the appointment of four trustees in whose names the funds of the Association will be invested; the first are Messrs. G. H. Fellowes Prynne, Arnold Mitchell, G. B. Carvill, and W. H. Seth-Smith. By-law 26 was altered to read, after "treasurer," "*or secretary*"; and by-law 27, after the words "shall be paid by the treasurer," "*or secretary.*" The alteration of by-law 33 was also sanctioned, and now reads: "*The office of president, vice-president or librarian shall not be held by any member for more than two consecutive sessions. The offices of treasurer and hon. secretaries shall not be held by any member for more than five sessions and four sessions respectively.*"

The ordinary general meeting followed, and the following gentlemen were elected members: Messrs. Ernest George, J. M. Brydon, Ralph Berrill, A. E. Chasemore, A. D. Jenkins, J. H. Cooper and James H. Shearer. Mr. Alfred Hands then read his paper on "The Protection of Buildings from Lightning." The following is a summary of it:—

The popular idea of lightning comprises little more than that it is something stored up in a thundercloud which is apt to leave it and travel to the earth, doing damage to objects which obstruct its course; that it is attracted to and conducted by metals; and that when it reaches the earth it disperses or becomes lost, more especially if it gets to water. These ideas give a very incorrect view as to what the problem involved in protection from lightning really is. As a consequence, it is popularly supposed to be a very easy one. All that is thought to be necessary is to have a lightning-conductor raised sufficiently high to attract the lightning; it must be of large size to allow an easy path for the discharge, and its lower end must be taken into moist ground or into water, and there the matter ends. This view also contains an element of truth, but it is very far from being the solution of the problem. Instead of being a simple matter, protection from lightning is a most complex subject.

I cannot, within the narrow limits of a paper, place before you the whole subject, but I hope to be able to show something of the principles which are involved, and more especially as to the common-sense view; for, although it is very often ignored, there is such an aspect. I think that little could be said in favour of lightning conductors if they would not bear the searching light of common sense. It is not a subject which can be taken up lightly and disposed of in a few words, and a thorough knowledge can only be obtained by very close study, exhaustive experiments, a careful investigation of the phenomena exhibited by nature when objects are damaged by lightning, and a very extensive experience of the questions to be considered in the protection of buildings.

It is impossible to arrive at the amount of damage to property due to lightning, which occurs yearly in this country, but I believe I am below rather than above the actual figures in saying that it must be between £50,000 and £100,000. I have for many years been collecting particulars of damage of this nature, from which I am at present preparing a map of England showing the positions and nature of the objects struck. This work takes considerable time if one desires to be accurate, and I have at present only completed from the beginning of 1898 to the present time. Most of our large towns, and particularly the manufacturing ones, are indicated by the number of cases of damage; I think this ought to dispose of the mistaken idea sometimes expressed that the smoke in towns acts as a protection.

In order to understand the principles involved in the science of protection, it is necessary to clearly understand the electrical action in a storm of this kind. You are aware, of course, that lightning is merely electricity differing in no respect from that generated by a frictional or influence electrical machine, except that it is on a gigantic scale. You are also doubtless aware that this form of electricity called static is of a dual nature, generally called positive and negative; that it is impossible to produce one without the other, and that by a process called induction, where the one state is existent the other will be near it, being only prevented from joining by whatever insulating material is interposed. The existence of one electrical state is proof of the existence of the other, and that it is as near as the insulating material will allow it to get. This is precisely what occurs in a thunderstorm. The storm clouds provide the charge of one nature, and the earth with the buildings and other objects on it has by induction the other—the air between is the insulator which tends to prevent their joining. Of course, it frequently happens that different clouds in one storm are oppositely electrified, and hence we get flashes from one cloud to another, but as these discharges do not affect our safety, we may leave them out of account. Presuming that the cloud is positive, the earth and the objects on it are necessarily negative, and therefore there is a state of tension between the two which becomes more acute as the respective charges increase, until at last the tension becomes too great, the insulating material gives way, and momentarily the path of the strain becomes visible by a line of matter rendered incandescent, and this we call lightning. The strain has existed before the flash appears, and the path it follows is all prearranged. One cannot say that anything has left the cloud to come to earth, any more than that something has left the earth to travel skywards. It is merely the re-uniting of the two states, or rather the restoring of the equilibrium which had before been disturbed. Wherever a difference of potential exists there is a strain due to the necessity of restoring the equilibrium or level, and if the strain is great enough to break down the insulating material, a spark will pass. Therefore, if we could do away with the strain, or reduce it in time, we should prevent the breakdown, or in other words prevent the discharge taking place, and this is what we endeavour to do when we provide a lightning-conductor with points. They possess this power; they may almost be considered as safety-valves. While the potential in the clouds is being raised in the process of the formation of the storm, every point is reducing the strain by what is called brush or silent discharge. Theoretically, a lightning-conductor should never be struck by lightning; practically, it may be because the potential may be raised so rapidly that the points cannot reduce the strain quickly enough. Points, however, possess a very considerable protective effect and form a most important function of a lightning-conductor, although not absolute. The conductor might even be so far inefficient that it would not convey a lightning discharge harmlessly and yet the points would still exert their protective effect in this way. During a thunderstorm the points of a conductor may frequently be seen to glow with the light of the brush discharge, and this may even be concentrated into short sparks or a spitting effect, as Professor Lodge graphically put it. Then we hear people say they have seen the lightning playing about the lightning-conductors. When this occurs the tension must be enormous, and it is just a question whether the lightning flash will occur or not.

If the points are not able to prevent discharge, the second function of the lightning-conductor, its power of conduction, should prevent any harm occurring to the building on which it is fixed if it has been applied on scientific principles, but it is just in this that the complicated and difficult nature of the matter consists.

When, in 1752, Benjamin Franklin established the identity of electricity and lightning, he immediately suggested the possibility of preventing the damage which this force caused to buildings. Buildings in Franklin's day were easy to protect; those of to-day are very different. The next important epoch was when William Snow Harris became interested in the subject, more especially as regards the protection of ships from damage by lightning, the losses sustained from this cause both by the Royal Navy and the mercantile marine being at that time very considerable. Snow Harris succeeded in getting his system of protection adopted by the Admiralty, and became the premier authority of his day on this subject, ultimately receiving the honour of knighthood for the services he had rendered. Many of our important public buildings were protected in accordance with the plans and specifications of this distinguished scientist, and no case of failure occurred to show that he had blundered. I have had the opportunity of examining some of the buildings fitted in accordance with the plans of Sir William Snow Harris, and have been particularly struck with the thoroughness with which they had evidently been studied. Snow Harris advocated copper as being the best conducting and most durable metal, and therefore the most suitable for lightning conductors. His system, which generally comprised a number of conductors on one building, was to connect all the metals about the structure to one another and to the conductor system so as to bring the whole mass into a state of uninterrupted conduction. A most interesting controversy took place between Mr. C. V. Walker, F.R.S., who was at one time President of the Meteorological Society, and Sir William Snow Harris on the question of side-flash or lateral discharge. Walker contended that sparks might pass between a lightning conductor and other metals about the building adjacent to it. Snow Harris made a distinction between metals which were earth-connected, and would therefore form alternative paths for the discharge, and insulated metals which would not assist its passage to earth. He argued that while there would be a division of the discharge between the conductor and the alternative path, sparking to the insulated metals was impossible. One wonders, in reading his works, whether he really believed that sparks would only occur to metals leading to earth. The elaborate precautions that were taken to connect his conductors with all the metals about the building, whether going to earth or not, do not bear out this contention, or where would have been the necessity for such connections? The only construction I can put upon the matter is that he meant that with his system of protection side flash was impossible. I acknowledge that this argument savours of special pleading for Snow Harris, for his writing seem to indicate that his words are to be taken literally. He says, "Can the bodies *a*, *b*, *c* elicit from the conductor, at the instant of its transmitting a heavy discharge of lightning, a destructive lateral explosion upon the parts of the building on which they happen to be placed?" This is the legitimate and fair definition of lateral discharge as applicable to a lightning rod. I have no hesitation in saying that if that conductor was struck by a heavy discharge of lightning, as he calls it, sparks would pass, though they would be merely sparks between the conductor and those metals, not "explosions" in the bricks to which they are fixed, and there would probably be no traces afterwards of their passage; but if we altered the conditions slightly by placing the conductor about 3in. from the corner of a building, and the metals 3in. round the corner, the bricks between would be slightly damaged.

The next event to which I have to draw your attention is the formation of the Lightning Rod Conference. In 1878 the Royal Meteorological Society decided that it was expedient that a conference should be held to consider the best means of protection from lightning, and issued invitations to certain other learned societies to appoint delegates. Their labours extended to December, 1881, when their report was issued. During that time they had exhaustively examined all the evidence they could collect as regards damage by lightning, the methods adopted by manufacturers, and the writings of British and foreign authors. The report of the Lightning Rod Conference, as it is called, was published by Spons in 1882, and became the standard work of reference on the subject in the English language. Personally, I consider the rules they drew up, although not faultless, are admirable in the way in which I believe they were intended—that is, as a guide to architects and others interested in buildings, which should enable them to learn something of the methods employed in the protection of such structures, and give them some such knowledge as should enable them to see that the work was being carried out on scientific principles; to do away with prejudices often entertained against the use of conductors; but most of all to try and dispel the extraordinary ignorance displayed at that time by some of those engaged in the erection of conductors. I cannot believe that the report was ever intended to serve as a complete guide capable of rendering any one who read it an expert fully qualified to plan the lightning conductor system necessary for the protection of a building. If it was, it was a dismal failure, and I do not believe that it is within the power of any man, or of any body of men, no matter what their scientific attainments, to formulate a set of rules which shall serve such a purpose. Nothing is said in the report about sparking, or side flash, from the conductor in actual words, but they drew attention to the necessity of connecting all masses of metal about the building with the conductor. As in our criticism of Snow Harris, we can say, if sparking, or side flash, was not admitted, where would be the object of advising these connections? This rule commences: "As far as practical, it is desirable that the conductor be connected to extensive masses of metal, such as hot water pipes, &c., both internally and externally." I consider the wording of this rule most unfortunate, because practicability has nothing to do with the matter. The connections are either necessary or they are not. If they are necessary, practicability must not be taken into account; means must be taken to connect them even if it is inconvenient. This rule has led to the assumption that these connections are not of vital importance, and therefore they are not generally made. With internal metals, for instance, it is rarely considered practical to connect them, because people naturally object to have their walls cut about in order to have a connection carried through. The explanation of the anomaly is, to my mind, to be found in the words which follow: "But it should be kept away from all soft metal pipes, and from internal gas pipes of every kind." Obviously, if connecting to internal metals is not practical, the alternative is to keep the conductor sufficiently far away, but the point is generally missed. Probably the vagueness of the first part has led architects and others to think that the whole rule is unimportant, for in the course of a rather wide experience I have never yet met an architect who took into consideration the positions of inside gas or water pipes or other metals when deciding where he would have his conductors fixed.

The conference clearly stated that lightning conductors may be of iron or copper, but advocated the latter metal as being more convenient and durable, and in the end the cheapest. They stated that the minimum size to be used should be a weight of 6oz. to the foot run, which in copper tape, the form now mostly used, would be ¾in. wide by ⅛in. thick.

The last epoch that we have to consider brings us to more recent times. In 1888, Dr. Oliver Lodge, F.R.S., was invited by the Society of Arts to deliver two lectures on "Lightning Conductors" in memory of the late Dr. Mann, at one time a President of the Royal Meteorological Society, and who, during his lifetime, had taken a keen interest in the subject of protection from lightning. Professor Lodge is one of our most brilliant scientists, but I do not know that he had paid particular attention to this subject previous to this invitation. Professor Lodge delivered these lectures, and I am speaking mildly in saying that they created a sensation. In the course of these he carried out experiments intended to show that a very thin iron conductor was better for the purpose of a lightning conductor than a thick copper one. Incidentally he showed that small-size iron wire was better than stout iron, and that small size copper was better than stout copper. Here we have what appears to be a paradox—the worse the conductor the better it is. It is

THE DINING-ROOM, UNDERLEY HALL, WESTMORLAND.

necessary to say that Professor Lodge states that "the values given are a record of a definite experiment, but their precise value depends on the circumstance of the experiment. It is easy to arrange so that the iron is less effective than the copper." Nevertheless, he remarked that he looked upon copper conductors as doomed. Professor Lodge then read a paper before the Institute of Electrical Engineers, in 1889, at which most of the leaders of the electrical world were present. In this paper Dr. Lodge discussed at great length the question of side flash, or sparking, from a conductor, but he did not draw a line, as Snow Harris had done, between sparking to insulated metals and the dividing of a discharge between a conductor and an alternative path. On the contrary, he appeared rather to treat all side flashes as being portions of the discharge, leaving the conductor to go to earth by other and sometimes worse routes, with the exception of secondary effects or the sparkings caused by induction in metals not connected with the conductor. He contended that the older electricians, as he termed what may be called the votaries of experience, had not taken certain laws and effects into consideration. One of the main points in his arguments was that a lightning flash is not a single discharge, but is oscillatory; that is to say, that it consists of a number of discharges backwards and forwards till it comes to rest, a dozen or more alternations probably occurring in a flash occupying a minute fraction of a second, and that under these circumstances the generally accepted ideas as to the comparative conducting value of copper and iron are changed. Therefore, he now contended, iron of the same thickness as copper was "a trifle better, certainly not a whit worse than the latter metal." In the discussion which followed, which extended over three meetings, Dr. Lodge was opposed by the majority of the speakers. They did not, however, protest against the possibility of side flash, but the ground mainly taken up was that lightning was not oscillatory, and they contended that the older views as to conductivity were sound. The question is, I consider, an unimportant one, because if harm was not caused by the first or second swing, the remainder would be harmless.

Dr. Lodge illustrated his lectures and paper by some most interesting experiments, which, however, I consider were not conclusive, because the conditions were not such as occur in Nature. To this day I often hear it said that Dr. Lodge says lightning conductors are useless, and therefore I may quote his disclaimer. In his book on "Lightning Conductors," published by Whittaker's, he said: "I may be permitted here to repudiate the doctrine which has several times been attributed to me since the Bath meeting—that it is safest to be without lightning conductors altogether. The long experience of persons learned in this art is by no means to be despised, and until an agreement as to improvements has been arrived at, the safest plan for ordinary persons is to adhere to existing practice."

Dr. Lodge's work forms, in my opinion, an important addition to the literature of the subject, if taken as purely of theoretical value, and on which we must base our own ideas of the practical results which are to follow. He has called attention to the necessity for taking certain effects more fully into consideration when arranging our system of defence, and has shown us some of the scientific reasons for their appearance, and for this we owe him a debt of gratitude such as we owe to every man who labours to give us a clearer insight into the mysteries of Nature.

The effect so far of his work, however, appears to me to have been to cause a great deal of confusion in the minds of some people, and I must protest against the exaggerated views that are often expressed in relation to these effects. For instance, Dr. Lodge has referred to side flash and to the surging effect of a discharge, and other writers have referred to these effects as if they were some new invention of the devil tacked on to lightning to render it still more deadly than of old. These effects have existed since the days when lightning conductors were first invented, and even before then to the earliest times in which metals used in the construction of buildings hace acted as accidental or partial conductors of the electricity from thunderstorms.

Dr. Lodge has made suggestions as to improvements which he considered might be made in the applications of lightning conductors. He prefaced these by saying, "It is a matter on which I have not the slightest wish to be dogmatic; and if I make a few apparently definite assertions, it is only by way of expressing such judgment as I have been able to form at present, and they are to be taken as intended more by way of suggestion and question than anything else." Leaving out of account those rules which apply only to powder magazines and lightning arresters, and three which refer to testing and which are not of practical value, there are only ten which differ materially from previous scientific knowledge of the subject. I will give these ten rules, together with a few remarks, though my later observations will deal more fully with the matter :—

(1) The use of copper for lightning conductors is a needless extravagance.

(2) Iron has advantages over every other metal.

My later remarks will deal with the question of copper *v.* iron.

(3) It is hopeless to pretend to make the lightning conductor so much the easiest path that all the others are protected. All possible paths will share the discharge between them, and a lot of apparently impossible ones.

This rule does not differ, except as regards the "apparently impossible ones," from the dividing of a discharge among alternative paths Snow Harris explained about fifty years before. My later remarks may explain this more fully.

(4) At all places where water and gas-pipes come near each other, and in general where one metal ramification approaches another, it is best to connect them metallically.

This rule Dr. Lodge has since admitted is very open to criticism, but I consider that it would be an admirable one if it was only qualified by being made to read that in some cases it may be absolutely necessary to make such connections.

(5) It is not wise to erect very tall pointed rods above the roof of a building.

(6) In ordinary houses it may be well to try and insulate the lightning conductor from the walls, so as to lessen the chance of side flash to metal stoves and things inside.

(7) In chimneys it may be well to use insulators to protect the bricks from concussion.

These three rules Dr. Lodge has since described as very doubtful.

(8) The orthodox rule "Connect all pieces of metal to the lightning conductor" requires modification thus, "Connect all pieces of metal to each other and to the earth, but not to the lightning conductor."

(9) It may be always reckoned safe to earth things independently. It is often not safe to connect them to the lightning conductor; *e.g.*, an inside lining of a chimney should be well earthed, but should not be used as lightning conductor, nor connected with it. The same with rain-water pipes and gutters. The same also probably with lead roofs.

After each of these two rules Dr. Lodge places a note of interrogation to show, I presume, that he was doubtful about them, and he has since admitted the force of the criticism to which they were subjected, and says he gladly takes refuge in another rule which contains the truism that the most difficult thing is to know what to connect and what to avoid. These two rules would be of vital importance, and would revolutionise present practice if they could be justified, but I hope to show you that they would be dangerous in the extreme, and far, from tending to increased efficiency of conductors, would cause failure. They have, however, been quoted by others as if they were correct, and without Dr. Lodge's subsequent remarks, or even the notes of interrogation after them.

(10) Over the top of tall chimneys it is well to take a loop or arch of the lightning conductor made of any stout and durable metal. Dr. Lodge has since modified this rule, but I need only say that the coronal band with points at intervals, recommended by the Lightning Rod Conference, answers the purpose perfectly.

Although Dr. Lodge's views did not, I think, obtain the consideration they deserved, we may still consider that there are in existence the two schools, the one of theory pure and simple, as represented by Dr. Lodge, and the school of experience, as represented by the teachings of the older electricians, as Dr. Lodge called them. Between these two we must discriminate and formulate the method of procedure which will ensure success. Theory and experience are each in their way of the greatest value, but one is useless without the other. For the sake of distinction, however, we will keep to the terms "theory and experience" in considering the points in dispute. Experience says, let your conductors be of copper, which is of better conducting capacity than iron or any other metal which it would be practical to use for the purpose; and besides, it is the most durable, and in the end the cheapest. The comparative conductivity of copper and iron they base on tests made by many distinguished scientists, both British and foreign, who have shown that in the case of steady currents of electricity copper conducts about seven times as well as iron. Theory says that for sudden discharges such as lightning the conditions are changed, and that iron is "a trifle better, certainly not a whit worse than copper," and that the use of the latter metal is a needless extravagance. Also that instead of having single conductors of copper, a number of lines of conduction of iron wire of small size is better (ordinary telegraph wire is suggested) that these wires should be carried down each corner of every chimney stack on all sides of the building. On purely theoretical grounds I see little to choose between the two systems, provided the conductors are applied on scientific principles. A man who understood the subject thoroughly would be able to protect a building as perfectly with one system as with the other, but the many iron wires would be more difficult to apply successfully, because it is easier to place one or two conductors so as not to be within sparking distance of metals to which it is not advisable to connect them than to fix a dozen so. I have only had an opportunity of examining one system of the theory-sort erected in this country. So far as I know it has never been subjected to the test of lightning, but it is, nevertheless, an instructive case. A chimney shaft was about to be built at the time of Dr. Lodge's lectures, and the engineer in charge, who was an electrician, had followed Dr. Lodge's arguments very closely, and decided to try the small iron-wire system. He therefore had eight galvanised iron wires fixed vertically, one at each angle of the octagon and running round the shafts at intervals. Not having, however, implicit confidence in this type, he also had an ordinary conductor of copper tape fixed to the same shaft. The cost of the iron arrangement was about £35 to £38, that of the copper one £22. When I examined the two systems after a lapse of about eight years I found the iron wires at the top of the shaft completely eaten away. The copper conductor was practically as good as when it was erected. This would, I think, be a fair sample of the theory type of conductor—durability sacrificed and original cost increased tremendously. For it is a very great mistake for Dr. Lodge to suppose that his suggested iron telegraph wire system would be cheaper than the copper tape generally used. Iron is, of course, cheaper than copper, but the cost of fixing is a serious item, and where say several hundred feet of iron wire has to be fixed in place of a hundred feet of copper tape, the total cost must be greatly increased if the work is to be done by competent men under the guidance of an expert.

Personally I do not attach very great importance to the kind of metal to be used for a lightning conductor. The conductor may be of copper or iron, or it might even be of lead; so long as it is of sufficient capacity not to be melted by the heating effect of a severe discharge it will answer if properly applied. On the score of durability and cheapness, I have no hesitation in saying that the older type, or copper tape conductor, cannot be beaten. On the score of appearance, too, copper tape has the advantage, and appearance has to be considered, for I do not think there are many architects who would consent to have their work turned into what would look like enormous birdcages.

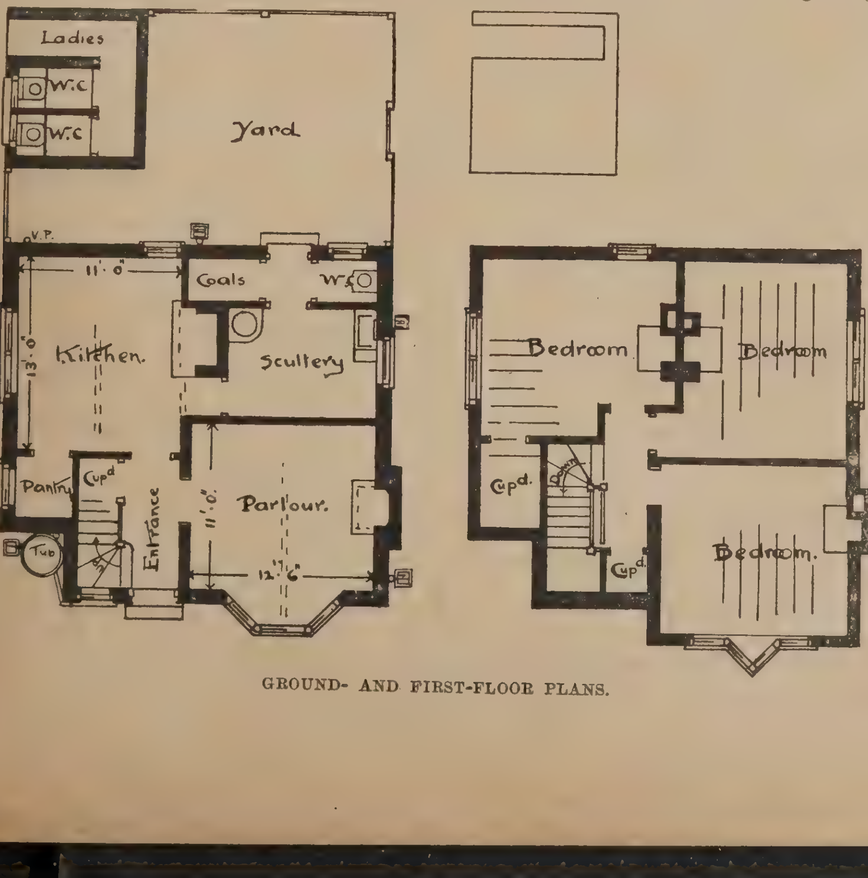
As Dr. Lodge has himself said, it is impossible to make the lightning-conductor such a superlatively easy path that the discharge will take that one only if other paths are open for it, but it is here that the skill and scientific knowledge of the expert has to be shown. If one had to protect a structure composed only of brick, stone or wood, and with not a particle of metal in its construction, nothing would be easier. All that would be necessary would be to have a conductor of metal, pointed at the top and leading down into the earth. It might be made in lengths scarcely touching one another, and the earth connection might be absolutely bad, and yet the building would be protected. All that would happen would be heating and possible fusion at the joints, and the ground at the foot of the conductor might be blown up. It is very rarely, however, that one is called upon to protect a structure of that kind. Modern buildings are often a mass of what I may call unintentional lightning-conductors, for all the metals used in the construction of buildings are conductors of electricity, and therefore conductors of lightning. Some of these metals have good earth connections—in fact, gas and water supply-pipes have excellent "earths," owing to the extent of their ramifications underground; and it is a matter of considerable difficulty—in fact, in some cases practically impossible—to make the "earth" of the intended conductor as good as these accidental ones unless we actually connect the conductor to the underground mains. This is the common-sense view of the matter. If you fixed one conductor to the highest part of a building, and another one, say, 6ft. up the wall, and approaching within a foot or two of it at that point, and both with equally good earth connections, I do not suppose you would be surprised if the lightning divided and part went down one conductor and part down the other, or, if brickwork intervening, a hole was made through it. Why, therefore, should you be surprised if, when arranging for your lightning conductor, you take no heed of the metal inside the building, and place one conductor down outside, and another one in the form of a gas-pipe inside, and the discharge divides between the two, knocks a hole in the wall, and sets light to the gas? Lightning has to follow certain unalterable laws, and one of those laws is that if two or more paths are provided, it must divide between them. Out of the many cases of true failure of lightning conductors that I have examined I have found that 90 per cent. have been due to neglect of this common-sense view, as I call it. We should arrange so that the division shall not take place. We cannot prevent a building being attacked by lightning—any structure, from a cathedral to a hencoop, may be struck. All we can do in this respect is to provide our conductor with points (and the more the better) to lessen the liability of its being struck. We can, however, go further than this. We can, by carefully studying our building, both inside and out, arrange our conductor system so that the lightning shall go harmlessly past it through our conductor and leave our building and its contents secure. A distinction should be drawn, as Snow Harris did, between side flash to other paths and sparking to metals which do not afford an alternative path, though not agreeing with him as to the impossibility of the latter.

LODGE, WEST PARK, HULL. JOSEPH H. HIRST, Architect.

When the conditions are proceeding which lead to a discharge of lightning occurring, induction, as I have already pointed out, takes place; that is to say, there is an enormous difference of potential between the cloud and the building about to be struck; this inductive action is stronger in conducting than in non-conducting masses, therefore the lightning conductor and other metals would show this action better than brickwork. If the metal is connected to earth the action would be quick; if the metal is insulated the action would be slower, because the charge would have to filter through the insulating material gradually. Local sparking is not as a rule a very serious matter. A small hole may be made through brickwork or other intervening non-conducting matter, but that is about all, unless some inflammable material intervened, when a fire might be caused.

Now we come to the question of division of a discharge between a lightning conductor and other paths to earth, which form what I call accidental conductors. Given a lightning conductor outside and a gas or water-supply pipe near to it inside the building, and this is a very different matter. The action as regards difference of potential and consequent strain and resulting spark is somewhat similar; but the sparking distance is very much longer, and the spark more powerful, because it is actually a portion of the lightning discharge passing. If we knew the respective inductive resistances of the intended and accidental conductors, we could gauge approximately what proportion of the discharge would go to earth by the former and how much by the latter. But even if you got nineteen-twentieths of the discharge through the former and one-twentieth through the latter, it might be a serious matter. I may here refer again to Dr. Lodge's suggestion that metals should be connected to earth and not to the conductor.

As to the methods for rendering our system of protection perfect. We must first of all decide on which are the parts of the building liable to be struck by lightning, and protect them either by separate conductors or by branch conductors carried to one or more mains to earth as may be necessary, and we must see that these conductors afford as little resistance as possible. The joints must be soldered so that they will not only be perfect at the time they are put up, but will remain perfect. The earth connection must also be made so that this path is at least as good a one as other paths about the building; and besides this we must carefully study our building, both inside and out. We must take into consideration all the metals used in its construction, both as regards their relation to the conductor system and to one another, and take such precautions that neither division of the discharge shall occur unless we intend it to occur, nor sparking in places where sparking would do harm. It is here that the skill and experience of the expert have to be displayed, and I cannot give you any rules for your guidance on this matter, for buildings differ so much in their construction and arrangement that rules applicable to one case would be absolutely useless for another. Nothing is of use but knowledge and experience, and, as I have already indicated, these cannot be imparted or acquired in a short space of time. I can only say that in some cases connections are made and in others the dangerous metals are avoided, but that great discrimination is required as to what metals are connected and what avoided. Sometimes dividing the discharge between several paths or over a wide extent is the best plan, and sometimes other plans are adopted according to the exigencies of the case or the particular combination of dangers which one may find to exist.



GROUND- AND FIRST-FLOOR PLANS.

I may, in conclusion, discuss a matter which is of great importance to architects, and that is as to what parts of a building are liable to be struck, and which therefore require protection. I have devoted many years to this question, and have examined many thousands of buildings which have been struck, first, with the object of formulating a theory, and afterwards to prove that theory; and I propose putting this before you as briefly as possible. The main principles are simple, and possibly it is the very simplicity of the matter which has led to its being overlooked. The popular idea is that it is the highest point of a building which is struck, but probably some of you may have met with cases in which others very much lower down have been damaged. I have come across hundreds such. The explanation is that the nearest part of the building to what I may call the point in the cloud from which the discharge originates gets struck, and the highest is not necessarily the nearest. A discharge occurs between two planes or points, one of which is in the clouds and the other is in the ground; the building is merely an object *en route*, as one might say, which forms a path of less resistance than the surrounding air. Now, a lightning-conductor does not attract lightning except inasmuch as, being of metal, induction and consequent difference of potential takes place more strongly in it than in the surrounding non-conducting materials, and in this respect the thin line which is intended to protect the building from lightning is insignificant compared to the other metals used in its construction.

Brickwork, although non-conducting to a certain extent, offers a lower resistance than air. Therefore it would be contrary to science for a discharge to pass over a chimney-stack or gable-end to strike a lightning conductor merely because it is metal, when probably the gable-end or chimney has a much larger extent of metal just below it. Even if the lightning-conductor affords the best path to earth, the path of least resistance would be through the gable-end or chimney and the house to the conductor, rather than through a corresponding distance of air, to get to the top of the conductor. We have to consider two kinds of discharge, one the most dangerous type, which occurs fairly straight through the air in an almost vertical line, and the less dangerous flashes which occur in a somewhat oblique line, and are generally meandering in their course. These latter flashes are often called forked lightning, though this is a misnomer, and are popularly, but mistakenly, supposed to be the most dangerous. It is the straighter flashes which do the most harm; those which are capable of breaking almost straight through the air without having to go out of their course to take advantage of any little conducting matter, such as moisture, which will assist them on the way. The meandering flashes are not by any means to be ignored; it is only in comparison with the straighter ones that they are mild.

In arranging what parts of a building require protection, we have to consider the various points in the sky from which the discharge may originate, and so arrange our system that the conductor, or one of its branches, will form the nearest part, no matter from what direction the discharge may come. There is, of course, a limit to the angle of obliquity, and this limit should be about 40 degs., and my observations have led me to infer that the greater the angle of obliquity the milder the discharge. We hear reports sometimes of buildings having been struck by lightning in absolutely unaccountable places, such as lightning missing a tall spire and striking the nave close underneath it, or even striking through a window. Like all other so-called vagaries, freaks, or perversity of lightning, such peculiarities do not exist except in the minds of people who do not understand the matter. Lightning is a force of Nature, and, like all other natural forces, is governed and regulated by laws more unchangeable than those of the Medes and Persians; therefore, if we find cases which do not quite agree with our preconceived ideas, we must admit that we either do not know the law, or that we have overlooked some important factor of the case, and not put it down to a sudden and capricious change in the laws of Nature.

In arranging as to which parts to protect, we can consider this question as to which would be the nearest parts, and we can take it that these are parts which might be struck; other parts higher than these may be absolutely safe if they come well within a line drawn from one to the other, provided other circumstances are equal; but they may not be, for metals either inside or outside the building, and other circumstances, may complicate the question so far that this rule does not entirely apply. Notwithstanding all the difficulties that I have pointed out, absolute protection is possible if the building is thoroughly studied. We can either protect it so that we can say not a brick or stone shall be disturbed, or we may say we will protect it so that the inmates shall be safe and the building shall not be set on fire or damaged to any extent —we may say that a stone finial at this end may be knocked down, or a few bricks or tiles disturbed there, and that we will risk that, as we do not consider this damage worth providing against; but if we do this we must realise that we are running the risk, and if the stone finial is thrown down, or the bricks or tiles displaced, we must consider that we deliberately took the risk, and that it is not a failure of our system of protection.

In conclusion, I can only advise you not to make the general error of providing your conductors of exceptionally large size under the mistaken idea that by providing your conducting path of exceptional capacity, as it is wrongly called, you can ignore the scientific aspect of the question, for no increase in size of the conductor will compensate for this.

A letter was read from Mr. Killingworth Hedges, M.I.C.E., stating that he had read Mr. Hands's paper and agreed with him that the longer the subject was studied the more difficult it seemed. Mr. Hands had mentioned the advantages of having many points, but then went on to say that "they may not be able to prevent discharge"; this inability was, in his own opinion, only a question of their number; as usually installed without regard to intercommunication some might be inefficient, but on a properly protected building the number of points should be so distributed that the whole building was bristling with the so-called negative discharge, and therefore the actual disruptive effect was warded off. He had endeavoured to carry this out in the protection of Saint Paul's Cathedral, where there were over 100 points all connected with one another and at intervals to the earth. So convinced was he that this was the correct system that in the work now being installed under his supervision at Westminster Abbey the actual number of points in proportion to the area will be greater. He had already alluded to the researches of Dr. Oliver Lodge in his (Mr. Hedges's) paper entitled "The Protection of Public Buildings from Lightning," read before the Royal Institute of British Architects on April 23rd last year, and he begged to refer those interested to his concluding remarks under the head of Practical Questions, in which he had slightly altered Dr. Lodge's rules and added some of his own.

Park Lodge, Hull.—The lodge by Mr. Joseph H. Hirst, illustrated on the previous page, is proposed to be erected at the Anlaby Road entrance to the West Park, Hull. The ground storey is of red brick, and the upper storey of stucco. The roofs are covered with red tiles. The lodge contains parlour, kitchen and the necessary offices, all under the main roof, and three bedrooms on the first floor. Provision is also made for ladies' w.c.'s in a separate building. Mr. Hirst is the city architect of Hull.

By-Laws for Rural Buildings.—Mr. Long stated, in reply to a question in the House of Commons last week, that he was preparing a series of model by-laws with respect to new buildings in rural districts, which will deal only with matters most in need of control for purposes of health. The series is intended as a guide to rural district councils wishing to make by-laws on the subject, and will be specially applicable to places consisting of scattered dwellings. It will be competent to a district council in any particular case to propose any modifications and additions which appear to them necessary to meet the circumstances of the locality. The model is only intended by way of suggestion to the rural councils, with whom rests the initiative as to making by-laws.

ABERDEEN SLATERS AND ARCHITECTS.

A MEETING of Aberdeen master slaters was held recently to consider their position in regard to a circular issued by the Society of Architects raising points of considerable interest to the trade. The circular referred to is as follows: "At the annual general meeting of the society, held on March 3rd, the following motion was put to the meeting and carried: That the following method of schedule measurement for slater work shall in future be adopted by members of the society—Measurement to be nett, with the following allowances added, viz.: 18in. at piends and valleys, 6in. at eaves, 6in. at skews ends, window sides, and other voids. All circular work to be stated separately. It was also moved and carried—That, in consideration of fourteen master slaters having agreed to tender to none but members of the Aberdeen Society of Architects, members of the society shall in future not send schedules to or receive tenders from others than the said fourteen master slaters, or from those who may join the Slaters' Association to be formed by them, this agreement to apply only to work within the city boundary. At a subsequent meeting of the council of the Architects' Society, it was intimated that the number of master slaters who were willing to conform to the above agreement had been reduced to eleven. The council nevertheless seemed to let the resolution stand, the names of the following masters being substituted for the fourteen who had previously intimated their willingness to abide by it: Alexander Murray, King Street; A. E. Merson, Bon-Accord Street; George Farquhar, Union Row; Alexander Law, Little Chapel Street; William Reid, Osborne Place; J. & A. Milne, North Broadford; Alexander Smith, Albyn Lane; William Coutts, Chattan Place; A. Harper & Sons, Summerfield Terrace; George Davidson, Thistle Street; and Charles Maitland, Union Grove. Members of the society are therefore requested in future to conform to the above resolutions. John Rust and A. H. L. Mackinnon, joint hon. secretaries."

The promoters of the recent meeting held that the eleven master slaters who had intimated their willingness to abide by the resolutions of the architects formed only a third of the master slaters of Aberdeen, and had no authority to voice the opinion of the whole trade. The names of the other firms or individual masters not mentioned in the circular quoted were as follows: Messrs. Adam & Co., George Bain, Peter Brodie, James Clark, John Copland, William Copland, Messrs. Currie & Co., Messrs. James Duncan, J. D. Farquhar, James Forbes, Duncan Grassick, James Harper, J. M. Macdonald, Adam Martin, Merson & Stewart, Forbes Morrison, George Steele, James Wilson, James Wright, Robert Stuart, John Durnin, William Clark and William Sheret.

Of the last-mentioned masters, fifteen were present at the meeting. Mr. Peter Lewis (of Messrs. Adam & Co.) was called to the chair, and Mr. J. D. Farquhar was appointed secretary of the meeting. A general discussion took place with reference to the circular and the resolution of architects, the general opinion being expressed that the architects could not have been aware of the fact that all the master slaters in town had not been consulted with regard to their proposals. Some of those present said they had never heard of those proposals until after the circular had been issued. The architects, it was stated, had since themselves learned that the masters who had agreed to their proposals did not represent the whole of the trade. It was also stated that every master slater in Aberdeen had been invited by advertisement and circular to attend that meeting, so that no hole-and-cornerism could be alleged.

Mr. D. Grassick moved "That the members present form themselves into an association to take action on their own account, and to approach the architects in regard to the proposals," and the motion was unanimously carried. Office-bearers were then appointed as follows: President, Mr. Robert Kincaid (Messrs. Currie & Co.); vice-presidents, Messrs. Forbes Morrison and D. Grassick; secretary, Mr. George Mackenzie, solicitor (Messrs. Mackenzie & Wilson); treasurer, Mr. Robert Stuart; committee, Messrs. James Wright, P. Lewis and James Wilson.

ROYAL VICTORIA HOSPITAL, BELFAST.

DESCRIPTION OF THE BUILDINGS.

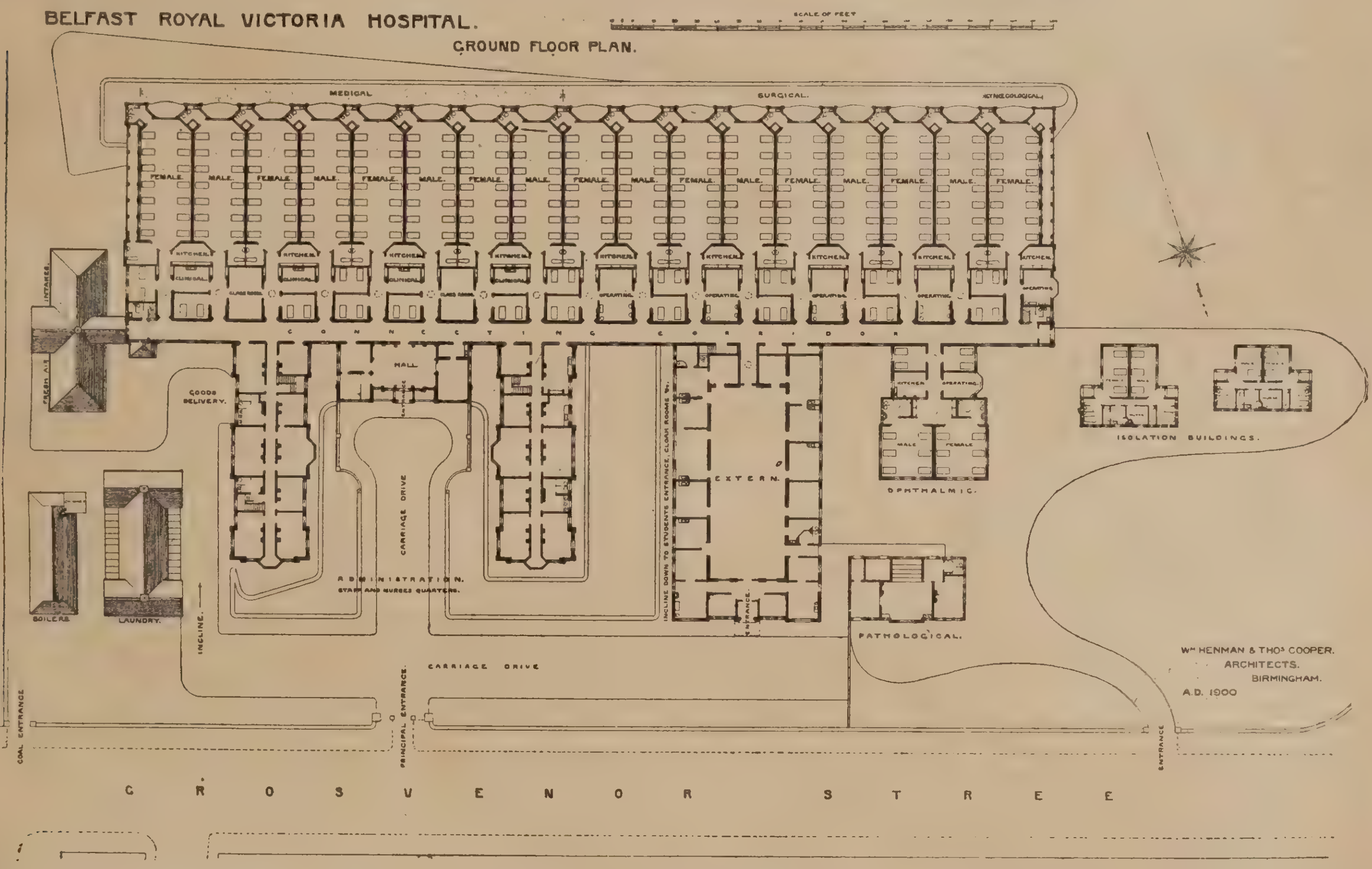
THE new Royal Victoria Hospital at Belfast—of which we give a plan below, and, in the centre plates, views of the administrative building and wards—is now in course of erection from the designs of Messrs. William Henman & Thomas Cooper, architects, of Birmingham, the contractors being Messrs. M'Laughlin & Harvey, of Belfast and Dublin. Arrangements had been made for the laying of the foundation stone on April 18th last by the Prince and Princess of Wales on behalf of her late Majesty Queen Victoria, but the royal death necessitated the abandonment of the ceremony. His Majesty the King has, however, graciously expressed his desire to lay the foundation stone at a later date. Accommodation will be provided for 300 patients, eight resident medical and surgical officers, seventy-six nurses, and thirty-two male and female attendants and servants. The principal entrance to the site, which is six acres in extent, faces Grosvenor Street. The administrative department of four storeys and basement, in three separate buildings on the north side, provides a spacious entrance hall (above the porch of which is a statue of Queen Victoria), and accommodation for the resident staff, the nurses' home, the attendants' and servants' quarters, the dispensary and the kitchen department. On the south side of a main corridor, running east and west, are the wards, side by side without intervening space, and practically under one roof. Each ward is for fourteen beds, eight being for medical, eight for surgical, and one for gynæcological cases, with their accessory rooms approached by branch corridors. The wards are alternately arranged for male and female patients.

In connection with each group of four medical wards there are a large classroom and two clinical rooms, and to every pair of surgical wards there is an operating room. On the north side of the main corridor are the ophthalmic wards—two of six beds and two of two beds; also an operating room. Near each of the seventeen large wards is a separation ward for two beds. A ward kitchen serves for each pair of wards, except for the gynæcological cases, where the department is self-contained, with separate operating room. Bathrooms and conveniences are attached to all the principal wards, and linen cupboards and stores for patients' clothing are provided. Two detached buildings are for isolation purposes, one being for six beds, the other for four, with kitchens, convenience and nurses' bedrooms. To each of the fourteen-bed wards there is a large window at the south end, opening on to a balcony, from which there is a view over park-like grounds to the hills beyond, and from end to end of the wards there are lantern lights; consequently, as the only lofty buildings are on the north, whatever sunlight there may be throughout the day is admitted to the wards, or may be regulated to requirements by the provision of green draw-down blinds. The compactness of the arrangement of the wards not only simplifies administration and reduces labour to a minimum, but it lends itself to the "Plenum" system of ventilation more readily and with more certain results than with wards one above another in buildings of several storeys.

To the west of the administrative buildings is the out-patients' or "extern" department, consisting of a large waiting hall with a number of medical and surgical consulting rooms around on the ground-floor level; while in the basement there are retiring rooms for the use of students attending the Hospital. The appliances for securing ventilation are in a separate building at the east end of the main corridor, connected with the Hospital at the basement level by the principal air-inlet duct, which is 20ft. high by 9ft. wide at that end. The air in-take building contains what may be regarded as the lungs of the hospital, because by means of the appliances there installed the whole of the fresh-air supply is drawn in, filtered through moistened screens, warmed in cold weather, and forced on by means of powerful air propellers in quantity sufficient to change the whole of the air in the Hospital seven times per hour in winter and ten times per hour in summer without opening any windows. The appliances are all in duplicate, each of sufficient capacity or power to supply the minimum amount of air required, so that all necessary cleaning, rest and repair of the machinery may take place without stopping the air supply.

The knowledge and experience which the architects have acquired of "Plenum" ventilation have enabled them, in conjunction with Mr. Henry Lea, the consulting engineer, to adopt improved appliances, and to simplify and cheapen the cost of maintaining their efficiency; and, by utilising the exhaust steam from the engines in securing the necessary supply of hot water throughout the establishment, it is estimated that very little additional cost will be incurred for a system of ventilation far more efficient than can be obtained by the ordinary methods.

There will be a complete steam laundry in a detached building on the premises, together with disinfecting apparatus and a destructor. The pathological department, including a laboratory, post-mortem room, mortuary and a viewing room, divided off by a glazed screen, is provided for in another detached building. For the elevations stone is used, combined with specially manufactured sand-faced bricks of a good red colour. The cost per patients' bed will not exceed £300, an exceedingly low figure for such a complete and up-to-date hospital.


BELFAST ROYAL VICTORIA HOSPITAL.

GROUND FLOOR PLAN.

THE ARCHITECT AND THE GLOVES.

THE Paris correspondent of the "Daily Telegraph" asks the following question: Can a railway guard be compelled by passengers to wear gloves? A squeamish architect, who lately travelled in the Dieppe-to-Paris express, considers that the answer is in the affirmative. The Courts, however, have decided otherwise. On the occasion referred to the gentleman was asked for his ticket by the guard who wished to punch a hole in it. He was just going to comply when a look of horror came over his face. "Where are your gloves?" he exclaimed, in a shocked tone. But the railway official bluntly replied that he had not any gloves, that he was not going to get any, and that his bare hands were good enough for the likes of the architect. The latter after this declined either to continue the conversation or to give up his ticket until the guard should put gloves on. As the guard never did so the ticket never got punched, but the passenger received a summons to appear before the magistrate for his refusal to comply with the company's by-laws. In court the architect explained his case in the politest but firmest way possible. But the judge fined him £4.

NEW BUILDINGS IN MANCHESTER.

ANOTHER CRITICISM.

IN our issues for November 14th and December 26th last we took the liberty of reprinting from the "Manchester Guardian" two criticisms of buildings recently erected in that busy city. A further criticism has lately appeared, which we give below. It is much to be desired that intelligent comment of this kind should more often be seen in the columns of the daily press, against some of whose members a heavy account lies for setting up before the public standards of architecture which are entirely false.

Our Manchester contemporary remarks: St. Athanasius used to say, "One must not be tired of repeating." The same faults reappear, so that very much the same criticism has to be applied again and again to the buildings rising up in our midst. At Old Trafford, on the way to the Ship Canal, is a fine pile of building bearing the name "Duckworth's, Manufacturing Chemists," but its redness is too uniform. The walls and front roofs and the doorways and window openings are all of a vivid red without any relief, and such good material has been used that the vividness of the red will probably remain. Had there been better detail—for the detail is not equal to the general design—and if two well-chosen colours (say such as there are at St. Mary's Hospital) had been used for the terra-cotta and brickwork, and brown or purple tiles for the roofs, this building would have taken fairly high rank. There are slated roofs behind. It would have been better to have chosen slates or tiles, and have kept to one, for the same building.

Grand Opportunities.

Here and there in Manchester are some wonderfully good sites. Look at the north end of Albert Square, or the east side of the Cathedral Yard, or the north and south ends of Ardwick Green, or the south-east corner of Albert Square. How have these grand opportunities been used or missed? In Albert Square the great mistake made in Liverpool is not being repeated, namely that of trying to design the range of new buildings in the style of the Town Hall. Civic Buildings, though not very powerful or original, is a distinctly satisfactory building in its general treatment and careful detail. But why are the more easterly chimneys brick? They are much seen. And why are all the chimneys so commonplace? There are endless examples of good chimneys all over the country and abroad. In many a small town or village beautiful chimneys are to be seen, the making of the house or shop or lodge or cottage of which they are part. In days gone by chimneys were welcomed in a design, and they helped much in imparting life and vigour. Now they have come to be regarded by the public with regret or reproach, and the feeling is almost justified by the unworthy treatment they often receive. In this Albert Square building, too, there is, in the side street, brick just "butted" up to the stone, with no more blending than of oil and water. The skyline has obviously been considered, but not worked out quite sufficiently. The roof dormers would have been better for giving light, and also in appearance, if of twice or thrice their size.

The Whitworth Hall of Owens College

grows on one as it grows. There is very little carving, and that little is well placed. The heraldic work will perhaps yet be a little more boldly cut. At Oxford and Cambridge the college arms are carved, as a rule, with daring boldness, yet with such excellent effect that others might well take courage. In this building, too, there is an entire avoidance of the sort of "ornament" so much in vogue, and used so often to hide the poverty of design. The south gable promises well, with its fine window flanked by plain masonry on either side. In this hall there is dignity without the cast-ironness which has hitherto abounded at Owens College. The seven pedestals, presumably for statues, on the east side of the hall lead one to hope that the figures will be very boldly and vigorously sculptured, not too smooth and delicate for the height—as are, for instance, the recent figures for the north-west tower of York Minster. One is sorry that in all this vast group of costly buildings the chimneys are in no case treated with the respect due to a chimney.

Those of the public who have not made a serious study of architecture should remember that the exterior taken alone is not architecture. The plan and arrangement of the interior must be considered in connection with the outward manifestation. A fine front may be little else than a mask, and however admirable in its way that may be, it is not architecture. The genius of Sir Charles Barry enabled him to clothe a convenient plan and effective interior with a stately and graceful outward form—witness St. Stephen's, Westminster, or many London clubs, or our own Athenæum before it was maltreated. Bridge Street Chambers have at the street level six shops with a centre door, the whole with a brick and stone front. The conditions and requirements are such as to lend themselves to an effective building, yet the result is somewhat tame and commonplace. Another building of much the same sort is Central Chambers, in Brazennose Street. Brick and stone make an admirable combination in a facade, but much depends upon the way they are disposed. The great block of building, the Corn and Produce Exchange, with shops, on the east side of the Cathedral Yard, has, with the Cathedral in the foreground, one of the best sites for architectural effect in the city. But it is all stone. Is it to match the Cathedral? one wonders. It would have been better for both had much of it, if not nearly all, been red brick. A praiseworthy attempt to design on an exceptionally bold scale has been made; but it misses complete success, though it comes as near it, perhaps, as the National Liberal Club on the Thames Embankment.

Though in a confined and difficult site, it looks as if

St. Mary's Hospital

in Oxford Street was going to be, in outline and general design, one of the best of our brick and terra-cotta buildings. The colouring, too, is good, and will probably, if treated to the Lancashire yearly wash, remain so. It is not too magnificent to be suitable for a hospital, yet there is nothing too plain or paltry about it—except the back bit on the canal bank, which really does cry shame. The architect is a strong man; why did he not put his foot down and demand permission for a treatment consistent with the street front, if less costly than it? As to the washing of our buildings, when the best brick is used, rain, where it can get at the bricks, will keep them fairly clean. It is obvious, therefore, that careful washing of those parts which are more or less sheltered from driving rain would be effectual. With stone it is otherwise, in such smoke-laden air as this. Stone buildings, like trunks of trees, in Lancashire become and remain very much of one colour, if black be a colour.

A Conspicuous Building.

One of the most conspicuous of recent buildings in Manchester is that on the south side of St. Mary's Gate. Here there has clearly been liberal expenditure, but the effect obtained is not commensurate with the efforts made in attaining it, and the ponderous mass of superstructure, seemingly carried on the thinnest and lightest of woodwork, excites (though no doubt it is really strong enough) an uncomfortable sensation. Higher up, again, the pair of wooden oriel windows of slim construction have the appearance of sustaining heavy stonework above. There is here a great deal of carving and ornament likely to catch the dirt.

Bridges.

All over the city one sees bridges—usually covered—high up, for access from one warehouse or other building to another. Such bridges might always be (without going as far as Lucerne for a model) picturesque and delightful. Yet is there one that answers this description? Even at the temple of learning in Old Millgate the covered bridge leading from the southerly part to the northerly is not only as hideous in itself as it well could be, but it partially conceals and wholly mars the ancient and picturesque east gateway to the Chatham Hospital. It might have been put there to show the boys of the Grammar School what should be avoided. One thing, by the way, which is not avoided enough in our recent buildings is "the diseased desire for uniformity," which craves to make everything correspond with something else. The name of a suburban villa is often on both gate piers, even if not 1½yd. apart. It would be more useful if, the name of the house being on one, the number of the house and the name of the occupier were on the other.

New Churches.

There would be more churches to notice were it not that a "tin tabernacle" so often acts as *locum tenens* for a brick or stone building. There is the easterly portion of a church in the Wilbraham Road, south of Manchester. It looks fairly church-like, and there is a welcome absence of vulgarity. In St. Werburgh's brick and terra-cotta are mainly used, and the effect would have been better if the red bricks and the terra-cotta had been brighter. This church has the fault, common to so many such buildings, of being a rather commonplace stone design carried out in plastic materials. It adds much to the interest and artistic value if the materials are allowed to rule, or at least to influence, the design. Canon Hoskyns at the Town Hall recently spoke up well for the right kind of churches. He showed the benefit to the community of dignified and beautiful churches, especially in squalid districts. He dwelt, too, on the importance of making the inside specially impressive and devotional. It would be well if the Vicar of Bolton would speak oftener and at greater length on this subject, which he is so well qualified to handle. If only the Chair of Architecture at Owens College, which seems to come nearer, be established, and be, as it doubtless will, worthily filled, it is to be hoped that in time not only will more of our architects learn architecture as an art, but that the public will become sufficiently interested in the art to be able to distinguish good work from bad.

WESTON-SUPER-MARE ELECTRIC-LIGHT STATION.

THE scheme for providing Weston-super-Mare with electric light undertaken by the Weston-super-Mare and District Electric Supply Company, is now rapidly approaching completion. Continuous current, generated at the supply station in Locking Road, is brought by means of concentric feeders to three feeding points—one situated at the junction of High Street and Regent Street, another in the Knightstone Road, and a third in Beach Road at its junction with Ellenborough Park. At these points a supply of current is given to the three-wire distributing network, from which services are taken to consumers—the arrangement being such that the latter can be supplied at a pressure of either 230 or 460 volts to suit requirements. At various points on the network disconnecting fuse boxes are placed, enabling a street or portion of a street to be cut out for connections to be made without any interruption to the general supply. Three spare earthenware conduits are also laid to various points to provide for extension feeders. The contract for the whole of the work in connection with the mains has been carried out by Messrs. Callender's Cable and Construction Company. The architectural design of the generating station was placed in the hands of Messrs. Wilde & Fry, who are also architects to the Penarth Electric Lighting Company. The builders were Messrs. Charles Taylor & Sons. The front of the building faces west, and is occupied by commodious offices for engineers and clerks, and store-room. The engine-room, measuring 44ft. long by 25ft. wide, provides accommodation for two dynamos coupled to two high speed compound engines. The dynamos and boosters, together with the main generators and engines, were built by the Brush Electrical Engineering Company of London and Loughborough. The switchboard runs along the north wall of the engine-room. A 5-ton travelling crane traverses the engine-room at a height of 18ft. 6in. Adjacent to the north wall is the accumulator-room. The boiler-house adjoins the south wall of the engine-room, and contains two Babock & Wilcox water-tube boilers. They are supplied with water from an overhead tank by means of motor-driven pumps. The exceptionally hard Weston water is reduced to under 5 degs. Clarke, by means of a Desrumaux water softener. The lighting of the generating station has been done by Messrs. Bryant & Sons The entire work has been carried out under the supervision of Mr. S. G. Leech, A.M.I.E.E., the company's engineering manager, with the assistance of Mr. H. Holman.

CHRIST'S HOSPITAL.

Mr. ASHBEE'S PLAN.

DISCUSSION grows apace in regard to the proposed demolition of Christ's Hospital, and the clearing of the site for the erection of business premises (see p. 258 of our last issue).

Mr. C. R. Ashbee, chairman of the London Survey Committee, writes as follows: I have laid before the National Trust a plan for the treatment of the site which, though it may not yield to the supporters of the Bill now before Parliament the uttermost farthing for the estate and everything on it, still may claim to give them a very ample return. and to be drafted in the public interest without being unduly unfair to the Christ's Hospital authorities.

Broadly, the scheme implies the cutting of a new street east and west from Little Britain to Holborn Viaduct, and another north and south from the new street to Newgate, while it arranges for ample widening of Newgate Street along its north side. By this arrangement the following objects are gained:

(1) One-third of the existing open spaces are retained.

(2) The claim of Bartholomew's Hospital is satisfied, the northern portion of the estate being sold to the Hospital, together with an excellent approach, while in addition the Hospital gets the advantage of a good open space in front of it.

(3) The Post Office lights are protected.

(4) The most interesting portion of Christ's Hospital buildings, the Sir Christopher Wren parts, and the remains of the old Greyfriars' Monastery, are preserved, and could be acquired by the London County Council for a civic museum.

(5) The other Wren portion of the estate is saved, the Governors' Court Room remaining as such, and the existing buildings used as offices for Christ's Hospital authorities.

(6) Newgate Street is widened the whole stretch from Giltspur Street to Christ Church Passage, and the widening might be extended to the Post Office Station.

(7) Any remaining portion of London Wall and the Town Ditch is saved as an historic record to the City.

(8) Newgate Street traffic is relieved by the new street from Little Britain to Holborn, the idea being later on to widen Little Britain with a view to getting a direct route from Aldersgate Street to Holborn Viaduct.

(9) A fine architectural feature is secured to the City by isolating the Greyfriars' Monastery, throwing the Wren facade open to Newgate Street, with Christ Church and its open space in front. and the other open spaces at the rear.

(10) A good block of offices and shops can be planned in the triangle made by Newgate Street and the other streets on the western side of the property at a large profit to Christ's Hospital.

(11) By thus handling the whole site, in part for building and in part for public open spaces and new roads, Christ's Hospital will be able to receive full value for the bulk of their property.

The only thing that is to be regretted in this scheme is that the Great Hall, which, though comparatively modern, is a very fine and stately building, has to be sacrificed.

A plan showing my scheme may be inspected at the offices of the National Trust, 1, Great College Street, Westminster, by anyone interested, and I trust that before proceeding with their present Bill the Governors will carefully consider whether some such method of dealing with the site is not practicable.

The "Pall Mall Gazette" makes the following remarks respecting the new buildings now being erected at West Horsham from the designs of Mr. Aston Webb, A.R.A.: "As you approach the schools from the road from Horsham the thick red line of buildings strikes you as appallingly ruthless in its ugliness. Red, red, red—red everywhere! Red walls surmounted by red tiles, except in the case of one merciful exception—the great dining-hall, the green Cumberland slates on the roof of which are a mercy to sorely tired eyes.

"Some day the red nakedness of this glaring patch of buildings may be screened by relieving avenues of green; but for the next generation, we fancy, the eyes of all concerned will suffer for it. It seems like straining at a gnat to have cut down the stone decoration originally proposed; as against the hundreds of thousands which will have been spent by this time next year the saving of a few tens of thousands was not worth the candle at such a cost! Æsthetically we fear the new schools come near failure. But there is another side to the picture. For the grouping of buildings, with a view to convenience in the practical working of all sides of school life and to the health of the boys, we believe the new Christ's Hospital will prove a complete success and an eye-opener to school authorities for the future. The centre quadrangle—the hub of the school life—with its school hall and flanking classrooms, is skilfully connected with the residential blocks by means of covered ways; the boarding-houses are models of convenience and sanitation; and there will be a wealth of playing-field accommodation. Library, drawing school, science school, common rooms have been provided on a liberal scale and on the most approved principles. Wherever the boys' interests are concerned a free hand has been displayed. This makes it the greater pity that the work has not been completed in true proportion. The docking of the external ornament to effect a comparatively small saving was poor policy, and equally so is the somewhat meagre way in which the requirements of the teaching staff are to be met. Married quarters are inadequate; and in the houses that are provided one cannot fail to notice the niggardly scale on which reception-rooms have been planned, just as though there was not plenty of ground for the using. In buildings destined in the ordinary course of things to stand some two or three centuries a little less of bricks-and-mortar parsimony would have been seemly."

ELECTRIC LIGHTING.

Some Particulars of Mr. Tesla's New Lamps.

MANY years ago Mr. Tesla was struck by the idea of producing artificially those oscillations of enormous rapidity in the minute particles of matter in a very attenuated, *i.e.*, gaseous, state, which, after being communicated to the ether, are transmitted by its waves and reach us in the form of light.

The theory itself had occupied the attention of some of the greatest scientists long before Mr. Tesla's time, but its practical application remained an unsolved prolem, excepting some laboratory experiments foreshadowing a solution, the most brilliant and promising of which were those successfully carried out by the young Austrian inventor himself; while to find the means of producing and utilising these oscillations in a simple and economical manner for the production of light, and to make this light a commercial success, was the chief among the many difficulties that had to be overcome ere there could be a question of bringing this form of illumination within the reach of the public at large.

This difficulty, Mr. Tesla informs us through the "New York Sun," has now been overcome, and he is able to produce light on the basis above indicated at a cheaper price than that which we have to pay for light derived from any of the sources used for illumination at present. The general features of a domestic installation for producing this new form of light are the following: The electric current, continuous or alternating, is derived in the usual manner from the street mains, but instead of being directly conducted to the special spiral-shaped lamp it first reaches an apparatus in which it is transformed into the required oscillations of high frequency, which reach the metallically-coated ends of the spiral and, entering the glass tube, creating in the interior corresponding oscillations of the same rapid sequence, and so producing light.

There is no incandescence due to combustion of the gas, which, of course, would affect the life of the lamp and require its renewal. Those lower forms of waves known as heat waves are totally absent, or, at all events, not present in any perceptible degree, and the lamps remain unaltered for years, since practically the whole energy is converted into light. The economy, therefore, of this process of illumination, as far as the utmost utilisation of the source of light in the form of light is concerned, approaches the ideal.

This light resembles sunlight in its hygienic effect and ozonises the atmosphere, an effect which, however, can be at will either prevented entirely or increased to a degree just suited for the purification of the air, such as might be required in hospital wards. And last, but not least, the lamps may be fed by a single wire, and even, under certain circumstances, lighted without wires; so that the lamp may be moved from one place to another without hindrance.

PAISLEY ABBEY RESTORATION.

THE restoration of the ancient and beautiful Paisley Abbey and the clearance and improvement of its highly inartistic surroundings has been undertaken, but it will probably be some years before the work is accomplished. It is estimated that the restoration will cost £40,000, and the improvement of the grounds, including the removal of unsightly buildings, at least about £20,000. Already very substantial and visible progress has been made. By the end of the present year there will be thoroughly completed one section of the work, which has been divided into three. These divisions, as applied to the Abbey itself, comprise, first, the restoration of the north and south transepts and the erection of the under portion of the tower; secondly. the rebuilding of the choir; and thirdly, the building of the superstructure of the tower itself. The work is being carried out under the guidance of Dr. Rowand Anderson, Edinburgh, who carried through the restoration of Dunblane Cathedral. Mr. William Middleton is the clerk of works. So far as the first section is concerned, the work of the mason and builder is almost complete. The under portion of the tower has for the time being reached its level, rising to a height of 72ft., flush with the apex of the roof of the existing nave. The superstructure of the tower will be the last of the sections to be undertaken, but when completed it will reach the lofty height of 156ft. from the ground. The north and south transepts have also their masonry completely restored, and roofed. One of the objects of the whole work is, of course, the extension of the accommodation for the Abbey congregation, which has hitherto been necessarily limited to the nave, the only habitable portion of the fabric. With the completion of the transepts and under tower a very considerable area will be added to the available portion of the building.

The under tower is altogether new. It is erected on four massive stone piers, 9ft. square, having a depth underground of about 14ft. These piers rise to a height of 30ft. to large moulded caps, from which spring the four great arches forming the roof. From the caps to the soffit of the arches is a curve of 17ft.. and from the soffit to the apex ring of the roof about 6ft., the height from floor to apex being thus over 54ft. From the side of the north-east pier a circular stair rises to the tower. Branch passages will encircle the whole church, giving access to all the different levels. On the first floor of the tower is a chamber 31ft. square with narrow slit windows; above this is a second and third floor, which complete the present height. The present operations extend to the famous Sounding Aisle In the course of the work it was found that its north wall, which joins the transept, was in a much less stable condition than had been suspected, and considerable difficulties were encountered owing to the state of the foundation. The aisle has always been a self-contained chamber, but the masonry of the two arches in the north wall has been permanently removed, giving immediate access to the transept.

Besides the larger operations, smaller repairs are being executed. Windows in the north and south walls of the nave are being renovated, broken portions of the mullions and tracery being replaced. The magnificently-traceried old window in the north wall of the north transept was not included in the present contract, but it is also receiving the attention of the renovator. The foundations were in a bad state, and they are being underpinned. As a matter of fact, the wall is about 6in. off the plumb, and but for the strengthening it is undergoing, its condition might cause anxiety. It is understood that a stained-glass window will be inserted when it is thoroughly repaired. The stone being used in the new buildings is from the quarries of Blackpasture, in Northumberland; Grange, in Fife; and Giffnock; with white spot from Beith quarries. In the course of the work of excavation many relics of past ages have been discovered by the workmen. One of the most interesting was that of two finely-chiselled stones, 5ft. 8in. by 1ft. 10in., found at the bottom of the foundation of the west pier lying side by side in a bed of sand. On the face of each are elaborate carved crosses, as plainly discernible as if executed but a short time ago. whereas it is computed that the stones are at least 600 years old.

Not the least important part of the whole undertaking is the projected clearance and improvement of the surroundings of the Abbey and the Town Hall on the opposite side of the street. The mean old houses in Smithhills Street, bounding the churchyard on the north, will be swept away, opening up good views of both buildings. The Abbey Close U.F. Church, which is opposite the Abbey, adjoining the Town Hall, together with a number of neighbouring buildings will be pulled down, giving from Dunn Square an uninterrupted view of the whole Abbey front. The houses, outhouses, &c., from the Place of Paisley in Abbey Street to the Graham Institute in Cotton Street will also be cleared away. Afterwards the churchyard will be laid out and maintained as an open space, and surrounding grounds will be similarly treated.

NEW Y.M.C.A. PREMISES AT BURTON.

NEW and more commodious headquarters for the local Y.M.C.A. are being erected in Burton. The new premises extend from High Street to Friars Walk, with a frontage the whole depth along Whitehurst's Passage. The main entrance will be in High Street, and leads from the entrance passage into a large entrance hall, about 20ft. square; from this entrance hall access may be obtained to all parts of the premises. On the ground floor will be found a private room, to be utilised for the general secretary's office, which will be so furnished and fitted that the secretary will be able to see everyone who may enter the building. Beyond this room is a large recreation and tea room, boiler house for the heating apparatus, and a complete lavatory block with bath-room, &c. Connected from the entrance hall by means of a glass-covered corridor is the gymnasium, the length of which is 48ft., the width 29ft., and the height to ceiling 19ft. This room will be provided with a glazed brick dado and a boarded ceiling, and is fitted with strong bearing pieces in the roof for receiving the various gymnastic appliances. The remainder of the ground to Friars Walk is occupied by the lecture hall (82ft. long, 30ft. wide and 26ft. high to the ceiling). This large hall will have a wood-block floor sloping from the entrance end to the platform, and will have a wooden dado 6ft. high; the roof will be of heavy pitch-pine timbers, resting on carved stone corbels, and all the woodwork is to be stained and varnished. Entrance and egress may be obtained by means of five doorways in this hall, and all the doors are made to open outwards. In connection with this hall are gentlemen's and ladies' cloak-rooms with lavatories attached. On the first floor, which is approached by a stone staircase, is provided a well-lighted reading room, with an opened timbered roof, and the various other rooms consist of committee-rooms, class-rooms, photographic studio and dark-room, with rooms for the caretaker. In addition to the portion of the premises occupied by the Y.M.C.A., other portions of the premises have been let off into suites of offices and a café restaurant, with its kitchen in the basement. This portion is well built in cement-concrete and white glazed brick, and in excellent light is supplied by the prismatic pavement lights. The whole of the premises will be lighted by electricity. The general contractor for the works is Mr. R. Kershaw, of Princess Street, and his sub-contractors are Mr. A. Geary, of Ordish Street (for the joinery), Messrs. T. Turner & Son (for the plumbing and painting), and Mr. T. Biddulph (for the plastering and concrete floors). The architect is Mr. Thomas Jenkins, of 35, High Street, Bristol.

NEW CHURCH AT SUNDERLAND.

A NEW church at Sunderland is being erected, in connection with the Fawcett Street Circuit of the Wesleyan Church, at the corner of Durham Road and Tunstall Lane. The new building here, which will be known as the Durham Road Church, is to cost about £9,000, or a total, including the cost of the site, of £15,000. There is also provided for in the scheme of the circuit a new church at the top of Chester Road, which will cost £6,000; and a third in Trimdon Street, which will take £5,000 to erect. The total estimated outlay on the three is, therefore, roughly speaking, £26,000. The Durham Road Church has already been commenced, and plans have been passed for the other two, the foundation stones of which will shortly be laid. The style of architecture will be Gothic, and the buildings are to be faced on all sides with stone from Pateley Bridge, whilst the dressings will be of Blaxter and Woodburn stone with Denwich tracery. The church will be cruciform in plan, and is entered by spacious vestibules at the junction of the two roads. At each side of the main entrance is a staircase leading to the gallery, there being also a separate entrance to each transept. At the rear of the church are ministers' and choir vestries, with direct access to the pulpit and choir stalls, the organ being placed behind the pulpit. The church is being built to accommodate 800 worshippers. The benches, pulpit, choir stalls, &c., will be in the best selected pitch-pine, whilst the windows will be glazed throughout with cathedral leaded glass. Behind the church there is a spacious schoolroom with gallery running round, off which eight classrooms open. There is also a large school for infants, together with other meeting rooms. The buildings will be heated and ventilated on the most improved system, and the premises throughout will be lighted by electricity. On the left hand side of the church will be a tower and spire of noble proportions, rising to a height of 100ft. The architect is Mr. J. Jameson Green, of Adelphi Chambers, Liverpool, and the building contract is let to Mr. J. B. Stott, of Sunderland. Mr. W. A. Lowry, of Liverpool, is clerk of works. It is expected that the schools will be completed by July this year, and the whole of the buildings by January, 1902.

HETTON-LE-HOLE CHURCH.

A NEW church at Hetton-le-Hole was consecrated last week. The church is estimated to cost £5,000. The parish of St. Nicholas, Hetton-le-Hole, is one of many daughters of the old parish of Houghton-le-Spring. The old church of Hetton was built as a chapel-of-ease in 1832. In 1892 the advisability of restoring it was considered. In 1893, however, in consequence of the dilapidated state of its walls, and, further, by reason of the large increase in the congregation, it was determined to pull down the old and build a new and larger church. The new church, which stands on the site of the old one, was designed by Mr. S. Piper, architect, of Newcastle-on-Tyne, and is of the Early English style of architecture. It is a large building, and will seat 800 people. One of its chief features is a large chancel, in which, on either side, there are three rows of carved oak stalls, the work of Mr. R. Hedley, of Newcastle-on-Tyne. On the right of the chancel, looking east, is a side chapel capable of accommodating from sixty to seventy persons, in the east end of which is a stained glass window, which occupied a position in the old church. The other stained glass window, also removed from the old church, has been enlarged and placed in the south transept. The aisles of the church are narrow, with lofty arches and massive stone pillars. By the introduction of the narrow aisles and wide shallow transepts the whole of the congregation is well placed, both for seeing and hearing—in other words, the church comprises one huge nave, by means of which both priest and congregation are in full view and hearing of each other. At the west end of the church there is a baptistery, formed by an arcade of three arches, with octagonal pillars, over which is a five-light window. In the north-west corner the choir vestry has been placed—a large apartment suitable not only for the choir but also for classes, &c. The chancel is paved with black and white marble tiles, 10½in. square, the work of Messrs. Borrodale Brothers, of Sunderland. Within the sanctuary the tiling is entirely white. At the east end is the clergy vestry. The font, supplied by Messrs. Jones & Willis, London, is of Caen stone, with four marble columns. The pulpit is of carved oak, executed by Mr. R. Hedley, of Newcastle All the aisles are laid with wood blocks in herring-bone pattern. The builder was Mr. W Sparrow.

CHINESE BUILDINGS AND CHINESE WORKMEN.

ALL the world now has a deep interest in everything pertaining to China and the Chinese. In the issue of the BUILDERS' JOURNAL for September 19th, 1900, an article appeared on "The Chinaman as Clayworker and Builder," when a brief account was given of the walls of Pekin. In the building of this wall the Chinese followed a peculiar custom, borrowed from their Tartar neighbours. Whenever a workman died his body was entombed within the wall. In this manner it is estimated that 1,000,000 human beings found their last resting places in the walls surrounding Pekin.

The capital of China differs from any other city in the world. It has no towering spires or graceful minarets, no lofty chimneys or high monuments, no buildings or houses eight or ten storeys high, to be seen in the distance and to notify the traveller that he is nearing the city; nothing is to be seen from the outside but the walls, and these are obscured by the houses and trees in the suburbs.

Not only the history and customs of the people influence the style of edifice commonly erected, but religion is also responsible for a style familiar all the world over. The pagoda is peculiarly Chinese. The first thought of the Confucian after arising is to worship. There is a shrine in every house, where a tablet with the names of ancestors is kept. There the household does reverence to the memory of those who have preceded him, and prays that he may live so that those who follow him may hold his name dear.

A rich man may have a separate building for this purpose, which is his hall of ancestors; the less wealthy may have a room set aside for the purpose; and the poor usually have only a shelf, but the humble paper on the dirty shelf is as sacred to its owner as the illuminated tablet in the gorgeous hall of a rich man's ancestors.

The public temple is generally an imposing edifice, with figures of various gods, with appropriate symbols. The pagoda erected at the Paris Exposition as an exhibit of Cambodia was an exact facsimile of the hill of the Pnom-Penh, crowned by the king's pagoda, a building of gold, bas-reliefs and statues.

A profusion of rich ornamentation and an inextricable medley of allegorical figures and lotus flowers, garlands and fantastic animals—half monsters, half deities—give this pagoda a remarkable appearance. Rocks and groves protect the approach to the inaccessible deity, and even the Brahmas and true believers can only reach the summit by climbing a splendid staircase of about forty steps. At the threshold of the building, Buddha, in the beatific repose of Nirvana, seems to be awaiting offerings. The architect has tried to give the general effect of that characteristic grandeur which is found in all of the famed pagodas. Rows of wonderful decorations, in which figure the flora and fauna of the forests, mythical creatures of the Buddhistic Pantheon, cover the friezes and the bas-reliefs, invest the frontage and its accessories with that kind of extravagant and bold beauty which appears to be the result of combining the arts of India and Laos.

Of the crafts strangely followed by this wonderful nation there is much to be said. The carpenter at work and the primitive sawmill are both typical examples. The skill of the mechanics is marvellous. Foreigners are occasionally surprised in China to note the deftness of the people in many lines of handicraft, and the results accomplished in the use of cheap and crude tools and appliances; but the Chinaman, after proper training, will use Western tools, manipulate machinery, and reach results that will win him recognition for his skill and bring his services into requisition; and his faithfulness in work, his keenness of observation, his power of imitation will make these services more and more valuable.

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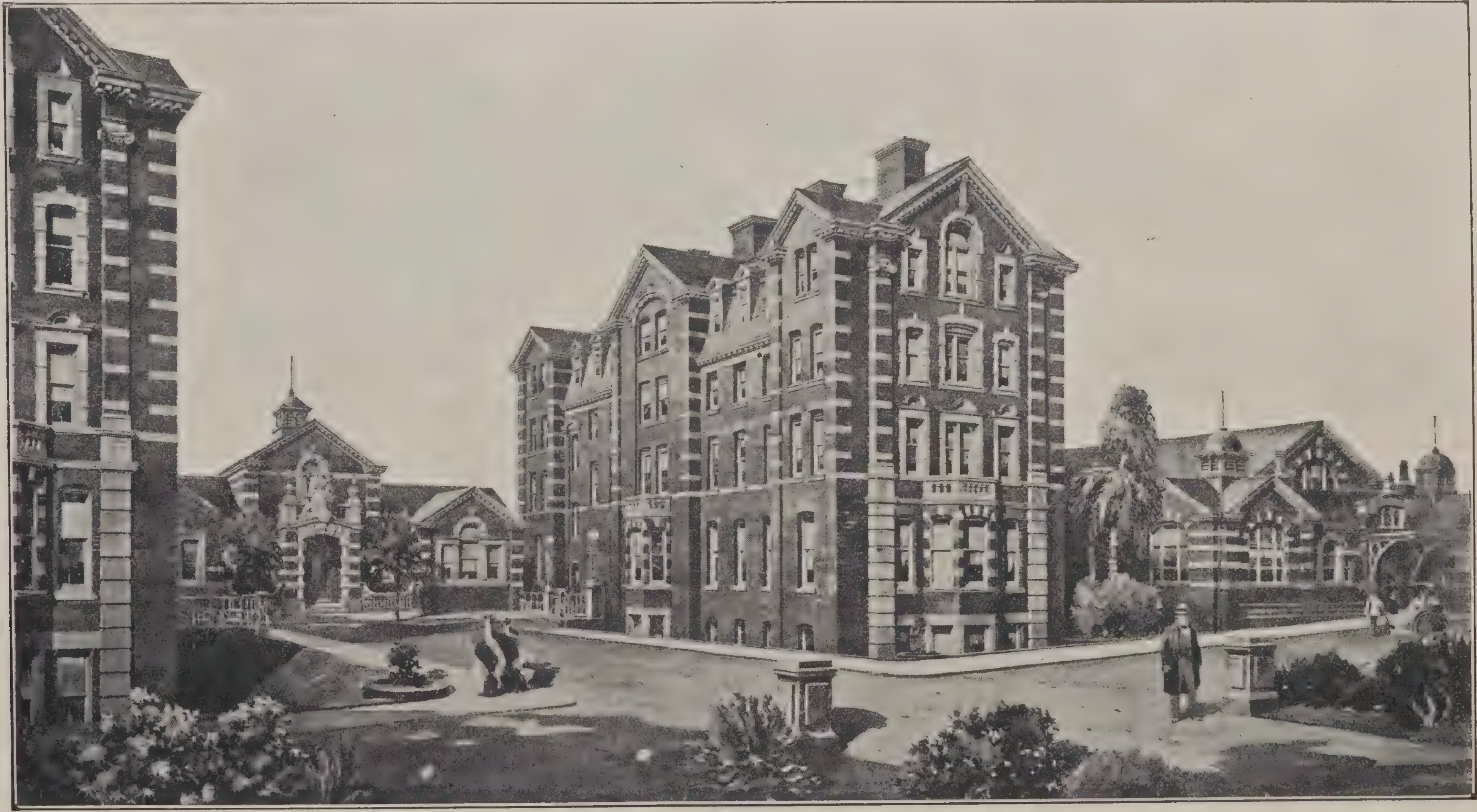
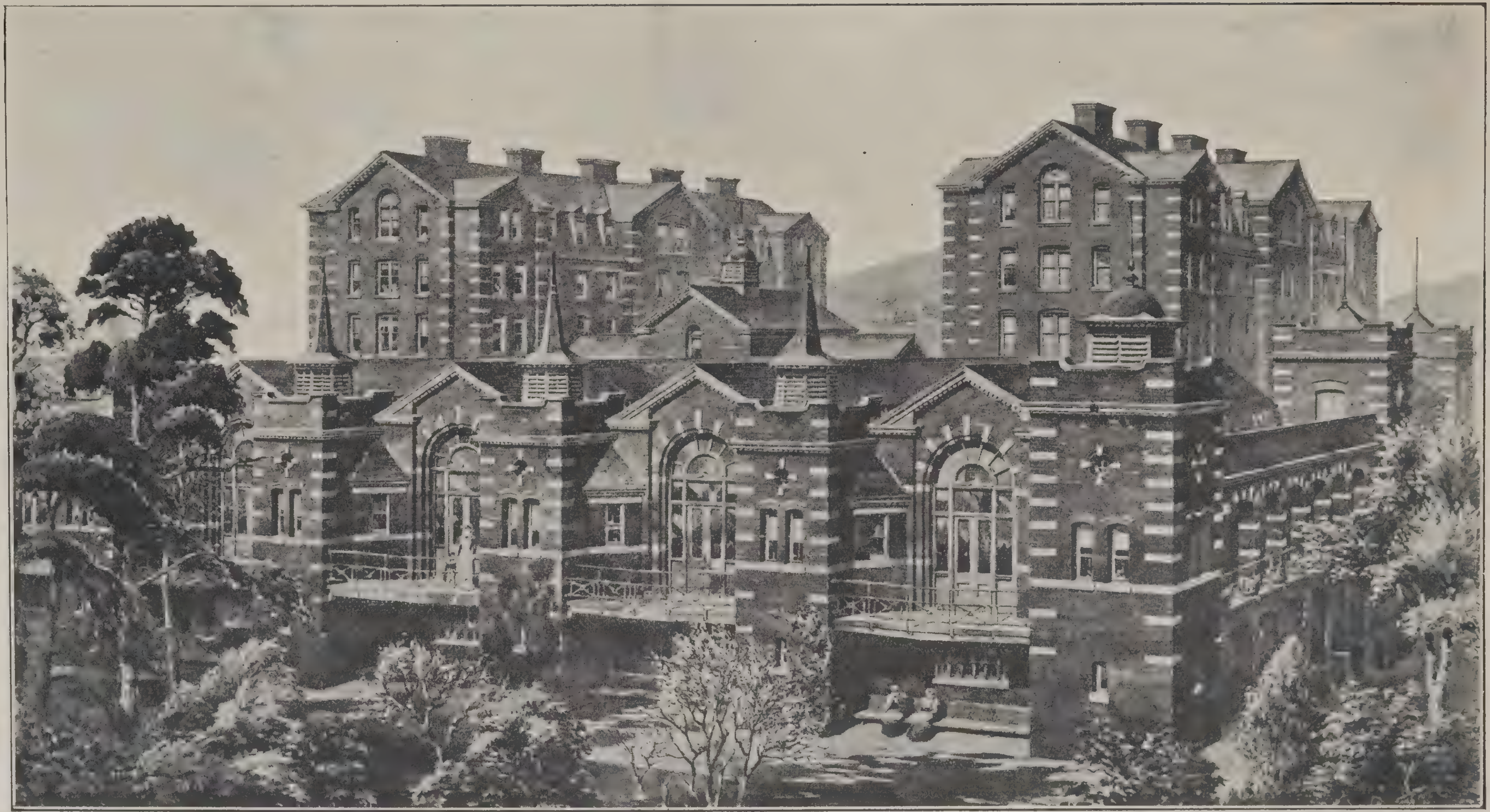
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, May 15th, 1901.



ROYAL VICTORIA HOSPITAL, BELFAST. THE ADMINISTRATIVE AND EXTERN BUILDINGS FROM THE NORTH-EAST.
W. Henman and T. Cooper, Architects.

Supplement to
The Builders' Journal and Architectural Record,
Wednesday, May 15th, 1901.



ROYAL VICTORIA HOSPITAL, BELFAST. THE WARDS FROM THE SOUTH-EAST. (Exhibited at this year's Royal Academy.)
W. Henman and T. Cooper, Architects.

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Bricks and Mortar.

APHORISM FOR THE WEEK.

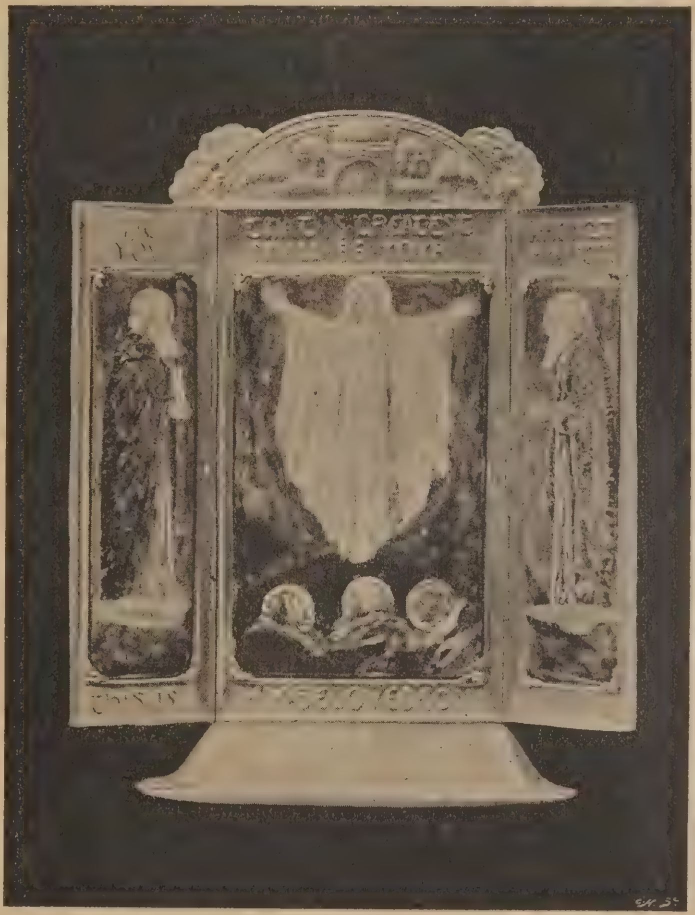
All Art is an imitation of Nature.—SENECA.

Our Plates. ASTON HALL, Birmingham, is one of the ancient homes of England "built for pleasure and for state" by Sir Thomas Holt, who commenced in 1618 and completed the building in 1635. For three generations the house remained in the possession of the Holt family, and during this time suffered considerably, as the damaged staircase and the cannon ball, both still preserved, amply testify. This was not as bad as what followed, for, getting into the hands of a building company, the park, originally of forty-three acres' extent, was being cut up for building land and the grand old avenues demolished. Fortunately our late Queen expressed a wish that the house should be saved, and, thanks to her interest, this was haply achieved, for it was bought by the Birmingham Corporation, restored, and in June 1858 thrown open by Her late Majesty as a recreation ground for the people. The Hall is now being used to exhibit various articles of interest. A slight rise after passing through the Church Lodge, with its curious ogee-shaped archway, brings one to the front of the Hall, and with its mullioned windows, quaint gables, stone balustrades, the turrets above the roofs and octagonal chimneys, quaint lodges and broad terrace forms, from wherever viewed, a pleasing picture for the artist or a wealth of detail to the architectural student. Internally the staircase, plastered ceilings, fireplaces and long gallery provide many bits worthy of study. Our illustration is from a drawing by Mr. Herbert Norman.—The houses near Bournemouth, by Mr. F. Winton Newman, are to be built with local red bricks, the upper portion to be finished with rough-cast, and the roofs covered with red tiles. The following accommodation is provided in each house: On the ground floor, sitting-room, parlour, kitchen, scullery and offices; on the first floor, four bedrooms, bathroom and w.c., and one attic in the roof.—A description of the new Royal Victoria Hospital at Belfast will be found on page 279 of this issue.

The Prix de Rome. FROM the moment a French lad enters a Paris *atelier* his thought and work combine to lead him to that alluring goal the Prix de Rome, since the winner is entitled to a course of study in the art galleries of the Eternal City. There are three stages in the competition for the prize. The first is a *croquis* in oils, the second a figure in oils, and then the great struggle begins. The successful competitors are given a subject, and, in order that their work may be evolved from their own imagination and executed without any friendly aid, each student is confined to a room in the Beaux Arts, and there for three long months he labours like a prisoner in solitary confinement. The final stage of the competition began the week before last, and the *déménagement* from the artist's own studio to his cell in the Beaux Arts is one of the most picturesque sights of Paris. All his painting properties, cooking utensils and musical instruments are packed in a fiacre, or—if he is poor—on a handbarrow, and he sets off hopefully for his lonely *loge*. Three months hence the students in some *atelier*—it may be at the Beaux Arts, it may be at Julian's School, will be sitting quietly working away at their easels, the smoke from pipe and cigarette floating upwards and encircling the model like a blue veil, when suddenly the door will burst open and a voice will cry "Victoire! nous avons le Prix!" A tumult of triumph will fill the studio, the model will be sent away, canvasses set aside, easels folded, and a *charge de cavalerie* organised. Easels will be turned into horses, and the students, astride them, with brooms, canes, umbrellas, &c., in their hands, will gallop round the throne, saluting as they pass the self-elected commander and shouting "Vive le Príx de Rome!" The pictures, sculpture, &c., are publicly exhibited before and after the judges award the prize. The successful student while studying in Rome must send a picture once a year to show what progress he is making, and if it be of outstanding merit it is purchased by the State. It may be mentioned that out of ten competitors for the Prix de Rome in sculpture this year six are pupils of the same master, M. Barrias. This is supposed to be the largest number of *concurrents* which has ever come from one *atelier*.

Preservation of Historic Buildings. MR. H. J. GLANVILLE, writing to the "Times," states that the movement for preserving the picturesque features and historic buildings of Hampstead has made considerable progress, and a memorial, largely and influentially signed, was presented recently to the Borough Council by a deputation of Hampstead residents, headed by Sir Richard Temple. "The great difficulty to be contended with," he says, "is that the Building Act gives no power to the borough councils, and but a limited power to the London County Council, as regards the control of building schemes. If a public body such as the London School Board threaten an historic building, the law obliges them to give public notice of their scheme. The result that attention is aroused, you are appealed to, and the threatened act of vandalism is prevented. But if the same building is threatened by a speculative builder he has merely to submit his plans to the district surveyor, and if the provisions of the Building Act are complied with, the plans are passed, and the historic building disappears without any notice having been given either to county council, borough council, or the public. A certain number of building schemes, however, viz., those in which the builder desires to be relieved from exact fulfilment of any of the provisions of the Building Act, come before the London County Council for consideration, and last year 2,320 schemes were thus considered. The Hampstead memorialists urge that the county council should be asked by the borough council to give early public notice of all such proposed building schemes in Hampstead where there is any reason to think that any public interest or the interest of any body of residents may be injuriously affected. In the case of historic buildings such public notice would probably result in the preservation of such of them as, because of their beauty or their literary or artistic associations, might be deemed worth saving. It is to be feared, however, that by reason of their limited powers neither the county council nor the borough councils can do much to save what yet remains of picturesque and historic London, and some alteration in the Building Act seems to be called for if the end in view is to be attained."

A Triptych in Metal and Enamels. THE triptych illustrated on this page is made of transparent enamels on copper and silver. The central figure is of brilliant pearly translucent white surrounded with night blue. The figures asleep on each side are gold, purple, green and blue. These panels are mounted in repoussé copper gilt. It was exhibited at the Royal Academy in 1899, and was made by Mr. Alexander Fisher, of 17 Warwick Gardens, Kensington, W., who is so well known for his work in recreating the art of enamelling.



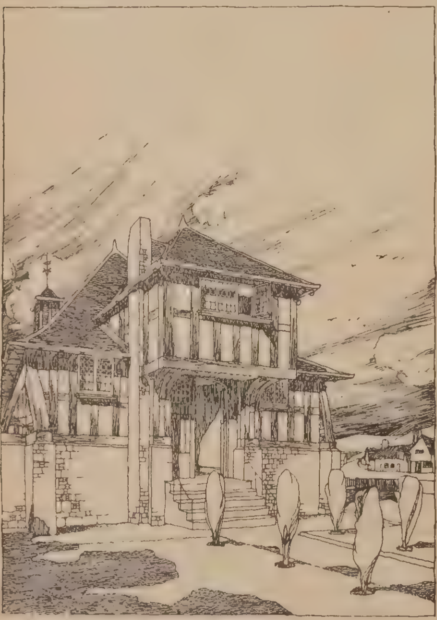
TRIPTYCH IN TRANSPARENT ENAMELS ON COPPER AND SILVER.
BY ALEXANDER FISHER.

The Queen Victoria Memorial. MR. H. DEVEY BROWNE, writing to the "Times," says: "If the statue of the late Queen is erected in the forecourt of Buckingham Palace looking down the Mall—that is, towards the north east—the face of the statue will be in shadow during the greater number of the hours of daylight, from 11 a.m., or earlier, till dusk. The sun, if it is shining, or in any other case the light, will be in the eyes of the spectators, who would certainly be much more numerous after 11 a.m. than before that hour. I do not think this has been suggested by any one better acquainted with such matters than I. It may be worth mentioning that, among existing monuments, the statue of Charles I. at Charing Cross, the Albert Memorial and the National Denkmal on the Niederwald face the south, the monuments of Bartolommeo Colleoni in Venice and of Gambetta in Paris face the west. It may be observed that I mix old and new, good and bad, for I do not presume to discuss the artistic merits, but only the aspect, of the monuments.

I think that English art cannot learn anything from modern German art—rather the reverse—so it may be relevant to mention that the monuments of Maria Teresa in Vienna and of the Emperor William I. in Berlin face the north-east. As the statue of the late Queen will be executed by Mr. Brock, it is certainly relevant to say that the statue of Her Majesty, also by Mr. Brock, recently unveiled at Hove, in Sussex, faces the south. One can judge from this figure how little could be seen of the dignified face if, looking to the north, it were illuminated only by reflected light from the roadway below. As the new statue will no doubt be under a canopy, the north side of the Albert Memorial is, perhaps, a better example."

Where the Memorial should be. HE goes on to say: "Supposing that my theory is correct, it seems that the new statue would be seen to advantage if the proposed memorial stood in the southern part of the Green Park, looking south or south-east over the large open space in front of the palace, with any arrangements of roads, terraces, and arcades that might be desirable. To refer again to existing monuments, the Albert Memorial in London and the Scott Memorial in Edinburgh are thus placed at the side of main thoroughfares, and the monument of Gambetta, though it faces the central avenue of the Tuileries gardens, is at the side of the roadway across the courtyard of the Louvre. The Niederwald monument is at the side of the Rhine and not on a promontory, as is, I believe, that of the Emperor William I. at Koblentz. The monument of Maria Teresa is at the side of the Ringstrasse in Vienna, and that of the Emperor William in Berlin—an example in other ways to be avoided—instead of looking over the open space by the river or canal, faces the long southern wall of the Royal Palace. If the memorial to Queen Victoria were placed in the position I venture to suggest, the face would be well lighted, and the background of the monument would be the trees of the Green Park instead of the very poor architecture of Buckingham Palace."

A Village Hall. THE village hall illustrated below was designed to accommodate 200 persons, with reading-room, library, scullery, stage and retiring room, and accommodation for caretaker over front entrance. The idea was to construct a purely half-timber building, the walls being built up of 9in. by 9in. posts. The hall is 50ft. by 34ft., and has a ribbed barrel roof, filled in with ornamental plaster-work. The drawing and design is by E. Stanley Mitton, of Oxford Road, Moseley, Birmingham.



DESIGN FOR A VILLAGE HALL.
BY E. STANLEY MITTON.

Law Cases.

Claim for Alleged Negligence in Making Valuation.—In the King's Bench Division of the High Court of Justice the case of *Harding* v. *Ewing* was heard on May 4th. Mr. Solomon Harding, of Chester, brought an action against Mr. Charles Anthony Ewing, architect and valuer, also of Chester, to recover damages for alleged negligence in making a valuation of certain house property at Liscard, near Birkenhead. Defendant denied negligence. It appeared that in 1898 the plaintiff, who was the secretary of a building society at Chester, was in negotiation with Mr. Allday, of Liverpool, with the view of making an advance on four houses at Liscard. The plaintiff instructed the defendant to make a valuation of the houses, and he did so, fixing the value at £2,100. Relying on this valuation, plaintiff said he made an advance of £1,250, and agreed to pay a further sum of £100 when the road on which the houses abutted had been completed. Subsequently plaintiff discovered that the valuation was too high, and he now submitted that the defendant was guilty of negligence in making the valuation, because in arriving at his figures he relied solely on information supplied by the mortgagor. Defendant contended that he was instructed by the plaintiff to get his particulars from the mortgagor, and that as those particulars appeared to be fair and reasonable he was entitled to rely on them. He further said that his valuation was correct at the time it was made. Mr. Justice Bruce said he would take time to consider his judgment.

District Surveyors' Fees.—The case of *Corbett* v. *Badger* was heard in the King's Bench Division of the High Court of Justice on May 4th. This was an appeal against an order by Mr. Kennedy, the Metropolitan police magistrate, under the London Building Act of 1894. The appellant was the owner of land known as the St. German's Estate, at Hithergreen, Lewisham, and the respondent was the surveyor of the district. In 1899 the appellant contracted with a builder to erect some houses on a part of the estate, and he erected them. The appellant paid the sums for which the builder contracted to erect the houses, and they included any fees which the builder was liable to pay to the respondent under the Act. The builder, however, soon became insolvent, before the money was paid. Then the respondent took out summonses against the appellant, as the owner, because the statute provides that if the builder is in default with the fees the owner and the occupier shall be liable. The appellant took objection, and the summonses were not issued within six months of the time the complaint arose, and this depended upon a quantity of detailed evidence as to the progress made with the buildings. The magistrate overruled the appellant's contention and ordered him to pay £546 and costs. Hence the present appeal, in the argument of which it was urged that it was a great hardship on the appellant that he should have to pay the money twice over. The Lord Chief Justice said that in his opinion the case was one of considerable difficulty, but he had come to the conclusion that they could not interfere with the decision of the magistrate. Mr. Justice Lawrence concurred, and the appeal was dismissed with costs. Leave to appeal was, however, given.

Electric Light Boxes in Streets are Building Structures.—In the King's Bench Division of the High Court of Justice the case of *The Whitechapel Board of Works* v. *Crow* was recently heard. The case originally came before Mr. Justice Kennedy and Mr. Justice Darling last December, when, the learned judges disagreeing, it was reheard at a specially-constituted Court consisting of Justices Grantham, Kennedy and Darling, judgment being reserved. It was an appeal by the Whitechapel Board of Works from a decision of Mr. Dickinson, the magistrate sitting at the Thames Police Court in June last. It appeared that a summons was taken out by Mr. Crow, surveyor, against the Whitechapel Board of Works for not having given him notice, under Section 145 of the London Building Act, 1894, before commencing the construction of certain boxes or inspection chambers under the streets for the purpose of electric lighting. The Whitechapel Board of Works were the constituted authority under the Electric Lighting Act, 1892, and the Act of 1894 provided for a notice of any works to be carried out being sent to the Postmaster-General and the London County Council, together with plans of the proposed works. That notice was not served upon Mr. Crow, and the Whitechapel Board of Works contended that the Act of 1894 did not apply to boxes constructed in the streets under their Provisional Order, inasmuch as the Order contained a complete code regulating the materials, situation, and mode of construction of such boxes, and provided complete machinery for enforcing such regulations and work, with which special code and machinery the London Building Act of 1894 was incorporated. The learned magistrate found, as a fact, that the boxes were building structures, or works within the meaning of the section of the London Building Act, 1894, and he imposed upon the Whitechapel Board of Works the nominal penalty of 1s., and ordered them to pay £10 10s. costs. From this decision the Whitechapel Board of Works appealed. Mr. Justice Grantham and Mr. Justice Kennedy now gave judgment dismissing the appeal, with costs.

Non-fulfilment of Contract: A Nottingham Arbitration Case.—In the case of *Frederick Ingle*, trading as Dennett & Ingle, plaintiff, and *Starey's Carriage Works and Horse Repository Co., Ltd.*, defendants, Mr. Albert N. Bromley, architect and surveyor, of Nottingham, who was appointed referee in the arbitration, has now made his award. The plaintiff entered into a contract with the defendants to build a new horse repository and carriage works in Parliament Street, Nottingham, for the sum of £9,850; the architects being Messrs. Brewill & Baily, of Nottingham. These works the plaintiff undertook to complete in two separate portions, so that the existing business could be carried on uninterruptedly. He also contracted to complete the whole of the works by September 29th, 1898. Failing to complete by that date, the defendants were to be at liberty to deduct the sum of £25 for each week that the completion should be behind time by way of ascertained damages, and not penalty. It was further provided that the architects should have power to settle as to what extension of time beyond the said date they should consider fair in case the work was delayed by general strikes and lock-outs, or frost preventing the roofing-in of the building, but that these should be the only causes for any extension of time, which might be so settled by the said architects. On November 23rd, 1899, the architects gave their final certificate in respect of the contract for a balance of £867 10s., but the defendants, instead of paying such sum to the plaintiff (according to the plaintiff's contention), deducted therefrom £225 in respect of alleged ascertained damages for delaying completion, and paid only £632 10s., which last-mentioned sum had been received by the plaintiff as a payment on account, and not otherwise, leaving still due to him £225 on the final certificate. This £225 deduction was for nine weeks at £25 per week, dating from February 4th, 1999, the extended time fixed by the architects for the day of completion, to April 9th, when the works were said to be actually completed. The plaintiff contended that it was impossible to complete by the time fixed by the architects; (*a*) because he was unable to obtain sufficient possession of the site; (*b*) that drawings were not supplied to him from the architects in time for him to complete the work; (*c*) that certain sub-contracts, over which he had no control, and which were paid for direct by the proprietors, prevented him from completing the work; and (*d*) that extra time should be allowed for extra works. The plaintiff further claimed the sum of £483 5s. for these reasons, and for other items of loss. The defendants pleaded that the contract contained the following provisions: (1) That the architects' decision on all points in connection with the buildings as regards the time for completion was to be final and binding on all parties to the contract; (2) that the plaintiff was to suspend the execution of the works whenever called upon by the architects to do so on account of inclement weather, or other causes, and the architects should be the sole judges as to what extension of time should be allowed through such suspension of the works. The defendants' also denied the contentions of the plaintiff as to items *a*, *b*, *c* and *d*. The defendants entered a counter-claim for the sum of £650, in case it should be held (contrary to the defendants' intention) that the architects had no jurisdiction to extend and decide on the time for completion. This claim included rent of temporary premises, loss on advertising the opening of the new premises three separate times, and loss of business. The referee has awarded that the sum of £260 10s. shall be paid by the defendants to the plaintiff on the claim, and that the sum of £129 10s. shall be paid by the plaintiff to the defendants on the counter-claim. Each party to pay their own costs.

Unprotected Excavations.—Walter Shaw, builder and contractor, was summoned recently at Sheffield for leaving an excavation insufficiently protected. A blind man fell into a hole at the corner of Thompson Road and Ecclesall Road which had been made by the defendant's workmen. Replying to the defendant, this man admitted that he had several times fallen into excavations made by the Corporation and others. On this occasion, although no limbs were broken, he was very severely shaken. Defendant admitted that his workmen were at fault. The magistrates imposed a fine of 10s., including costs.

Alterations under London Building Act: Council Defeated.—On May 7th Mr. Justice Channell delivered judgment in the case of *The St. James's Hall Co.* v. *The London County Council*, heard in the King's Bench Division of the High Court of Justice. His lordship said the action was to obtain a declaration that a certain notice was *ultra vires* on the true interpretation of the Metropolitan Management and Building Act, which gave to the Metropolitan Board of Works, and now the London County Council, certain powers for the prevention of fire in music-halls. The Metropolitan Board of Works gave notice to the plaintiffs to make structural alterations (Mr. T. Walter L. Emden was their architect). Modifications were agreed upon, and the work was done on August 10th, 1885, the cost of the work being about £7,000. The original order of the Board included the pulling down of an existing staircase and the re-erection of another in the same place. The modification included the pulling down, but agreed that it should not be re-erected, the necessary accommodation required in case of fire being provided elsewhere. One of the arguments of the London County Council was that there was power to give notice "whenever" necessary. He (Mr. Justice Channell) did not regard that as very important, but it was an illustration of the mischief of holding that the powers of the section might be exercised, from time to time, whenever it appeared to the London County Council that there was danger of fire. If that were so, as soon as the owner had completed the work there might come a change of views of the London County Council, and the work might have to be done over again. The plaintiff company had from time to time since 1885 voluntarily made alterations in regard to seats, &c., but had done so without admitting the right of the defendants to require them to do so, and it seemed doubtful whether any of them were structural alterations. The London County Council now required fresh work to be done at a cost estimated at £4,000. On the whole, he came to the conclusion that the plaintiffs were right in their contention; he thought the London County Council had only power to order alterations if such could be carried out at a moderate cost, and if, when done, they would remedy whatever defects existed. He considered that the word "whenever" in the section was fully accounted for. The London County Council were to exercise the power given whenever they chose, but when they did exercise it their decision was final, not only as to the works required but as to those works being sufficient. He therefore thought the London County Council could not serve the second notice in respect of the works they required to be done, and he must give judgment for the plaintiffs with costs. He presumed the declaration would be sufficient. The declaration asked for by the plaintiffs was then made, and the defendants directed to pay the costs.

A Derby Building Dispute.—The case of *Ford & Co.* v. *Bemrose & Sons, Ltd.*, was recently decided in a Divisional Court of the King's Bench Division. The defendants, who are printers of Derby, instructed Mr. Ernest Ridgway, an architect, to prepare plans for the erection of certain works in Park Street, Canal Street and Carrington Street, Derby, and to invite tenders for the erection of the works. Plaintiffs, who are builders at Derby, tendered, and their tender was accepted, and a contract dated May 25th, 1895, was entered into by which the works were to be completed by May 7th, 1896. The total amount of the contract was £10,559. On April 1st, 1897, the architect gave a final certificate certifying that a balance of £1,530 was owing to the plaintiffs from the defendants. Plaintiffs were dissatisfied, and various disputes arose which were eventually referred to arbitration. The arbitrator found that the quantities set forth in the bill of quantities upon which tenders were invited were insufficient, and that the plaintiffs did not verify the quantities, and were not aware that they were deficient, and that they tendered and entered into the contract upon the assumption that the quantities were correct. He found that various alterations and deviations of the work were decided upon during the progress of the work, and the sum of £3,281 ought to be added to the contract price in respect of such alterations and deviations. The total value of the works executed by the plaintiffs was £13,840, and the amount already paid them was £8,750, leaving a balance alleged to be due of £5,090. The questions for the opinion of the Court were whether, in ascertaining the amount to be paid by the defendants to the plaintiffs, regard was to be had to the usage in the building trade, whether the plaintiffs were only entitled to be paid the sum of £10,559 mentioned in the contract, with deductions or additions in respect to alterations or deviations from the original plans determined upon during the progress of the work, or whether the plaintiffs were entitled to be paid the value of all the works actually executed by them at the prices upon which the contract was based. Their Lordships held that the plaintiffs were entitled to the full amount of £5,090, not on the ground of any trade usage or custom, but on the question of breach of contract they thought plaintiffs were entitled to recover in consequence of the incorrectness of the quantities submitted to them. The costs of the special case were to be the plaintiffs', but the costs of the reference were to be dealt with by the arbitrator.

The Naming of Streets.—The case of *Collins* v. *Hornsey Urban District Council* was heard last Wednesday in the King's Bench Division of the High Court of Justice. The appellant, Mr. Collins, appealed against a conviction by the justices of Highgate under the Towns Improvement Clauses Act of 1847. The facts of the case were that the appellant was the owner of a building estate on which was a road which he called Midhurst Avenue. The district council, in regard to the approval of plans, had acquiesced in this name being given to the road, but ultimately a Mr. William Arnold, who owned a residence in the locality, which was approached by an avenue of trees and was called Midhurst, took exception to the name. The district council thereon decided that, instead of being called Midhurst Avenue, the place should be called Collingwood Avenue, but Mr. Collins objected. The council, however, put up a board on which the road was described as Collingwood Avenue. The appellant obliterated that description, and for this he was summoned under the Act above mentioned at the Highgate Petty Sessions and convicted. On his behalf reliance was placed on a case decided in the Irish courts, when the Corporation of Dublin proposed to change the name of Sackville Street to O'Connell Street, in which it was held that the Corporation had not the power to do so, and that even if it had the Court was entitled to restrain it if the action would be injurious to the inhabitants of the street. The Lord Chief Justice said that in his judgment the Dublin case was no authority in the case before them, as very different considerations applied to new streets to those which affected existing streets which had long borne a particular name. In this case, though the name of the street which the owner desired should be adopted had been brought to the knowledge of the local authority, it exercised no jurisdiction in the matter until it *bonâ fide* determined that it should be called "Collingwood Avenue." The appellant had no right to do what he had done, and if he had a right to name the street as he liked he should have endeavoured to enforce it by taking proceedings to restrain the respondents. Mr. Justice Lawrance concurred, and the appeal was dismissed, but without costs.

The Black Smoke Nuisance.—At Westminster Police Court last week three summonses for dense black smoke nuisance were heard against the Queen Anne's Residential Mansions Hotel Co., Ltd., Westminster, under Section 24 of the Public Health (London) Act, 1891. For the defence it was said that during the last ten years eight different kinds of smoke-consuming apparatus had been installed, at a cost of about £3,000. Mr. Glen said that the Mansions' chimney took the place of 300 ordinary kitchen chimneys. Mr. Horace Smith, after a long hearing, said he found, as a matter of fact, that on various occasions black smoke issued from the chimney in question in such quantities as to be a nuisance. He also found, as a fact, that defendants had taken all reasonable means to prevent such nuisance. But these efforts he held to be no defence. As a mixed question of law and fact, he found that the chimney was not that of a private dwelling-house. He inflicted a fine of £5 on the first summons, and 10s. each on the second and third. He also allowed £5 5s. costs.

THE RISE OF EGYPT.

BY PROFESSOR FLINDERS PETRIE.

PROFESSOR FLINDERS PETRIE gave the first of a series of three lectures on "The Rise of Civilisation in Egypt" at the Royal Institution on Saturday last. During the last decade, he observed, the whole aspect of the subject had changed. Until 1892 the whole of Upper Egypt was closed—at least to English work. But after that date at the outset British explorers found traces of Mycenæan civilisation—then remains of the dynastic period; and at last we had come to the period of first and second dynasties. These years had been fruitful of results, covering the years from 4000 B.C. to 7000 B.C., and we might say our knowledge of early history in Egypt was now more exact than that of the first ages of any other country in the world. The range covered the unparalleled period of 9,000 years. In a table on the screen Professor Petrie marked successive periods, giving 5800 B.C. as the date of the highest prehistoric civilisation and 7000 B.C. as the rise of that civilisation. The Pyramid builders were about 3600 B.C. The lecturer showed by example the varieties of form and the growth of art and style in successive epochs. The continuity of historic form was already known, and the presence of an alien form led to a reasonable inference of prehistoric character. In pottery a scale of sequence had been worked out with tolerable exactness during the period hitherto regarded as mythical. Then in slate the growth and improvement, followed by decay in workmanship, were shown by pictures of animals which ultimately became excessively formal and constrained. Except with metal the result attained was that art had reached its acme in prehistoric times and then began to degenerate. Figures of colossal size of human and animal forms, cognate with what had been found in South Africa and elsewhere, were discovered, and a connection might be formed by means of these fragments of stone and others of ivory, between Malta, the South of France and Egypt. The age to which these should be assigned was probably the palæolothic. These figures might be regarded as the last remains of the palæolothic period. In the whole prehistoric period there was no trace of the potter's wheel, and the variations of form were greater than was possible to the wheel-formed work. The lecturer next touched on the marks on the pottery—some clearly connected with those of Crete and Libya, and which formed the basis of various alphabets. These signs were traceable throughout the whole history of the Mediterranean until by the growth of commerce and the need for common action a selection had to be made in the form of an alphabet. Thus the links which bound us with the dim past of Egyptian history were more palpable than was generally believed.

Mr. J. E. Lash, architect, of Wrexham, died last week at the age of fifty-one years.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Charges of Surveyors and Others.

Chippenham—N. N. W. writes: "The Kalendar of the R.I.B.A. contains particulars of architects' charges for various kinds of work, which the Institute sanctions. From what sources can reliable information be obtained as to usual charges for the various kinds of profesional work undertaken by solicitors, surveyors, land, estate and house agents, auctioneers and valuers?"

See Hurst's "Architectural Surveyors' Handbook" (4s. nett.) and Evans's "Solicitors' Remuneration Act, 1881" (price 2s. 6d., Sweet & Maxwell), to be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Liability for Non-Fulfilment of Contract.

Perplexed writes: "A building is erected under the direction of an architect, and the owner employs a clerk of works during the whole time. After about three years some basement floors are taken up, and it is then discovered that only a thickness of 4in. of concrete is laid instead of 6in. as per specification. The owner now calls the attention of the architect and builder to the discrepancy, and declares that he must have the floors taken up and relaid according to specification. This is very unreasonable, as the floors are sound and very good. What are the legal positions of the architect and builder? Are they liable; and how far does the employment of a clerk of works relieve an architect from responsibility?"

It would probably be best to consult a local solicitor, to whom the facts of the case can be explained personally in greater detail. As a general rule, an architect is responsible only for general supervision, and in this instance the owner seems to have specifically acknowledged this by himself appointing the clerk of works instead of leaving the appointment to the architect in the usual course. If anyone is liable for negligence it is the clerk of works; while, if an action were brought by the owner against the builder, he might recover the difference in value between the concrete as laid and that specified. Even this is doubtful, as many judges would hold that the matter was settled when the architect gave his certificate of satisfactory final completion, especially if he was made sole arbiter under the conditions. Had the fault been discovered before this certificate was given, the architect (not the owner) could have ordered the floor to be taken up and relaid of the proper thickness; but unless fraud and collusion between builder and architect can be proved, such a course appears now to be barred. G. A. T. M.

Proportions for Concrete Mantel.

Yorks.—J. T. writes: "What proportions of cement, sand and stone are suitable for making a concrete mantel for a 4ft. opening; size of mantel 5ft. 6in. by 12in. by 8in.?"

The proportions vary according to the class of Portland cement to be used, but for a standard cement use two parts for five parts of aggregate. The aggregate may consist of broken stone, bricks, granite, slag or similar hard materials. Gravel or shingle, being of a smooth and round form, should not be used for this class of work, as they have not the same keying powers as the above-mentioned materials, which are angular and rough when broken. Use neat cement, termed "slip," for the surface coat of the mould, then follow on with the coarse gauge. If the work is done *in situ* use the "slip" for the finishing coat. WILLIAM MILLAR.

Position of Building Surveyor as Architect.

An Old Reader writes: "A building surveyor is an architect practising in one district and resident in a neighbouring town. Is this in accordance with the Local Government by-laws? His salary amounts to £10 a year, and he is a F.R.I.B.A. What is your opinion of this gentleman occupying such a paltry position? Is Is it proper that he should recommend his own plans to be passed by the Board?"

Appointments of this nature are made by the local authority, and are subject to the approval of the Local Government Board, who may interfere if they think the salary excessive or insufficient, the conditions of the appointment unsatisfactory, or the gentleman appointed incompetent. There are many districts where £10 per annum is an adequate salary, there being little or no work to do, and if a competent architect can be persuaded to undertake the duties of the position, it is distinctly to the advantage of the community that he should be allowed to do so, even though it may involve his having occasionally to adjudicate on his own plans. Fortunately architects of position are almost invariably honourable men, so that abuses, though not entirely unknown, very rarely arise in consequence. G. A. T. M.

Concrete Steps.

Sheffield.—F. S. writes: "Please state whether lime, plaster, or cement is best for finishing the backs of concrete stairs. Which is the best way of rendering concrete steps non-slippery? Are there any patent methods employed for this purpose?"

The backs of concrete stairs should be finished with the same materials as used for facing the rough concrete, so that the whole will have a uniform colour and stone-like appearance. For a fine smooth finish, or where the work has to be painted, Portland cement, with the addition of a fifth part of well-matured lime putty, laid and well trowelled, makes sound and satisfactory work. The finishing coat should be laid while the rough concrete is green. Lead, brass, cork, and wood cubes, or studs, embedded in the treads of concrete steps have been the subject of recent patents, but some are similar to previous patents and methods. Merryweather, of fire-engine fame, obtained a patent for the use of lead cubes inserted in concrete to render the saurfce non-slippery; but lead and simliar materials in concrete paving to give a good foothold were used in London about thirty years ago, notably by Allan, who first introduced concrete steps, and also by Lascelles. Indenting by metal or wood stamps, or by brass rollers, or grooving the surface, has only a temporary effect, as continuous or heavy traffic sooner or later effaces the indentations. Another objection is the retention of dust and wet in the indentations. An effectual and novel method of rendering concrete step-treads non-slippery is by the use of rubber plugs in the form of screws, which are inserted at intervals in the concrete surface. By this ingenious method the rubber plugs, after wearing below the surface, can be raised flush with the surface again by simply screwing them up. This process is repeated as required until the plugs are entirely worn away. After this they are speedily and cheaply replaced by screwing in new plugs. The rubber plugs, besides affording a non-slippery tread, also ensure an almost noiseless traffic, and the treads are pleasing in appearance and pleasant to walk upon. Messrs. Burness & Son, plasterers and cementers, Montrose, are the inventors of the rubber screw-plugs. WILLIAM MILLAR.

Sun Prints.

Littlehampton.—Beric writes: "Where can I obtain sensitised paper for photographic sun prints of drawings, &c.; and how is this paper manipulated?"

Paper for sun prints is obtainable at any good dealer in photographic apparatus. All kinds can be purchased from Messrs. Otto König & Co., 27, Cross Street, Finsbury Pavement, E.C.; Mr. A. G. Thornton, 87, St. Mary Street, Manchester; Messrs. J. R. Gotz & Co., 215, Shaftesbury Avenue, W.; or Messrs. Allott, Jones & Co., Bixteth Street, Liverpool. On p. 128 of our issue for March 28th, 1900, we published a review of a book on this subject entitled "Ferric and Heliographic Processes" (Dawbarn & Ward, Ltd., 6, Farringdon Avenue, E.C., price 2s. nett). Some particulars of the different papers and their manipulation are given in this review, but if querist desires full details of the various processes he should obtain the book itself.

Surveyors' Institution Examinations.

Goole.—Surveyor writes: "Kindly give a list of text-books for the P.A.S.I. degree of the Surveyors' Institution (Part III., Building Section) which you would recommend for a student. The Institution syllabus names several, but the difficulty is to select the best for each subject. Would an assistant of several years' service be exempt from the preliminary plans of measured buildings required, and the survey of building plots? If not, would carefully-drawn copies of plans of modern design representing his own *bonâ-fide* design and working-out in the office satisfy the Examiners?"

Usill's "Practical Surveying" (6s.), Middleton's "Surveying and Surveying Instruments" (3s. 9d.), Leaning's "Quantity Surveying" (12s.), Leaning's "Specifications" (18s. nett.), Wright's ' Fixtures" (5s. nett.), Bullen's "Dilapidations" (5s. 6d.). Gale "On Easements," Hudson's "Law of Light and Air," Rivington's "Notes on Building Construction," four vols, Hull's "Building and Ornamental Stones" (7s. 6d. nett.), and Burnell's "Limes, Cements, Mortars, Concretes, Mastics, &c." (1s. 6d.). These can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C. With regard to exemption from any subject, you had better write to the Secretary of the Institution, 12, Great George Street, S.W. The drawings need not be highly finished. Ordinary working drawings are quite suitable.

Powers of District Surveyor.

Salisbury.—J. H. writes: "What are the powers of a rural district surveyor and sanitary inspector? A rural district council has no by-laws to guide anyone, and their surveyor is making himself too important."

The district surveyor has no powers other than those conveyed by the by-laws; he is the servant of the local council, and merely acts for it, which is the final authority upon the matter. It is, however, upon his report that it would decide to prosecute if the by-laws are contravened.

The Use of Tufa in Buildings.

London, S.E.—H. C. S. writes: "I have been informed that the use of 'tufa' in a building denotes that the latter is of great antiquity. Is there any authority for this, and if so what period (approximately) does it denote?"

Tufa, or tuff, is a rock composed of volcanic ashes and sand; thus the words are used as general terms to include all the fine kinds of volcanic detritus, ranging from coarse gravelly deposits to conglomerates, and even to exceedingly compact fine-grained rocks formed of the finest and most impalpable kind of volcanic dust. Some tuffs have been consolidated under water, others on dry land, and, as a rule, are distinctly stratified. Rome is practically built upon tufa rock, which will therefore be found largely used in the buildings of that city. Wherever tufa is obtainable, it is but natural that it should be used for building. The fact of its use therefore is no criterion of the age of the building. It is, however, a feature of Rome and Pompeii that the earlier buildings were more generally of tufa than the later buildings, which fashion and wealth had stipulated should show a fine stone face. Tufa does not, as a rule, weather well, and is therefore stuccoed or faced with stones which do. It should be remembered that in early civilisation the materials close at hand would be used until means of transport were evolved.

Books on Hospitals.

London, S.W.—C. F. H. writes: "What is the latest book on isolation-hospital planning and construction, and where can I obtain it?"

"Hospitals for Infectious Diseases," by Sir Richard Thorne-Thorne (5s. nett), and "Healthy Hospitals," by Sir Douglas Galton (8s. 6d.), are books that will be found useful. They can be obtainable from Mr. B. T Batsford, of 94, High Holborn, W.C. Articles on "Hospitals," by Mr. Frederick Batchelor, appeared in our issues for April 7th and 14th, 1897; "Modern Hospitals," by Mr. William Henman, in our issue for March 21st, 1900; and "The Construction of Hospitals for Consumption and other Infectious Diseases," by Dr. John W. Hayward, in our issues for November 23rd and 30th and December 7th, 1898.

Initials in Door Head.

Burton-on-Trent.—H. R. N. writes: "I enclose photographs (not reproduced) of an old doorway of a house (formerly a hall, but now a farm) near here. Kindly state what the letters are contained in the monogram. I have failed to decipher them."

The initials are B, M, C, D, E, but in what order they should be arranged we cannot tell. A crown surmounts them. We should infer they are connected with the family to whom the house first belonged, and we advise that the date of the house be obtained and the records searched for some name or names corresponding to the above initials.

Apportioned Cost of Repairs to Adjoining Drains.

London, S.E.—A. H. writes: "The drain in the next house to mine has been condemned by the sanitary inspector, and the owner is ordered (magistrate's order) to take up and relay it. My house drain runs into this drain. My next-door neighbour says that the alteration of his drain will cost him £18, and that I am liable for half of this sum, because my drain runs into his. I am under the impression that I have to pay for all alterations to drains on my premises, and that he has to pay for alterations to drains on his premises, although my drains run into his. Is this so?"

If the drain in question is a "combined private drain," and not a "sewer" vested in the local sanitary authority, then the cost of reconstructing or repairing the combined drain should be kept quite distinct from other work, and divided equally between the owners of the two houses draining into it. Each house-owner should, however, bear the cost of reconstructing or repairing their own branch drains from their respective houses to the junction with the combined drain. T. E. C.

Fall for Drains.

Bolton.—J. T. writes: "Kindly state the smallest falls for drain pipes of 4in., 6in. and 9in. diameter. Mr. Baldwin Latham gives the minimum inclination for a 4in. drain pipe as 1 in 92; 6in., 1 in 106; and 9in., 1 in 206. Would this be of use to refer to for house drainage?"

The inclinations should never be less than 1 in 62 for a circular pipe 4in. in diameter, 1 in 107 for a 6in. pipe, or 1 in 183 for a 9in. pipe, but greater falls than those given are advisable for ordinary house drainage—say, 1 in 30 to 1 in 40 for a 4in., 1 in 40 to 1 in 50 for a 6in, and 1 in 60 for a 9in. There should be some means of flushing the drains where the fall is less than these latter, either by a small flushing-tank or a quickly-discharging bath.

Material for Forming Ceiling.

Brighton.—Roof writes: "It is proposed to turn the waste space under the roof of a house into a large room, and for this purpose it is necessary to line the underside of the rafters with some suitable inexpensive material that shall be fire-resisting, vermin-proof and warm. Lathing and plastering is objected to, as the house is occupied and plastering work causes excessive dust and dirt. Compo-board and Willesden paper are also objected to, as neither quite fulfil the requirements. Asbestos slate would be too expensive. The rafters and collars are the usual 12in. apart."

We would suggest the use of fibrous-plaster slabs, which are cheap, easily fixed, and, when stopped, can be papered; or slabs with finished faces can be obtained, and when stopped are equal to an ordinary plastered surface. If these are objected to, you might use "Uralite," a fireproof and non-conducting material in thin sheets, or "Salamander" fireproof ceiling decorations in relief. Particulars of these latter materials can be obtained from The British Uralite Co., Ltd., at 37, Lombard Street, E.C., and the Wall-Paper Manufacturers, Ltd., 158 & 160 Charing Cross Road, W.C., respectively.

Sewer Pipes.

Yeovil.—R. S. K. writes: "What is the best material for sewage pipes of 30in. diameter? Why are not such large pipes made in ordinary stoneware? What is nalethric stoneware; and does this latter make a good sound pipe for the above purpose?"

Concrete pipes have been largely used when required of large size. Ordinary stoneware pipes are liable to crack and warp in the firing, and would be extremely difficult to make to this size. "Nalethric" stoneware is made from a special heavy fireclay worked by Messrs. Oates & Green, of Halifax; extremely good sanitary tubes are made by them of this ware.

Sewage Treatment.

Wellington.—Outfall writes: "I should be glad to know where the bacterial treatment of sewage is carried out on the following lines: With two series of beds, the first filled with rough material with upward continuous flow and having a rest of a week or so, say, once a month; the other filled with fine material having downward flow and the usual times for filling, standing full, emptying, and resting, as adopted by Mr. Dibdin. There would be a sedimentation tank, holding at least one day's flow before entering the beds."

We do not know that the system referred to is worked anywhere, but in all probability it has been tried. The nearest approach to it is the Scott-Moncrieff system, in which the sewage passes up through a false bottom, rises between successive strata of flint, coke and gravel, and flows at its original level (or thereabouts) on to a thin layer of filtering material on a tray, then falls a few inches and encounters similar layers. This system is adopted at Caterham and works very satisfactorily. The short paper on the bacterial treatment of sewage in our issue for February 21st, 1900, summarises the system. If you construct beds on the system proposed we should certainly advise a sedimentation tank. The beds if worked with a sedimentation tank would not require a rest so often as once a month.

Laying of Purlins on Rafters.

Portmadoc.—Student writes: "Kindly explain which to notch in laying purlins on principal rafters, and give the reason for notching one more than the other. What is your opinion of Burrell's Building Construction (Elementary Course)?"

The purlins are always notched, and not the principal rafters. The reason for this is to keep the principals firm, and although it is of course possible to devise some other method of fixing them it would be of no particular advantage, and would be likely to weaken them more than the usual method. To notch the principals would be distinctly unscientific and to no purpose, as they would then be free to overturn. There is also the question of economy to be considered; small timbers are more abundant and more easily obtained than large ones, and therefore it is preferable to increase the size of the purlins to allow for the weakening by the cutting than to increase the size of the principal rafters for that purpose. Burrell's Building Construction is a useful little book to use to study in preparation for the South Kensington Examinations, but of course is not so useful a guide to practical work as the larger works.

Books on Timber.

V. W. sends the following further reply to the query of "Renuad d'Est" (see p. 244 of our issue for May 1st last): "Wood and its Use as a Constructive Material,' by W. Stevenson (published by Mr. B. T. Batsford, 94, High Holborn), is a most excellent work, full of most valuable information. The author is a timber merchant, of Hull and Scarborough, a traveller in the chief wood-growing countries, and one who takes an enthusiastic interest in the material he deals in beyond its mere buying and selling. He is a frequent contributor to the timber trade journals and the architectural periodicals."

R.I.B.A Examinations.

Aberavon.—Libro writes: "I am desirous of entering for the R.I.B.A. examinations. I have passed the London Matriculation in the first division, and hold the senior certificate of the Central Welsh Board. In addition to this I have certificates (elementary) in the Science and Art Department for model drawing, freehand drawing and geometrical drawing. Do these give me full exemption from the first examination, and if so how can I get a certificate to prove this when I take the next examination?"

The London Matriculation exempts you from examination in Subjects 1, 2, 3, 4, 5 and 7 in the R.I.B.A. Preliminary, but to be exempted in Subject 6 you need to hold first-class certificates in the elementary Science and Art Examinations in both Geometrical Drawing, Subject 1*a*, and Perspective, Subject 1*c*), and to be exempted from Subject 8 you need to hold a first-class certificate in the advanced stage Science and Art Examination for outline drawing of ornament from the cast (Subject 3*b*). Full particulars can be obtained from the Secretary, R.I.B.A., 9, Conduit Street, Hanover Square, W.

Halifax.—F. O. writes: "Kindly give me a list of text-books (exclusive of larger reference books) which one should obtain for preparation for the R.I.B.A. Intermediate examination."

A list of suitable books is to be found in the R.I.B.A. Kalendar, obtainable from the Secretary, 9, Conduit Street, W., price 2s. 6d.

Cracked Plasterwork.

Preston.—Ribble writes: "The flue from the heating apparatus of a chapel passes through the vestry. The flue is of 4½in. brickwork, plastered and painted. The plaster is full of unsightly cracks, due, I suppose, to the heat of the flue. Do you know of any cure for these cracks?"

The plastering has in all probability been badly done, either as regards materials or workmanship, or both, although the heat of the flue would also have something to do with the cracks. Cracks may be ascribed to any one or several of the following causes: too quick drying, considerable variations in temperature just after the plaster is put on, the laying of one coat of mortar on another, too strong a suction of the backing due to dryness, thus absorbing all the moisture from the plaster and causing it to shrink and become crumbly; use of bad materials, and bad workmanship. The brickwork of the flue is also not thick enough; for if the heat is considerable the bricks will expand, and this with the subsequent contraction is productive of cracks. Plaster and sand resists heat well. There would appear to be no adequate cure if the heat is great, except to build a new flue and replaster.

Sand for Plastering.

Mansfield.—En Avant writes: "Which is the best sand to use for coloured setting for internal plastering; also for Portland cement for exterior work?"

A good gritty silicious sand should be used, free from loam or muddy particles, as these are detrimental to the setting. Obtain samples of the sands you have handy, and shake them up with water. If the water is much discoloured after the vessel has been kept still for several seconds, the sand is not suitable. Silver sand being fine grained gives a good internal finish, but the calcareous kinds are bad. For external work a larger grained sand can be used.

Sewer.

Taunton.—One in Doubt writes: "Would a circular brick sewer 24in. diameter, 6,500ft. in length, having a total fall of 15ft., or 1 in 433·33, with a minimum flow of 180 gals. per minute, be self-cleansing, and if so what would be the velocity? Also what would be the least safe fall for the efficient working of such a sewer? Is the same velocity maintained with the same rate of fall, no matter what the length?"

The sewer would not be perfectly self-cleansing, but would require, as most sewers do, to be periodically flushed in parts. The velocity with the minimum flow of 180 gals. would be about 1·8ft. per second, and when full about 2·88ft. per second. The discharge running full would be about 4,000 gals. per minute. Sewers, to be self-cleansing, should have a mean velocity of flow of not less than, 2½ft. per second; however, the velocity need not be so high to be quite efficient enough, but the velocity should never be less than 1ft. per second at any time nor more than 4½ft. per second; beyond the latter the bed would be worn away. The least fall advisable for the sewer mentioned would be 1 in 577.

Our New Insurance Schemes are summarised on page 290 of this issue.

Keystones.

A Swimming-Bath for Women.—The Local Government Board has sanctioned the borrowing by the Reading Town Council of £4,500 for the erection of a ladies' swimming-bath.

County Offices at Newport, Mon.—A Local Government Board enquiry was held recently into an application by the Monmouthshire County Council for permission to borrow the sum of £10,000 for the purpose of providing a council chamber and extending the county offices at Pentonville, Newport.

The Wagner Theatre at Munich.—The new Prince Regent Theatre, or Richard Wagner festival playhouse, in Munich, is now rapidly advancing towards completion. It is being erected on the banks of the River Isar, not far from the spot where King Louis II. of Bavaria intended to build a Wagner theatre. The stage is to be built according to Wagner's ideas of theatre construction, and the scenic arrangements will, it is said, be in advance of anything yet attempted. The auditorium will be in amphitheatre form.

Mr. R. Ll. Jones, Architect and Surveyor, of Carnarvon, died recently at the age of fifty-three years. Deceased served the early years of his career with Mr. R. J. Davids, C.E., who, among other things, carried out the water supply scheme of the town. Subsequently, for a period of twenty-five years Mr. Jones filled the appointment of surveyor to the Carnarvon Corporation. Resigning this, he became a member of that body, but afterwards took up the surveyorship a second time. He retired again some four years ago.

The Foundation Stone of the New Cathedral at Brisbane will be laid by the Duke of Cornwall and York on May 22nd. The site of the building is described as excellent. The desings were drawn up by the late Mr. J. L. Pearson, R.A., and will be carried out by Mr. F. L. Pearson, in conjunction with Mr. W. D. Caröe. The complete design, of which the probable cost would be £100,000, and which would provide 3,000 sittings, will not be carried out at present, for want of funds, but it is proposed to begin with the choir and transepts, to accommodate 1,200 worshippers. This will cost £35,000.

A New Baptist Church at Haslingden, Lancs., has just been opened in Bury Road. It accommodates on the ground floor 328 persons, in the galleries 279, and in the choir 20—total 627, or a mixed congregation of over 700 persons. There are four vestries attached, and also a choir vestry adjoining the organ chamber, which is in the form of a semicircular apse, with the choir in front of the organ and behind the pulpit. The seating is varnished pitch-pine. The gallery fronts are of pitch-pine with carved oak panels, and the pulpit of oak with carved panels. The ceiling is of plaster, curved in the centre, with open timber trusses. The ventilation and heating are on the most approved principles. The walls are of rock-faced stone, with Ashlar stone dressings. The cost has been over £5,250. The architects are Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, 5, Clement's Inn, London. The schools adjoining were erected previously from plans by the same architects.

Worcester Victoria Institute has had a marked success in the recent examinations in building construction at South Kensington, four of its students having gained first classes in Honours, only ten candidates from all parts of the kingdom being placed in the first class. These four students passed through Honours, Part I., during the Session 1898–9, and continued Part II. last year with the success mentioned, thus covering the two stages successfully in two consecutive years' work; they were also the full complement of the class in these stages during the two sessions. Mr. Alfred G. Parker, the youngest of the ten referred to above, was first in order of merit in the whole of the kingdom. Mr. Edward Higgs was fourth, Mr. William J. M. Thomasson sixth, and Mr. J. Pitcher bracketed seventh. The two last-named were, except Mr. Parker, the only students of the ten under twenty-one years old at the time of the examination. The result reflects the highest credit on the students and their instructor in this subject, Mr. Joseph Mottram, himself a First Honours Medallist.

A New Mission Church, in East Twickenham, is to be built on some land to the north of St. Margaret's Railway Station, in connection with the parish of St. Stephen's.

The Max Müller Memorial is to take the form of (*a*) a bust, relief, or portrait in the Bodleian Library, and (*b*) a fund to be called the "Max Müller Memorial Fund," which may be held by Oxford University in trust for the promotion of learning and research in all matters relating to the history and archæology, the languages, literatures and religions of ancient India.

The Royal Institute of Architects of Ireland held a meeting on May 2nd, when the following resolution, proposed by Mr. J. J. O'Callaghan and seconded by Mr. F. Franklin, was carried unanimously: "That the draft by-laws of the Ulster Society of Architects be approved of, and that the Council of this Institute be authorised to make the necessary alterations in the by-laws of the Institute to make them conform with those of the Ulster Society." The following candidates for membership were declared duly elected—Messrs. William A. Scott, London; Jerome O'Connell, Curragh Camp; Henry Seaver, Belfast; and Anthony Thomas Jackson, Belfast.

A New Parish Church at Insch is being erected on the south side of the Western Road, almost immediately opposite the church. It is being built of granite, with freestone dressings. The gable will abut on the street. The main entrance will be sheltered by a porch, and will lead into the hall, which measures 26ft. by 40ft. Behind this hall there will be a guild room 15ft. by 21ft., a classroom 14½ft. by 8ft., a kitchen, and other conveniences. The estimated cost of the undertaking is £592, without the surrounding walls and furnishings. The architects are Messrs. James Duncan & Son, Turriff; and the contractors Mr. F. Manson, builder, Insch: Mr. Thomas G. Archibald, carpenter, Huntly; Messrs. William Milne & Son, slaters, Huntly; Messrs. Seivwright, plasterers, Inverurie; Mr. Robert Douglas, plumber, Huntly; and Messrs. Sutherland & Son, painters, Inverurie.

New Bank Premises, at Littlehampton, are being erected for the Capital and Counties Bank in the Beach Road. A stone porch looking west, and facing the High Street, forms the entrance. The building will be of red brick relieved on the ground floor with stone for the porch and bays. On the first floor the facings will be picked out with stock filling and red brick quoins, while the roof will be of green slates; the eaves being of wood, painted white, and surmounted by two pediments, with carved coats of arms. The inside accommodation should be ample for all local calls, the general office and public space measuring 31ft. 6in. by 23ft. 3in., and having at the rear a two-storey strong room fitted with lift. The estimated cost is between £4,000 and £5,000, and the work is being carried out by Messrs. James Linfield & Son, builders, of Littlehampton; Mr. G. H. Hunt, F.R.I.B.A., of Bedford Row, London, W.C., being the architect.

St. Matthew's Established Church, Morningside, Edinburgh, has been extended by the addition of a chancel. A memorial stained-glass window has also been added. The scheme for the provision of a chancel and an organ has cost £2,236. The chancel is of rectangular shape, externally simple in design and in harmony with the rest of the building. The roof is vaulted in timber, the walls panelled in oak, and the floor laid with richly-coloured marble. In the east gable is the window of four lancet lights, comprised within a moulded pointed arch, the upper part of which is treated with cusp vesica and quatrefoil openings. The figures and scenes, with one exception, were designed by Sir Edward Burne-Jones, and the work was executed by Messrs. Morris & Co., of Merton Abbey, Surrey. The vesica in the upper portion of the window shows our Lord in Glory, with hand upraised in benediction. Two small medallions contain a representation of works of Mercy. In the principal lights are portrayed the four Evangelists with their respective emblems—the winged man or angel being attached to St. Matthew, the lion to St. Mark, the ox to St. Luke, and the eagle to St. John. Below the figures of the Evangelists are depicted four scenes more or less characteristic of each Gospel.

New Council Chambers and Fire Station at Burton Latimer have been opened. Mr. J. Boardman was the architect.

Public Baths for Elland are being erected at a cost of £6,000 on South House Estate, adjoining the District Council Offices. The baths are to be Elland's memorial to the late Queen Victoria's Diamond Jubilee.

A Memorial to the Author of "Lorna Doone" is to be erected in Exeter Cathedral, and Mr. Harry Hems, of Exeter, has, at the suggestion of Mr. Blackmore's representatives, been selected to carry out the work.

Home Arts and Industries.—The Queen has graciously signified the continuance of Her Majesty's patronage to the Annual Exhibition of the Home Arts and Industries Association at the Royal Albert Hall. The exhibition will open on Thursday next.

A New Town Hall at Paddington is proposed to be erected to comprise municipal offices and halls for public entertainments, on the site of the existing inadequate Paddington Town Hall, Harrow Road, and land adjoining. Designs for the new building are to be invited.

Proposed Baths at Swinton.—A Local Government Board enquiry was held recently into an application of the local authority for sanction to borrow £6,880 for the erection of public baths and the purchase of land; £5,062 for private street improvements, and £4,247 for pleasure grounds and public walks at Newton, the amount asked for altogether being a little over £16,000.

A Monument to Mr. G. W. Johnstone, R.S.A., the landscape painter, is proposed to be erected in Morningside Cemetery, Edinburgh, where he is buried. The committee includes Messrs. Hippolyte J. Blanc, Robert Gibb, W. D. Mackay and J. Lawton Wingate, all Scottish Academicians, and the secretary is Mr. J. C. Strettell Miller, W.S., 38, Greenhill Gardens, Edinburgh.

The Agitation about the Decoration of St. Paul's is on the eve of breaking out afresh. Sir William Richmond has completed for the Whispering Gallery a design which will gradually extend itself over the dome. Various architects are stated to have approached Sir William in the friendliest way asking if they may look and speak. In one case he seemed to half promise a consultation, which has, however, never come off.

Masters and Men.

The Swansea Painters, Masons and Labourers have struck for a ½d. increase of wages and alterations of working rules.

The Merthyr Tydfil Stonemasons have struck for an advance from 8d. to 8½d. per hour and a new code of rules.

The Tyldesley House and Ship Painters' Society has secured for its members a rise in wages of ½d. per hour.

A Strike at Bolton has occurred of the plumbers, slaters and slaters' labourers for an advance in wages and an alteration of winter hours. About 300 are idle.

The Plasterers' Strike at Barnsley for an advance of wages to make the pay 9d. per hour, and for alterations in the working rules, has been settled, the men being accorded the advance they asked for, and their working hours reduced to 49½ per week.

A Strike at Leigh and Atherton has occurred of about one hundred men employed in the building trade for a wages advance and improved conditions of labour. The plasterers ask for an advance of from 9d. to 10d. per hour and alterations of working rules, and the painters desire an increase of from 8d. to 8½d. per hour and similar alterations of rule. About seventy men are affected.

The Gosport Bricklayers and Labourers have been granted an increase in wages. The wages for fully qualified workmen will be 8½d. per hour, and for labourers 5½d. per hour. The general working conditions will be the same as heretofore. This means that only bricklayers who know their work will be in a position to claim the additional halfpenny, and that the less skilled men with the trowel will have to carry on under the old conditions.

New Patents.

These patents are open to opposition until June 17th.

1900.—Concrete Piles.—4,548. G. L. MOUCHEL, 124, Holborn, London, W.C. This invention relates to hollow concrete piles. To prevent buckling, a series of struts and diaphragms are arranged internally. The head of the pile is made solid with concrete alone, or in combination with metal. The chief advantages of the invention are that the metal skeleton is completely wrapped in concrete, and so preserved, and the pile is more cheaply made than one wholly of metal.

Concrete Floors, &c. — 9.808. L. DE VALLIÈRE, Lausanne, Switzerland. Round iron bars are combined with flattened coils of wire having the lower portion of their windings passing underneath the bars, the upper portion being buried in that portion of the concrete which is subjected to compression.

Imitation Marble. — 15,830. J. TUCKWELL, 180A, Hope Street, Glasgow. To a mixture of one part each of Keen's marble cement and fine white silver-sand is added ground alum in the proportion of about 1 part to 200 parts of the mixture. Sufficient water is used to form a paste, which is then moulded as desired. The surface may be coated with enamel or painted and then stoved, being afterwards polished, first with rotten-stone and water, and then with a composition of beeswax, turpentine and precipitated chalk.

Wooden Planks.—19,901. J. RATCLIFFE, 181, Denton Lane, Hollinwood, Oldham. Instead of discarding planks because of knots in them, these latter are removed, a true hole is bored and then filled with a screwed wooden plug, which is planed level with the surface.

Parquet Floors.—21,950. F. BOSSHARDT, 4, Corporation Street, Manchester (communicated by the *Société Anonyme Parqueterie Franco-Hongroise*, of Jumet, Belgium). The floor consists of strips of wood (preferably oak) laid on a basis of cement of the same thickness as the strips. Dovetail projections are provided to secure a firm hold.

Flat Roofs.—22.823. H. R. VAUGHAN, Ash Grove, Stranmills Road, Belfast, and the PATENT VULCANITE ROOFING & ASPHALT CO., LTD., Laganvale, Belfast. Wood trellis girders are constructed with double lower chord-pieces and bow-shaped ribs enclosing wood trellises, forming struts, which are continued above the bows to a double upper chord. On top are joists and boarding covered with impregnated felt fastened with "Vulcanite" composition, a covering of sand and gravel being also provided. Unobstructed space from floor to roof is thus obtained.

The following specifications were published on Saturday last, and are open to opposition until June 24th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—5,791, HOW & KING, fasteners for fanlights and ventilating hoppers. 7,219, BALDRY, devices for rendering cranes applicable as excavators. 7,751, SEAGRAVE, apparatus for generating acetylene gas. 7,859, JOHNSON (*Compagnie Francaise de l'Acetyléne Dissous*), means for generating acetylene gas and for lighting by such gas. 7,884, PULLON (partly by *Van Blarcon*), filter applicable for use in sewage treatment. 8,548, RYDILL, couplings or unions for taps, pipes, &c. 8,820, BLUNDSTONE, method of producing white lead. 8,849, THURMAN & SMITH, pulleys and pulley stiles for windows. 9,063, NIXON, screw-down taps and valves. 9,854, WOLFF, foot bridges. 9,870, SWAIT, covers for street gulleys, &c. 10,680, SWIERS, means for automatically fastening gates 10,865, SOHEGÉ, composition for tiles, roofing, &c. 10,895, EWING, joints of stoneware and other pipes. 10,900, HOWARD (*Cormack*), air coolers and refrigerators. 10,952, ALLEY, stop valves. 10,975, MILNES, steps or treads. 11,048, GRISSON, hoists, winches, &c. 11,084, TWYFORD, urinals. 11,087, TWYFORD, fittings for surgical and other sinks, water-closets, &c. 11,146, TWYFORD, cantilever and other brackets for supporting flushing cisterns, lavatories, &c. 11,542, KEAY, pavement lights. 12,176, BRODIE & PRIOR, fire-grates. 12,307, BERESFORD, water-closets for railway carriages. 12,340, REBOUL, smoke-consuming apparatus. 18,903, TATTERSALL, emery-grinding machines. 19,288, GREEN, portable apparatus for hoisting heavy lamp columns, pillars, &c., into place.

1901.—1,479, LAKE (*D. Wachtel & Co.*), production of slaked lime. 3,186, TUCKER & WHITE, apparatus for testing house drains. 3,282, BROMHEAD (*Möller & Pfeiffer*), manufacture of solid blocks of cement out of cement slush. 3,290, HARCOURT, indicator latch for closet doors. 4,954, COOK & HEUSNER, acetylene-gas machines and regulators. 5,346, LATHBURY & SPACKMAN, apparatus for calcining cement. 5,373, ADAMS, siphon cisterns.

BAWTRY CHURCH.

THE reopening of Bawtry Parish Church after restoration took place recently. The restoration has been carried out under the superintendence of Mr. Hodgson Fowler, F.S.A., of Durham, at a cost of £2,800. The extensive alterations include the cleaning of the beams of the nave and the chancel roof, and panelling under the rafters; renewing the aisles, roofs, and externally recasting the old lead and relaying it; the insertion of five clerestory windows on the north wall, both for the sake of light and ventilation; cleaning all the dressed stonework of the walls from colour wash, and re-plastering them, taking up the floors and laying a 6in. bed of concrete under solid wood floors. The old high pews have been entirely removed from the body of the church, and have been utilised as panelling in the vestry; the pews are replaced with open deal seats, which have been polished a dark green; oak seats and other fittings of oak have been supplied for the chancel. Other alterations and renovations include trenching the building outside as a preventative against further damp, the removal of the organ—which has been thoroughly cleaned and repaired—a few feet, thus providing a vestry, replacing the present staircase to the ringing chamber by a new one, removal of the gallery from the west arch, and providing a new heating apparatus. A new lighting arrangement has also been carried out. It is desired to have a screen for the separation of the chancel from the nave, and also screens for the aisles, but these matters have been deferred for the present owing to want of funds. The repairing of the chancel has been undertaken by the Master and Fellows of Trinity College, Cambridge, the patrons of the living.

REALITY IN RELIGIOUS ART.

THE half-yearly general meeting of the Church Crafts League was held last week at the Vale Studio, Chelsea (kindly lent for the occasion by Mr. T. Stirling-Lee), the Bishop of Rochester being in the chair when a discussion took place on the subject of "The importance of Reality in Art and Religion." Canon Scott Holland, the first speaker, said that it was important to remember that individuality in art was not, a mere eccentric detachment from the spirit of the time, but was the embodiment of the feeling of the great corporate body. In the matter of church music much had been said by expert musicians as to the folly of having a precentor to direct the music in churches where the organist was a competent artist. But it was not as if the art was standing alone. It was called in to *assist* the worshippers, and therefore the precentor was for the time being the expert. The same principle applied to all other branches of Art, and it was just this that distinguished religious art from secular. Mr. Henry Holiday dealt at length with the conditions under which the modern journeyman had to live and work. It was impossible, he said, for a man to take any intelligent interest in, or to put his heart into, his work now, because the conditions of modern commercial life had converted him into a mere machine. Rev. Percy Dearmer said that when one looked at the homes of the people, one saw an utter absence of beauty—everything was shoddy and cheap. When one looked at the churches, one found much the same thing. Most of the fittings were made to look as if they had cost twice their real price. There was an entire absence of that reserve which goes so far towards making a thing beautiful. If the decorations of a church were so vulgar and bad that one's nerves were so affected that it was impossible to worship, one was considered affected if one said so. But if the music at a church was noisy and vulgar and in bad taste, one was considered to have a very plausible reason for staying away. Mr. Halsey Ricardo said that art was a man's message to his fellow-men. Every artist had to learn all that his predecessors had learnt, and then go on beyond them. Thus Mozart in one age learnt all that could then be learned about music, and built up his own work on that. Beethoven in another age had gone beyond all his predecessors, and, still later, Wagner had done the same. Miss Lowndes, Mr. T. Stirling Lee and the Rev. A. W. Hutton also spoke. In summing up, the Bishop of Rochester warned his hearers against the danger of hopelessness in thinking of the Church's attitude to art.

Builders' Notes.

Mr. James M'Kenzie, joiner and builder, of Longside Village, Aberdeen, died recently at the age of seventy-eight years.

Mr. Thomas John Penton, of Conheath, Richmond Park, Bournemouth, died recently at the age of fifty-one years. Deceased was a member of the firm of Bath and Penton, builders and contractors, of Bournemouth.

Ex-Bailie Jaffrey, of Johnstone, died recently at the age of fifty-three years of age. Deceased was the senior partner of William Jaffrey & Sons, builders, and was connected with the erection of many of the prominent buildings in the town and district.

British Fire Prevention Committee.—Owing to the serious indisposition of Edwin O. Sachs, chairman of the committee, the formal opening of the new testing station at Westbourne Park will be postponed to the end of the month; but the first private test took place last week under the direction of Mr. Ellis Marsland.

London County Council.—At last week's meeting the annual estimates for the ensuing financial year were discussed. Last year an expenditure of £3,996,737, was estimated for, while the actual expenditure was £3,927,352, or £69,385 less than the estimate. For 1901–2 they estimated for a total expenditure of £4,215,395, and a revenue of £4,168,771. In 1889 the Council inherited from the Metropolitan Board of Works a debt of £28,373,729, although certain assets taken over reduced the nett debt to £16,867,909. To this needs to be added debts taken over from Middlesex, Kent and Surrey, so that the Council commenced its career twelve years ago with a nett debt of £17,563,262. During these twelve years they have provided a sinking fund of £7,257,616. On the other hand, they have considerably increased the indebtedness by the issue of stock to defray their own expenditure on street improvements, new drainage, fire brigade, housing schemes, tramways, and other permanent works, and for the purpose of lending money to other local bodies. The nett debt on March 31st was £24,813,694, an increase of £7,250,432. Of this £2,491,520 represents debt incurred on tramways and working-class dwellings, which involved no charge on the rates whatever. Therefore the additional dead-weight of debt incurred by the Council during its administration was £4,758,912. Against that increase, however, is to be set the growth of the ratable value of London, £8,192,000.

A Keighley Competition.—Mr. Leonard Stokes, F.R.I.B.A., has been appointed to adjudicate the 146 designs received by the Keighley Corporation for the proposed free library. The total value of the plans probably amounts to about £5,000.

Surveying and Sanitary Notes.

Messrs. J. M. Klenck & Co., auctioneers, surveyors, valuers, &c., owing to the increase of their business, have removed from 64, Bishopsgate Street Within, E.C., to more suitable offices at No. 72 in the same street.

Paving at Dewsbury.—The Local Government Board have sanctioned power to the Corporation to borrow £4,733 for granite paving of Huddersfield Road and Thornhill Road, Dewsbury; £417 having been deducted in respect of value of outstanding loan in respect of Huddersfield Road.

Lowe's Patent Sanitary Pipe Joint Syndicate, Ltd., of Dashwood House, New Broad Street, E.C., have recently effected an arrangement with Messrs. J. Stiff & Sons, of Lambeth, whereby this well-known firm become their sole agents for London and suburbs. The advantages claimed for this system of drain pipe jointing are that a perfect and reliable water-tight joint is formed as soon as it is made; that a number of pipes can be jointed on the surface of the ground before laying them in the trenches; that the elasticity of the joints gives absolute security against the escape of sewer gas from the joints, which so frequently occurs with other systems of drain pipe jointing; and that the pipes being socketless lie more evenly when laid.

Engineering Notes.

The Thornhill District Hospital, Dumfriesshire, is being warmed and ventilated by means of Shorland's patent Manchester stoves, patent exhaust roof ventilators and special inlet tubes, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

Southport's Water Supply.—The Earl of Jersey's Committee in the House of Lords has passed the preamble of the Bill, promoted by the Corporation of Southport, the Birkdale Rural District Council and the West Lancashire District Council, to authorise the formation of a Joint board representing the three local authorities, and the purchase by such board of the undertaking of the Southport Waterworks Company, which has a capital of no less than £425,000. The Bill was strongly supported locally, its only opponent being the Waterworks Company itself.

The Cause of Tube Vibration.—Lord Rayleigh's Vibration Committee on Underground Railways, in their report to the Joint Parliamentary Committee on Underground Railways, declare that they have satisfied themselves by personal inspection of the fact that "there is serious vibration to be felt in many of the houses situated along the course of the Central London Railway." Observations made by means of self-recording instruments trace the vibration mainly to two causes—the large proportion of the weight of the electric locomotive not borne by springs, and want of rigidity in the rail. The Central London Railway Company has ordered a new type of locomotive from America, and when it has been tried the Committee will report further; but they believe that "on new tubular railways under proper conditions no objectionable amount of vibration need be apprehended."

The Iron and Steel Institute held its annual meeting last week at the Institution of Civil Engineers. The Report of the Council, which was presented, gave the number of members on the roll of the Institute at the end of the year as 1,644. The income for the year was £4,157, and the expenditure £3,771. The officers and council for the year having been appointed, the president-elect, Mr. William Whitwell, delivered his presidential address, in which, glancing at the progress of the past century, he dwelt on the value of research. As to the value of research in the solution of metallurgical problems, and the improvements of our methods of manufacture, there could be no question. In the progress of the past century, certain achievements stood out more prominently than others. Two of the most important were the reduction of waste and the utilisation of waste by products in all manufactures. Though we had advanced so greatly, there were still many problems in our iron and steel industries awaiting solution. In conclusion, Mr. Whitwell touched upon technical education, and asked the question: Were we using that education to the best advantage in our industries, or letting much of it go to waste and the mental abilities of our workers to rust? That was a matter our manufacturers must look to, and make sure that the education given to our workers was not lost or only indifferently used.

CURRENT PRICES.

		£	s.	d.	£	s.	d.
FORAGE.							
Hay, best	per load	4	7	0	4	15	0
Sainfoin mixture ..	do.	3	15	0	4	12	6
Clover, best	do.	4	5	0	5	2	6
Beans	per qr.	1	7	6		—	
Straw	per load	1	8	0	1	16	0
OILS AND PAINTS.							
Castor Oil, French ..	per cwt.	1	2	2	1	12	1
Colza Oil, English ..	do.	1	1	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	4	9		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels ..	do.	1	12	6		—	
Petroleum, American ..	per gal.	0	0	6¼	0	0	6½
Do. Russian ..	do.	0	0	5¾	0	0	5⅞
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	2	18	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	5	0	1	5	6
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	1	6	9		—	
METALS.							
Copper, sheet, strong ..	per ton	85	0	0		—	
Iron, Staffs., bar ..	do.	6	5	0	8	10	0
Do. Galvanised Corrugated sheet ..	do.	11	0	0		—	
Lead, pig, Spanish ..	per ton	12	6	3	12	15	0
Do. do. English common brands	do.	12	17	6		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do. floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	0	0	6	5	0
Do. Mild Bars	do.	7	0	0	7	10	0
Tin, Foreign	do.	120	5	0	120	15	0
Do. English ingots ..	do.	123	10	0		—	
Zinc, sheets, Silesian ..	do.	21	0	0		—	
Do. do. Vieille Montaigne	do.	21	10	0		—	
Do. Spelter	do.	17	2	6	17	12	6
TIMBER.							
SOFT WOODS.							
Fir, Dantzic and Memel ..	per load	3	0	0	4	0	0
Pine, Quebec Yellow ..	do.	4	7	6	6	0	0
Do. Pitch	do.	2	9	0	3	0	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	0
Do. Petersburg ..	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P.Std.	9	5	0	12	10	0
Do. do. 4th & 3rd	do.	11	15	0	13	5	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	21	0	0		—	
Do. do. 2nd ,,	do.	19	0	0		—	
Do. do. unsorted	do.	12	15	0		—	
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	9	15	0	11	0	0
Do. White Sea ..	do.	9	15	0	13	0	0
Do. Quebec Pine, 1st ..	do.	22	0	0	23	0	0
Do. do. 2nd ..	do.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0		—	
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick ..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	6	5	0	10	0	0
Flooring Boards, 1in. prepared, 1st ..	per square	0	13	3		—	
Do. 2nd ..	do.	0	9	6		—	
Do. 3rd &c. ..	do.	0	8	6		—	
HARD WOODS.							
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba ..	per ft. sup.	0	0	4		—	
Do. Honduras ..	do.	0	0	$3\frac{25}{32}$		—	
Do. Tobasco	do.	0	0	3¼		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0	0	$4\frac{21}{32}$		—	
Do. African ..	do.	0	0	$2\frac{29}{32}$		—	
Do. St. Domingo	do.	0	0	6⅜		—	
Do. Tobasco ..	do.	0	0	$3\frac{3}{16}$	0	3	$4\frac{21}{32}$
Do. Cuba ..	do.	0	0	$4\frac{29}{32}$	0	0	$3\frac{13}{16}$
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks ..	do.	6	0	0	17	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American ..	per cub. ft.	0	3	1		—	

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COMPLETE LIST OF CONTRACTS OPEN.

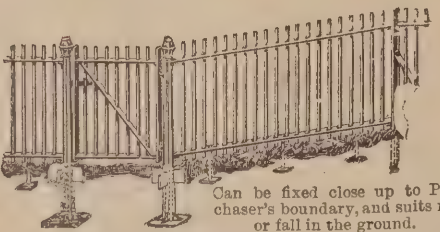
DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
May 17	Aberdeen—House	———	A. Taylor, Overseer, Wardhouse.
" 17	Cadoxton-j-Neath, Wales—Vicarage	Rev. J. D. James	G. E. Halliday, Architect, Cardiff.
" 17	Celbridge, Ireland—Alterations, &c.	Guardians	F. Shortt, Clerk, Celbridge.
" 17	Conway—Dining Hall, &c.	Guardians	T. B. Farrington, Architect, Trinity Square, Llandudno.
" 17	Cumwhitton, Carlisle—Hall, &c.	Committee	J. A. Ferguson, Cumwhitton.
" 17	Elgin—House, &c.	———	A. & W. Reid & Wittet, Architects, Elgin.
" 17	Forres, Scotland—Additions, &c.	———	J. Leask, Solicitor, Forres.
" 17	Llanelly, Wales—Organ chamber	———	Griffiths, Architect, Falcon Chambers, Llanelly.
" 17	Pontypool—Improvements, &c.	Trevethin School Board	Lansdowne & Grigg, Architects, Newport, Mons.
" 17	Desborough—House and Shops	———	D. J. Diver, Desborough.
" 17	Downpatrick—Hospital	District Lunatic Asylum	S. Rea, Clerk, Asylum, Downpatrick.
" 17	Southwark Park—Conveniences, &c.	———	Architect's Department, County Hall, Spring Gardens, S.W.
" 18	Billingshurst—Houses	———	W. Buck, Architect, Horsham.
" 18	Luton—Homes	Guardians	B. B. Franklin, 21 Market Hill, Luton.
" 18	Cardiff—Foundations	———	E. W. M. Corbett, Castle Street, Cardiff.
" 18	Cardiff—Hospital	———	E. W. M. Corbett, Castle Street, Cardiff.
" 18	Mardy, Wales—Chapel, &c.	Trustees	J. Ll. Smith & Davies, Architects, Aberdare.
" 18	Colchester—Billiard Room, &c.	H. L. Griffin	J. W. Start, Architect & Surveyor, Colchester.
" 18	Pettigo, Ireland—Improvements	———	H. H. Aiken, Pettigo.
" 18	Bettws Cedewain—School House	———	Rev. W. Gwynne Vaughan, Bettws Vicarage, Newtown
" 20	Sedgley—Extensions	School Board	A. Ramsell, 187 Wolverhampton Street, Dudley.
" 20	London, N.—Buildings	Urban District Council of Hornsey	E. J. Lovegrove, Engineer to the Council, Hornsey
" 20	Dartford, Kent—Repairs, &c.	Asylums Board	Office of the Board, Embankment, E.C.
" 20	Carlisle—Stabling, &c.	Corporation	H. C. Marks, 36 Fisher Street, Carlisle.
" 20	Darenth, nr. Dartford—Works	Asylums Board	Board Office, Embankment, E.C.
" 20	Ladmanlow, nr. Buxton—Houses	Lime Firms Co., Ltd.	W. R. Bryden, 1 George Street, Buxton.
" 20	Penmaenmawr, Wales—Chapel	Building Committee	J. S. Cloverley, Architect, Penmaenmawr.
" 20	Pwllheli, Wales—School	Governors	A. R. Owen, Solicitor, Pwllheli.
" 20	Rotherham—Brick Tank	Gasworks Committee	Engineer, Gas Offices, Rotherham.
" 20	Gaisgill, Tebay—Alterations, &c.	———	R. Bousfield, Caretaker, Flats, Gaisgill.
" 20	Sheffield—Grand Stand	United Cricket and Football Club, Ltd.	J. Nicholson, Bramall Lane Ground, Sheffield.
" 20	Southwark—Dwellings	Trustees	Waring & Nicholson, 38 Parliament Street, Westminster, S.W.
" 20	Wellow—Rebuilding Churchyard Walls	———	W. J. Willcox, 1 Belmont, Bath.
" 21	Leeds—Red Bricks	Gas Department	R. H. Townsley, General Manager, Gas Office, Leeds.
" 22	Balrothery, Ireland—Cottages	Rural District Council	A. Scott, 16 William Street, Drogheda.
" 22	London, S.E.—Quarters	Asylums Board	Aldwinckle & Son, 20 Denman Street, London Bridge, S.E.
" 22	Leeds—Market Hill, &c.	Market Committee	Leeming & Leeming, Town Hall, Leeds.
" 22	Halifax—Houses	———	R. Horsfall & Son, 22a Commercial Street, Halifax.
" 22	Rotherhithe, S.E.—Male Staff Quarters	Asylums Board	Aldwinckle & Son, 20 Denman Street, London Bridge, S.E.
" 23	Redruth—Business Premises	W. G. Wilton	S. Hill, Architect, Green Lane, Redruth.
" 23	Walthamstow—Four Shops	Trustees	W. A. Longmore, Bridge Chambers, Hoe Street, Walthamstow.
" 23	Sedbergh, Yorks—Additions	———	R. Walker, Architect, Windermere.
" 23	Lindfield—Additions, &c.	School Board	E. Waugh, Clerk, Bolto Road, Haywards Heath.
" 24	Halifax—Houses	———	M. Hall, Architect, Halifax.
" 24	London, N.W.—Additions	Willesden District Council	O. C. Robson, Public Offices, Dyne Road, Kilburn, N.W.
" 25	Halifax—Houses	———	C. F. S. Horsfall & Son, Architects, &c., Lord St. Chambers, Halifax.
" 25	Newcastle-on-Tyne—Materials	Guardians	J. W. Gibson, Union Offices, Pilgrim Street, Newcastle-on-Tyne.
" 27	Oldcastle—Repairs	Rural District Council	T. F. Jenkins, Clerk of Council, Oldcastle Workhouse.
" 27	Burgos, Spain—Market Buildings	———	Commercial Department, Foreign Office, Madrid.
" 29	Holne, Devon—Reservoir, &c.	Paignton Urban District Council	F. W. Vanstone, Palace Chambers, Paignton.
" 29	Newcastle-on-Tyne—Workshops, &c.	Steam Shipping Co., Ltd.	W. Hope & J. C. Maxwell, Trinity Buildings, Newcastle.
" 29	Craigydon—Schools	Llandudno School Board	G. A. Humphreys, Llandudno.
" 30	Kingstown, Ireland—Generating Station	Urban District Council	Town Hall, Kingstown.
" 30	Skewen, Wales—School	Coedfranc School Board	J. C. Rees, St. Thomas's Chambers, Neath.
" 30	Sunderland—Church, &c.	———	J. J. Green, 19 South John Street, Liverpool.
" 30	Tonbridge, Kent—Electric Light Building	Urban District Council	R. Hammond, Consulting Engineer to the Council, Tonbridge.
" 30	London, S.E.—Covered Way	Guardians	G. D. Stevenson, 13 & 14 King Street, E.C.
" 31	West Hartlepool—School Buildings	School	School Board Offices, Park Road, West Hartlepool.
" 31	Portreath—Buildings	———	Portreath Coast Guard Station, Portreath.
" 31	Inishtrahull Island—Schoolhouse, &c.	———	Corbett, Lloyd's Agent, Slipquay Street, Londonderry.
June 3	Gloucester—School	School Board	M. H. Medland, 15 Clarence Street, Gloucester.
" 3	Penlee Point, Cornwall—Fog Signal House	———	Coast Guard Station, Cawsand, Cornwall.
" 4	Aldershot—Buildings	Urban District Council	N. F. Dennis, Surveyor, Aldershot.
" 5	Hull—Coal Depots, &c.	N. E. Railway Co.	W. J. Cudworth, Company's Engineer, York.
	ENGINEERING:		
May 17	Stokestown, Ireland—Repairs	Guardians	T. Murray, Clerk, Stokestown.
" 17	Rotherham—Gasholder	Gas Committee	Engineer, Gas Offices, Rotherham.
" 17	Rotherham—Wiring, &c.	Corporation	E. Cross, Town Hall, Rotherham.
" 17	Lichfield—Electrical Communication	Corporation	H. Russell, Town Clerk, Lichfield.
" 17	Salford—Cooking Apparatus	Guardians	Master, Union Workhouse, Eccles, New Road, Salford.
" 18	Bradford—Crane	Corporation	C. J. Spencer, 5 Forster Square, Bradford.
" 18	Motherwell, Scotland—Lamp Columns, &c.	Electric Lighting Committee	J. Burns, Town Clerk, Motherwell.
" 18	Briton Ferry, Glamorgan—Removal of Lock	Neath Harbour Commissioners	Harbour Offices, Briton, Ferry.
" 19	Huelva, Spain—Locomotive Tender	———	Commercial Department, Foreign Office, Madrid.
" 20	Long Eaton, Notts—Boilers, &c.	Urban District Council	F. Worrall, Council Offices, Long Eaton.
" 20	Ludlow—Machinery and Plant	Corporation	J. H. Williams, Town Hall, Ludlow.
" 20	Heighley—Waterworks	Rural District Council	Barber, Hopkinson & Co., Civil Engineers, Craven Bk. Chrs., Heighley.
" 20	Leeds—Coke-conveying Plant	Gas Committee	R. H. Townsley, General Manager, Gas Offices, Leeds.
" 21	London, S.E.—Wiring, &c.	Bermondsey Borough Council	Town Hall, Spa Road, Bermondsey.
" 21	Bristol—Movable Grain Elevator	Docks Committee	W. W. Squire, Engineer, Cumberland Basin, Bristol.
" 21	Mountain Ash, Wales—Gasworks Extension	Urban District Council	J. Williams, Town Hall, Mountain Ash.
" 21	Workington—Water Works	Corporation	J. Eden, 58 Pow Street, Workington.
" 24	Wivenhoe, Essex—Waterworks	Urban District Council	Sands & Walker, Angel Road, Nottingham.
" 24	Dewsbury—Pumping Plant	———	C. H. Marriott, Son & Shaw, Church Street Chambers, Dewsbury.
" 24	Corunna—Tramway Concession	Spanish Ministry of Agriculture	Commercial Department, Foreign Office Corunna.
" 25	Carlisle—Waterworks	Corporation	C. B. Newton, Engineer, Victoria Viaduct, Carlisle.
" 29	Syra, Greece—Dry Dock	———	Greek Consul-General, Eastcheap Buildings, E.C.
" 29	Paignton, Devon—Waterworks	Urban District Council	F. W. Vanstone, Palace Chambers, Paignton
" 30	Kingstown, Ireland—Electric Lighting Plant	Urban District Council	J. Donnelly, Town Clerk, Town Hall, Kingstown.
" 30	Tonbridge, Kent—Plant	Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
June 1	Christiania—Materials	Government	Afdelingsingeniörens Kontor, Arendal Aamli Banen, Arendal.
" 3	Dublin—Plant	Corporation	S. Harty, City Hall, Dublin.
" 3	Madrid—Tramways	Spanish Government	Commercial Department, Foreign Office, Madrid.
" 6	London, N.W.—Wiring	Hendon Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
" 8	St. Petersburg—Embankment	———	St. Petersburg Town Council (Stadtamt).
" 25	Cairo—Engines, &c.	———	Inspector-General of Irrigation, Upper Egypt, Cairo.
Aug. 1	Manila—Harbour	———	Commercial Department, Foreign Office, Manila.
Dec. 10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.
	IRON AND STEEL:		
May 18	Newcastle-on-Tyne—Rails, &c.	Corporation	City Engineer, Town Hall, Newcastle-on-Tyne.
" 21	Coventry—Manhole Covers, &c.	Corporation	J. E. Swindlehurst, City Engr. & Survyr. St. Mary's Hall, Coventry.
" 21	Leeds—Iron Tubes	Gas Department	R. H. Townsley, General Manager, Gas Office, Leeds.
" 21	West Ham—Ironmongery	Corporation	Medical Superintendent, Plaistow.
" 22	London, E.C.—Iron and Steel Sheets	Madras Railway Co.	Company's Offices, London, E.C.
" 25	Walsall—Iron	Corporation	Gas Office, Bridge Street, Walsall.
" 28	Kyleakin, Skye—Pipes	———	J. A. H. Mackenzie, Architect and Surveyor, Portree.
June 11	London, S.W.—Rails, &c.	Queensland Railways	Queensland Government Office, 1 Victoria Street, S.W.
July 1	Calcutta—Bins	Corporation	Chairman of Corporation, Calcutta.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		PAINTING AND PLUMBING:		
May	18	Barry, Glamorgan—Lead, &c.	Gas and Water Committee	F. M. Harris, Engineer, Gas Works, Barry.
„	20	Bury, Lancs—Painting, &c.	Corporation	A. W. Bradley, Borough Engineer, Bank Street, Bury.
„	20	Kingswear, Devon—Painting	Parish Council	G. A. Casey, Clerk, Kingswear, Devon.
„	20	Warrington—Painting	Cleansing Committee	Borough Surveyor, Town Hall, Warrington.
„	20	Dartford, Kent—Painting, &c.	Asylums Board	Office of the Board, Embankment, E.C.
„	22	London, E.C.—Colours, Varnishes, &c.	Madras Railway Co.	Company's Office, London, E.C.
„	22	Chesterfield—Painting, &c.	Guardians	A. J. Moore, Ashgate Road, Chesterfield.
Aug.	5	Cleckheaton—Interior Renovation of Church	———	Wesleyan Church, Whitcliffe Road, Cleckheaton.
		ROADS AND CARTAGE:		
May	17	Castle Donington, Derby—Materials, &c.	Rural District Council	J. W. Newbold, Clerk, Becket Street, Derby.
	17	Guildford—Levelling, &c., Yards	Guardians	Peak & Lunn, 36 High Street, Guildford.
„	18	Leatherhead—Forming	Urban District Council	Council Offices, High Street, Leatherhead.
„	18	Norwich—Street Works	———	A. E. Collins, City Engineer, Guildhall, Norwich.
„	20	Accrington—Street Works	General Works Committee	W. J. Newton, Borough Engineer, Town Hall, Accrington.
„	20	Nelson, Lancs—Materials	Electricity and Tramways Committee	B. Ball, Borough Surveyor, Nelson.
„	20	Newhaven, Sussex—Granite	Urban District Council	Clerk, Newhaven.
„	20	Rotherham—Paving	Gasworks Committee	Engineer, Rotherham.
„	20	Thornhill, Yorks—Road Improvements	Urban District Council	S. W. Parker, Council Offices, Thornhill.
„	20	Plymouth—Paving	———	J. Paton, Borough Engineer, Municipal Offices, Plymouth.
„	21	Cookham, Maidenhead—Flints	Rural District Council	F. Laurens, 23 St. Luke's Close, Maidenhead.
„	21	Mountain Ash, Wales—Street Works	Urban District Council	Surveyor to the Council, Town Hall, Mountain Ash.
„	22	Barnes—Roads	———	F. & W. Stocker, 90 & 91 Queen Street, Cheapside, E.C.
„	23	Hayward's Heath, Sussex—Granite	Urban District Council	T. Simmonds, Surveyor, Cuckfield.
„	24	Basingstoke—Steam Road Rolling	Rural District Council	H. W Chandler, Clerk, Wote Street, Basingstoke.
„	25	Copford, near Colchester—Materials	Rural District Council	J. Ennals, Surveyor's Office, Copford, near Colchester.
„	29	Havana—Sewering and Paving	Military Governor	Commercial Department, Foreign Office, Havana.
June	4	Maidstone—Materials	Urban District Council	F. Bunting, Surveyor, Fair Meadow, Maidstone.
		SANITARY:		
May	18	Manchester—Supplies	Sanitary Committee	Medical Officer, Public Health Office, Town Hall, Manchester.
„	20	Bury, Lancs—Sewer	Sewage Committee	A. W. Bradley, Borough Engineer and Surveyor, Bury, Lancashire.
„	20	Watford, Herts—Sanitary Works	Asylums Board	Office of the Board, Embankment, E.C.
„	20	Leavesden, near Watford—Drainage, &c.	Asylums Board	Board Offices, Embankment, E.C.
„	21	Aspull, near Wigan—Removal of Nightsoil	District Council	L. Athron, Clerk, Aspull.
„	21	Coventry—Sewerage Works	Corporation	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
„	21	Leeds—Lime, &c.	Gas Department	R. H. Townsley, General Manager, Gas Offices, Leeds.
		TIMBER:		
May	20	London, E.C.—Firewood	School Board	Contracts Sub-Deptmnt., Schl. Bd. Offices, Victoria Embnkmnt, W.C.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
May	17	Hereford—Alterations of Workhouse Buildings	25 guineas each.	T. Llanwarne, St. John Street, Hereford.
„	27	Aldershot—Schools	———	N. Clinton, Clerk to the Board, Station Road, Aldershot.
June	8	Buxton—Water Pump	£20, £10, and £5 respectively.	W. H. Grieves, Town Surveyor, Town Hall, Buxton.
„	10	Ennis, co. Clare—Additions, &c. to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
„	24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100 respectively	W. H. Talbot, Town Clerk, Town Hall, Manchester.
„	24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridg
„	30	Hereford—Municipal Buildings	£100, £75, £50	J. Carless, Offa Street, Hereford.
July	31	Manchester—Fire Station and Police Station	£300, £200 and £100 respectively	W. H. Talbot, Town Hall, Manchester.
No date		Gillingham—School	£10, £5	E. T. Atchison, 28 Waterloo Road, New Brompton.
„		Darlington—Row of Shops and Dwelling Houses	———	Borough Surveyor, Town Hall, Darlington.
„		Salford—Machinery	£50	Borough Engineer, Town Hall, Salford.



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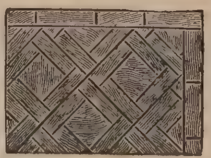

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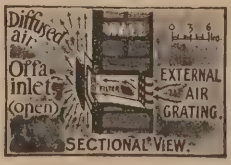

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COMING EVENTS.

Wednesday, May 15.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Dr. Phené, F.S.A., on "Intercourse between the Civilized People of Britain and the great Centres of Learning and Commerce in Eastern and Western Europe, Africa, and Assia Minor, prior to the Roman Age." Mr. A. O. Collard on "The Oyster Dredgers and Flatsmen of Whitstable," at 8 p.m.

SOCIETY OF ARTS.—Mr. Guglielmo Marconi on "Syntonic Wireless Telegraphy," 8 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS' ASSOCIATION.—Ordinary Meeting at 8 p.m.

Thursday, May 16.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Miss Ethel Halsey on "Some Unfamiliar Masterpieces of the Italian School."

SOCIETY OF ARTS (Indian Section).—Mr. L. R. Windham Forrest on "The Town and Island of Bombay—Past and Present," 4.30 p.m.

HOME ARTS AND INDUSTRIES ASSOCIATION.—Annual Exhibition of Work done in Association's Classes opens in the Gallery of the Royal Albert Hall, 2.30 to 7 p.m. Remains open till May 20th.

CAMERA CLUB.—Mr. T. C. Hepworth on "Some Yorkshire Caves and Waterfalls," 8.15 p.m.

BOTANIC SOCIETY.—Meeting at 4 p.m.

Friday, May 17.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.—Mr. P. E. Newton on "A Tour in Mid-France," 7 p.m.

ROYAL INSTITUTION.—Lord Percy, M.P., on "Turkish Kurdistan," 9 p.m.

Saturday, May 18.

ROYAL INSTITUTION.—Professor Flinders Petrie on "The Rise of Civilization in Egypt"—II., 3 p.m.

EDINBURGH ARCHITECTURAL SOCIETY.—Visit to Pitfirrane House and Pittencrief House and Glen.

ARCHITECTURAL ASSOCIATION.—Last Spring Visit to Chesterfield House, Mayfair (Lord Burton's), at 2.30 p.m.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—Meeting at Oswestry.

Monday, May 20.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Prof. W. M. Flinders Petrie on "The Sources and Growth of Architecture in Egypt," 8 p.m.

Tuesday, May 21.

SOCIETY OF ARTS (Applied Art Section).—Prof. W. M. Flinders Petrie on "The Rise and Development of Egyptian Art," 8 p.m.

SOCIETY OF DESIGNERS.—Mr. F. Hamilton Jackson, R.B.A., on "The Essentials of Design for Stained Glass," 8 p.m.

Wednesday, May 22.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

Thursday, May 23.

SOCIETY OF ARCHITECTS.—Meeting at 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

ROYAL INSTITUTION.—Professor Dewar, F.R.S., on "The Chemistry of Carbon," I., 3 p.m.

Friday, May 24.

ROYAL INSTITUTION.—Mr. R. T. Glazebrook, F.R.S., on "The Aims of the National Physical Laboratory," 9 p.m.

Saturday, May 25.

ROYAL INSTITUTION.—Prof. W. M. Flinders Petrie on "The Rise of Civilization in Egypt," III., 3 p.m.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ASHFORD (KENT).—For work in connection with proposed alterations at the Workhouse, for the Guardians of Ashford Union:—

Engineers' work.

Nunn, Tenterden	£2,485	0	0
Benham & Sons, London	2,455	2	8
R. Dawson & Co., Stalybridge	2,335	0	0
Griffith & Co., Sheffield	2,256	16	11
Reed & Son, Brighton	2,227	0	0
Rosser & Russell, London	2,068	0	0
Williams & Co., Cardiff	1,848	0	0
R Dann, Maidstone	1,808	0	0
L. Seager, Sittingbourne	1,799	0	0
Lighting Corporation, London	1,796	0	0
Morwood, Sons, & Co.,* Sheffield	1,578	0	0

Building.

Nunn	3,745	0	0
C. Howland, Ashford	3,345	0	0
Denne & Sons, Deal	3,315	0	0
Gann & Co., Whitstable	3,040	0	0
L. Seager	2,999	0	0
Turner & Co., Walmer	2,955	0	0
Tapner & Co.,* Hastings	2,864	18	0

* Accepted.

FARNWORTH (LANCS.).—For the erection of a new Reform Club, Peel Street, Farnworth. Mr. J. H. Taylor, architect, 15, Grove Street, Kearsley, Farnworth:—

J. Royley, Bridgwater Street, Farnworth	£2,123	0	0
J. Cocker, Walkden	2,100	0	0
Coope Bros., Bank Street, Farnworth	2,057	17	0
W. Myatt, Darley Street, Farnworth	2,045	0	0
J. B. & J. Entwisle,* Bolton Road, Kearsley	2,035	0	0

* Accepted.

GLOUCESTER.—For the erection of Primitive Methodist Church and Schools, Stroud Road. Mr. Harry A. Dancey, architect, 20 Clarence Street, Gloucester:—

A. J. Dolman	£2,022	0	0
W. Jones	1,932	0	0
J. Gurney & Sons	1,923	3	8
Halls Bros.	1,906	0	0
J. Simmonds	1,880	0	0
T. J. Williams	1,866	0	0
W. T. Nicholls	1,854	14	0
W. Byard*	1,854	0	0

[All of Gloucester.]
* Accepted.

HARROGATE.—For the execution of the necessary concrete-brickwork, and masonry in connection with the intended water, tank for the Corporation. Mr. Edw. Wilson Dixon, M.I.C.E., architect, 14 Albert Street, Harrogate:—

Kell Bros., Leeds	£6,800
Waddington Bros., Oxenhope, near Keighley	4,486
C. Myers & Sons, Woodhouse, Leeds	4,240
W. Nicholson & Son,* 9 South Brook Street, Leeds	4,400
B. Firth, Shepshed, Leicestershire	3,864
J. & J. Hallewell, Otley Road, Harrogate	3,749

[Engineer's estimate, £4,400.]
* Accepted.

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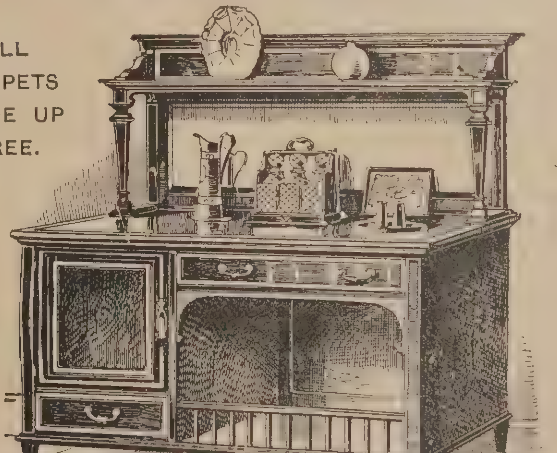

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Contract No. 1.—Beach and cement.

Pickard, Worth	£6,497
R. Cook & Son, Crawley	6,235
W. E. Constable, London	5,600
Walker & Son	5,597
Hobman & Co., London	5,563
G. Kent, Hayward's Heath	5,378
Saunders	5,182
King, Worthing	5,076
C. Mayo, Hayward's Heath	4,998

Contract No. 2.—Tar paving.

R. Cook & Son	5,021
Hobman & Co.	4,555
Chittenden, Lake, & Co., Maidstone	4,188
W. E. Constable	3,997
C. Mayo*	3,619

* Accepted.

HUNSTANTON (NORFOLK).—For the erection of residence at Hunstanton, Norfolk, for Mr. E. Dawbarn. Mr. H. J. Green, architect, Norwich:—

W. H. Brown, King's Lynn	£1,554	19	6
F. Giddings, St. Ives, Hunts	1,537	1	5
W. F. Smith, King's Lynn	1,400	0	0
F. Southgate, Hunstanton	1,126	0	0

ILFORD.—For forming and kerbing and sewering Benton Road, Ilford, for the Crown. Messrs. R. B. Grantham, engineers, 23 Northumberland Avenue, W.C.:—

Ballard, Limited, Child's Hill	£2,857
J. Jackson, Forest Gate	2,722
Glenny, Colchester	2,712
T. Adams, Wood Green	2,698
W. Neave, Paddington	2,510
E. Rogers, Notting Hill	2,498

LEICESTER.—For the extension of the Leicester Infirmary. Messrs. Everard & Pick, architects, Leicester:—

Clark & Garrett	£11,130
J. Hutchinson & Son	10,989
J. E. Johnson & Sons	10,880
H. Bland	10,757
T. Herbert	10,679
W. Moss & Sons	10,500
H. Herbert & Sons	10,497

LEICESTER.—For the erection of sawmill, offices, stables, timber-shed, &c., on land adjoining the Recreation Ground, Welford Road, Leicester, for the Directors of Smith's Timber Company, Limited. Mr. Walter Shaw, architect, "The Drapery," Northampton:—

Poynton	£4,181	0
Chapman	3,145	0
Pipes	3,130	0
Wright	3,121	0
Richardson & Son	3,092	0
Riddett & Son	3,089	0
Beck & Co.	£2,998	0
Sharp	2,990	0
Johnson & Son	2,963	0
Herbert	2,955	0
Marston & Son*	2,946	0
Storer Bros.	2,314	10

[All of Leicester.]
* Accepted.

LLANELLY.—For building Vestry and Chapel House at Capel Newydd, Llanelly. Messrs. J. Davies & Son, M.S.A., A.M.I.C.E., architects, Cowell House, Llanelly:—

J. Llewellyn, Bryncawan Terrace	£1,570	0	0
P. J. Michael, Myrtle Terrace	1,569	0	0
Brown, Thomas, & John	1,558	0	0
T. Evan & Sons, Pwll, Llanelly	1,397	0	0
J. Evans, Erw Building Yard	1,240	0	0
H. Thomas & Son, Pottery Road	1,208	0	0
W. Hopkins & Son, Coldstream Street	1,195	7	11
Jones & Richards, Pottery Place	1,192	0	0
B. Howell & Son, Limited,* New Dock	1,169	0	0
T. Hughes, J. P.,† Bres Yard	969	0	0

* Accepted. † Withdrawn.

MIDSOMER NORTON, SOMERSET.—For the erection of new school buildings for 486 children in the High Street for the Trustees of the Wesleyan Day Schools. Mr. William F. Bird, architect, Midsomer Norton, Somerset. Quantities by the architect:—

E. Walters, Montpelier, Bristol	£4,635
Stephens & Sons, Fore Street, Exeter	3,998
A. W. J. Catley, Midsomer Norton	3,880
Wills & Sons, Spring Gardens, Bath	3,698
William Tovey, Midsomer Norton	3,620
Tom Keeling,* Timsbury, near Bath	3,515

[Architect's estimate, £3,816.]
* Accepted.

NOTTINGHAM.—For the erection of sale shop, dwelling, bakehouse, &c., Trent Boulevard. Mr. Harry Allcock, architect:—

T Barlow	£1,307
W. Inger	1,286
Parnell	1,260
G. A. Pillatt	£1,195
J. G. Thomas*	1,195
Crane & Co.†	1,185

* Accepted. † Late.

RUSHDEN.—For the erection of two houses, Higham Road, for Mr. F. J. Abbott. Mr. H. Adnitt, architect, High Street, Rushden:—

F. Henson, Finedon	£580
Hacksley Bros., Wellingborough	570
R. Marriott	559
T. Wilmott	550
C. E. Bayes	549
T. & C. Berrell, Irchester	549
Whittington & Tomlin	545
H. Sparrow	540
E. Mitchell*	519
T. Swindall	517

[Rest of Rushden.]
* Accepted.

RUSHDEN.—For alterations and additions to shop and printing offices, High Street, for Mr. W. Mark. Mr. H. Adnitt, architect, High Street, Rushden:—

T. Swindall	£370
T. & C. Berrell, Irchester	323
Whittington & Tomlin	319
H. Sparrow	307
E. Mitchell*	300

[Rest of Rushden.]
* Accepted.

SUTTON COLDFIELD.—For the erection of new Congregational School and caretaker's house, Station Street, Sutton Coldfield, near Birmingham. Mr. Harry H. Reynolds, architect, Warwick Chambers, 16A Corporation Street, Birmingham:—

Surman & Son	£2,890
F. Davis	2,797
J. E. Moorhouse	2,750
J. Webb	2,659
J. W. Smith	2,613
Turville & Son	£2,591
W. H. James	2,549
I. Langley	2,532
W. Lee & Son*	2,499

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

May 22, 1901.
No. CCCXXVIII.

Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

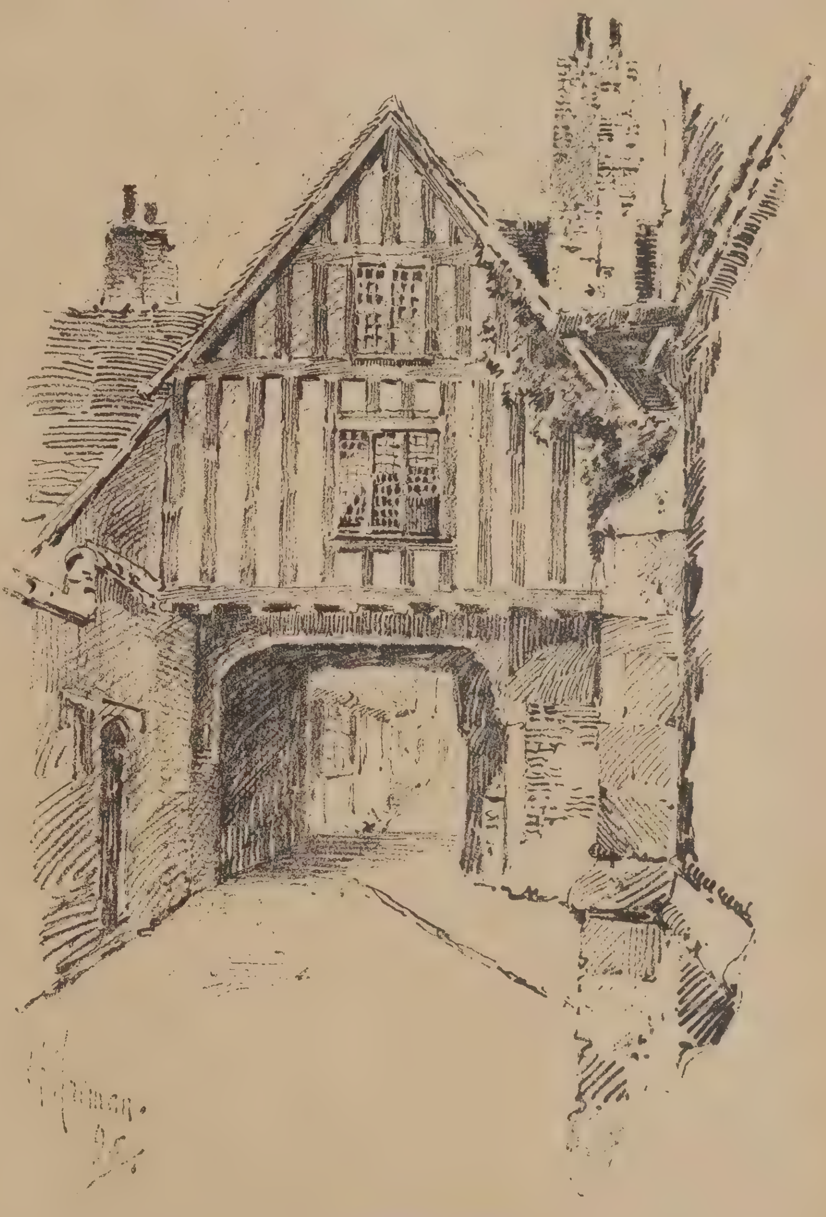
Once More. THE London County Council, in its eagerness to be artistic, is responsible for the new set of florid electric-lamp standards now being erected along the Victoria Embankment. These have been cast by Messrs. Walter Macfarlane & Co., and have an ornate base decorated with ornate fishes possessing ornate tails; while at the top of the shaft there is spiral—design (shall we say) from which the arc lamp will depend. Why will the Council spend money on such things, when so much better are obtainable? It is no more expensive to cast a good design than a bad one. We do not know whether these standards were designed in the Council's offices or in those of Messrs. Macfarlane, but that they are artistically a failure is at once evident by comparing them with those elegant standards by Vulliamy which extend in close proximity along the top of the Embankment wall.

A Half-timbered House. THE sketch of a half-timbered house on this page was made from a photograph by Mr. Herbert Norman as a time study (one hour being allowed) at the sketching class that used to be held in connection with the Birmingham Architectural Association.

The Pyramids. OF all the problems associated with the Egyptians none is more interesting than that summed up in the question, How were the Pyramids built? The land of the lotus is ever a mystery to us, the civilisation of its ancient people an enigma, its colossal ruins awe-inspiring, wondrous and unique in the history of the world. Our knowledge, however, of their aims and achievements is slowly growing in extent and lucidity, thanks to the painstaking investigations of archæologists, scientists and engineers, and we now know for certain that the Egyptians were a most scientific and mechanical people. Nebka, a king who lived nearly six thousand years ago, was "skilled in the art of erecting solid masses of hewn stone," and the practice continued for thousands of years, the passion for building colossal structures being most predominant between B.C. 1600 and 1200. Cheops, in his great pyramid, was content with stones weighing about fifty tons each, but stones twenty times as heavy were used in the two huge statues of Amenhotep III. on the plain of Thebes. Solomon put a 90-ton stone in the outer wall of Temple Hill at Jerusalem 100ft. from the ground, while the portal of the treasury of Atreus is covered by a stone weighing 130 tons. Then, again, coming to later times, we find stones 40ft. long, 10ft. thick, and no one knows how wide, in the castle wall at Osaka in Japan, and even if they are only 10ft. wide they would each weigh 300 tons. It cannot be denied, as Commander Barber says in his recently-published book on "The Mechanical Triumphs of the Ancient Egyptians," that a huge solid stone statue is more imposing than anything built up in small pieces. What are the Goddess of Liberty (150ft. high) at the entrance to New York Harbour or the Sleeping Buddah of Bangkok (160ft. long), both hollow, in comparison to the granite statue of Rameses the Great! "They need care to prevent decay, and they will never remain of themselves an everlasting monument of the Godlike power of a king." But the problem is, How did the Egyptians erect such wonders? There have been a great number of theories expounded, but after all the old one of the inclined plane is the most probable and the most satisfactory.

There is no doubt (or there is ample reason to believe) that the Egyptians were acquainted with the principles of the lever, the wedge, the wheel and axle, and the screw. The weighing of the heart as described in the Book of the Dead (a work already ancient more than six thousand years ago) shows a lever with the fulcrum between the power and the weight, and the shadoof (for raising water) is another example that might be mentioned. Then the sagguieh, which no less an authority than Viollet-le-Duc says was common in Egypt in the first three dynasties, contains the principle of the capstan and the windlass. Most writers do not think the use of the pulley was then known, but Commander Barber maintains (by Queen Hatasoo's "Expedition to Punt") that it was.

As already stated, the inclined plane offers the most feasible solution of the problem under consideration. The Pyramids, it has now been conceded, were tombs, and nothing but tombs. When they were built labour and material were unlimited. The first stones were dragged from the quarry to the site and there laid. Then the incline was built of sun-dried bricks, and it increased in length as the structure grew higher and higher, until eventually it was miles long. The heaviest stone in the Pyramid of Cheops weighs sixty tons. Assuming it was placed on a kind of cradle, and grease employed to reduce friction, a force of twelve tons would then need to be applied in order to drag the block up the incline—that is, about 900 men. (M. Le Bas, who brought the Paris obelisk from Luxor in 1832, estimated then that one-fifth or one-sixth of the total weight of an object was ample for all grades up to 1ft. in 10.) It is a local tradition that an incline plane five miles long was employed in the building of the great Hindu temple in Tanjore, which conforms with the generally accepted theory respecting the Pyramids. As to the idea that the Egyptians possessed a number of wonderful inventions with which we are not now acquainted, this may or may not have been so; but there is no proof forthcoming that they did. The probability is that they executed their works with lever, wedge and other simple mechanical appliances, combined with an unlimited supply of material and a vast army of men. (It may be mentioned that Commander Barber's book is published by Messrs. Kegan Paul, Trench, Trübner & Co., of Paternoster House, Charing Cross Road, price 3s. 6d.).



A HALF-TIMBERED HOUSE.

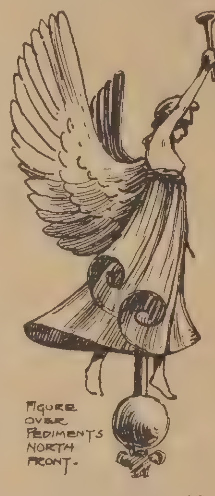
In Abeyance. IT is only natural that the zeal displayed in connection with the Queen Victoria Memorial should now have abated, leaving matters in abeyance for a while; but during this time the five selected architects are still busy with their designs, and it is probable we shall hear little further of these till they are exhibited at the end of June. Whether the committee will then put into practice the general demand for a public competition remains to be seen, but we are inclined to think they will not. We do not see how, having embarked upon their scheme, they could very well inform the chosen architects that they had changed their mind and would not therefore require their services.

With Special Sketches by J. Jeffrey Waddell.

THERE can be but one opinion about the International Exhibition now open at Glasgow; it is undoubtedly a great success, both as regards the buildings and the exhibits contained within them. Since Prince Albert planned the great gathering of the industries of all nations which marked the close of the first half of the nineteenth century, similar displays have been held in many countries. Some have been attended with success, others have been marred by failure; but the general effect of them all has been to promote friendly intercourse among the races. Scotland came late into the field, and the last quarter of the century had run many years of its course before anything of an international character was attempted. Although slow in beginning, however, the people showed that they knew how to succeed. In 1886 Edinburgh organised an exhibition memorable on account of its wealth of art treasures, and then two years later came the Glasgow display, the success of which is visible in the handsome building at Kelvingrove, which will, before many months are over, accommodate the celebrated collection of pictures belonging to the Corporation. Other exhibitions there have been, but those mentioned will be most widely remembered. The Exhibition of 1888 occupied the plain opposite the University, and the promoters of the present enterprise did not see that they could do better than use it again. More than two years have elapsed since the project of organising an International Exhibition in 1901 was decided upon, and during that interval the Executive Council worked most assiduously to perfect the details of the vast undertaking. The buildings, which extend over more than 100 acres, are divided into three great sections—the Industrial Hall, the Machinery Hall and the Art Galleries. With the exception of the Machinery Hall, together with the boiler and dynamo house, they are situated in Kelvingrove Park, and on the slopes of Gilmore Hill, the site of the Exhibition of 1888. The Machinery Hall is situated on Bunhouse Grounds (about six acres in extent) on the south side of Dumbarton Road, but connected with Kelvingrove Park by a wide bridge.

One great advantage possessed by the site is its hilly and diversified nature. Most exhibitions are all on the flat, but in Kelvingrove Park there is hardly any flat. It is in reality a ravine or glen, which must once have been wild and romantic, but is now subdued to the uses of an artificial pleasure ground and surrounded by houses or other buildings. The river Kelvin enters through a deep cleft, from which the hills rise abruptly on both sides, curves sharply round, and then winds away in the opposite direction. The banks of this winding stream are the park. The north bank, on the top of which the University stands, is steep and lofty all along; the south bank, high at first, slopes down and spreads out into more undulating ground. The main buildings occupy this undulating ground and extend along the whole length of it in a broken and irregular line, with separate pavilions and kiosks dotted here and there; but the Exhibition is not confined to the south bank, as one rather supposes at first sight. It extends also to the steep side opposite, below the University, and visitors should not miss this part. Here are a lighthouse, a large restaurant, and a whole street of important private stands high up the hill, and below them again, close to the river, a street of amusements.

The best point of view is the hill close to the lighthouse or the large restaurant near it. There you have the whole thing laid out before you from end to end, beginning with those fantastic Russian roofs and pinnacles on the extreme left and ending in the Machinery Hall on the extreme right with the great central hall in face, a cluster of towers and minarets, surmounted by gilded dome and soaring white-winged figure, which seems to be taking flight upwards into the sky, so lightly it touches the golden ball at its feet, so airily it is poised, gleaming white like a sea-bird in the sun.



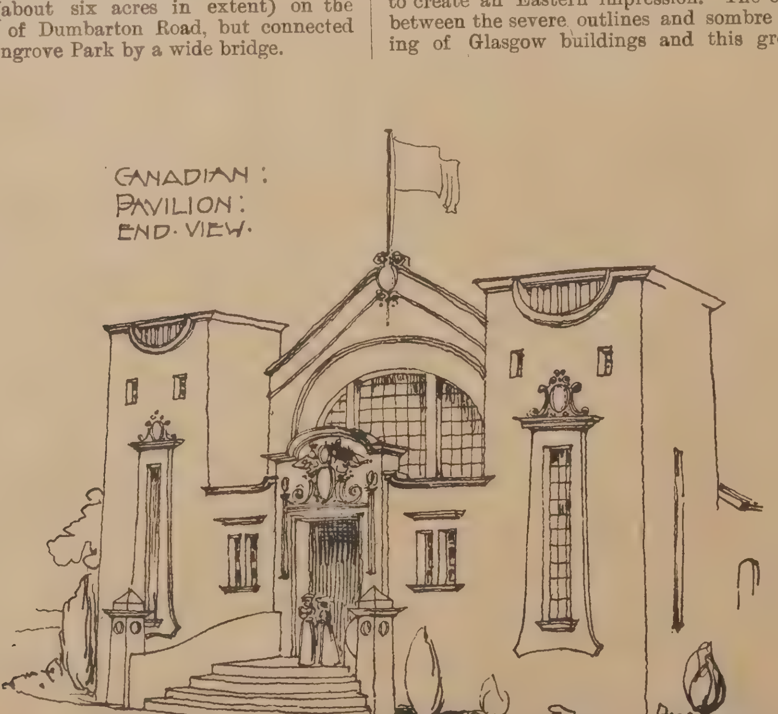
The prevailing colour is pure white, set off with harmonious reds, greens, gold and sky-blue. The prevailing form is Oriental, in suggestion rather than in strict design. The Moorish spirit of the Spanish style, which has been largely used, combines with Byzantine forms, minarets, cupolas, kiosks, bungalows and pagodas to create an Eastern impression. The contrast between the severe outlines and sombre colouring of Glasgow buildings and this group of bright, fanciful and bizarre erections suddenly reared in their midst is startling. It is a sudden transition from the most uncompromising prose of everyday existence to fancy, imagination and romance. And then you find, after all, that the romantic exterior is only a setting for all that is most strenuous and actual in the real world of to-day.

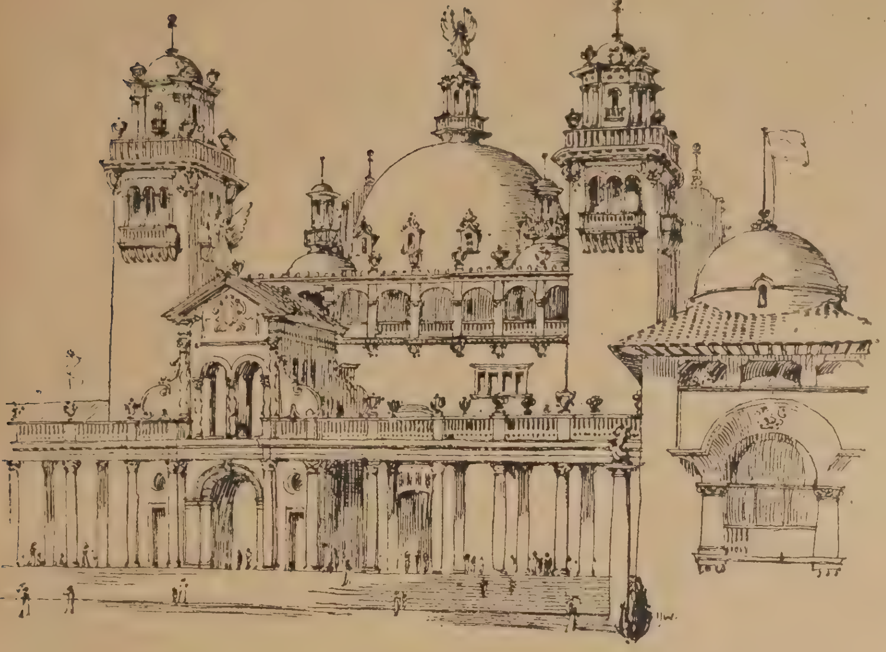
With regard to the disposition of the buildings, however, a Glasgow architect writes in the "Glasgow Herald" as follows: "In the all-important matter of plan, and in the first place, as regards the distribution of the various buildings throughout the grounds, it is regrettable that more attention has not been paid to the symmetrical arrangement of these on main axial lines. The irregular nature of the ground to be dealt with no doubt rendered this difficult of achievement, and the fact that the number and importance of the minor buildings were not anticipated when the scheme was first set afoot must also be taken into account. Still the fact remains that the general effect is rather that of a jumble, picturesque undoubtedly, but not comparable with the grandiose impression produced by long vistas of buildings, culminating in a central dome or other important feature, such as has characterised previous Exhibitions elsewhere, and not less notably Glasgow's rival across the Atlantic, the Pan-American Exhibition being held in Buffalo this summer."

The exterior of the Exhibition is designed after the style of an Eastern palace. It is in every way a bold design, and at the same time reveals qualities of restraint and judgment. Mr. James Miller, the architect (who was awarded the first premium of 200 guineas in open competition), has chosen as his style of a building a phase of Spanish Renaissance which flourished in the sixteenth century; but although the design is touched with Spanish characteristics, the general feeling is decidedly Eastern. There is great freedom of detail and exuberance of ornament, especially shields and vases, of which Mr. Miller always makes a feature: his balustrades also have always great originality and beauty of outline. In general character and picturesqueness the buildings harmonise well with the new Art Galleries. The style is most conspicuously developed in the Industrial Hall, which constitutes the main portion of the Exhibition.

The grand, or ceremonial, entrance is towards the Park, in the centre of the north facade, nearly opposite the bridge to the east of the Museum. Here the architect has displayed much originality. The front of the building is deeply recessed, so as to form a piazza about 200ft. long by 100ft. wide, behind a double range of classic columns 30ft. high, which, forming a screen nearly 200ft. long, continues the line of the north part of the buildings. Right round the whole building there runs an arcade of arched windows, the openings being divided by balustrades, which are supported in a very artistic manner on cherubs' heads moulded into the cornice beneath. These arches are flanked at the end of each bay with corner towers about 32ft. square, rising to a height of almost 60ft. The towers are surmounted with flattish domes—a feature of the period from which the style has been taken—terminating with flagstaffs carrying national flags. At the centre of the side wings there is an ornate hanging Spanish balcony, at the top of which is a figure emblematic of the Age of Electricity.

The approach to the grand entrance is made by a great flight of steps, rising from the main promenade in the Exhibition. This promenade extends from the Russian section, and has a continuous stretch on the east side past the Canadian section, along the front of the Industrial Hall and Art Galleries, terminating at the east of the Kelvin valley. Entrances of a less imposing character are provided in Sandyford Street and Gray Street. The central feature of the former entrance is entirely different from that in the main facade. It is flanked by two tall towers, and projecting towards the street there is a huge semi-dome bulging out into a verandah, thereby giving a variety of curve which harmonises well with the straighter lines of the towers and gables behind. The Gray Street front is flanked by two tall towers, about 120ft. high, with a great, deeply-recessed semicircular arch springing about 20ft.





VIEW OF DOME AND TOWERS FROM THE RIVER KELVIN.

off the ground, and nearly 50ft. in diameter. A verandah runs along the whole length of the towers. There is also an entrance to the Exhibition from Dumbarton Road, opposite the main entrance to the Art Galleries, leading into the main avenue.

The striking feature of the whole design, however, is the group of towers in the centre of the Industrial Hall. This occupies the centre of the grounds and faces the University The building is 700ft. long and 330ft. wide, and covers an area of more than 23,000 sq. ft. It consists of a great central dome, surrounded by four huge towers, rising to a height of about 160ft. From the apex of the dome, which is 135ft. from the ground level, there rises a beautifully-decorated fleche, 32ft. high. Resting on the fleche there is a large winged female figure of "Light" by Mr. Albert H. Hodge, of London. It is 12ft. high, the wings stretching 12ft. The right arm is extended upward, and in the hand she carries a torch electrically lighted, while in the left hand she bears a branch of palm. The lips are parted as if making proclamation. On the head is a helmet, while the robe from waist to ankle spreads out in ample folds. The main avenue of the Industrial Hall has a roof span of 103ft. designed on the "three-hinged arch" principle to counteract the expansion and contraction due due to changes in temperature.

The interior of the dome is decorated in colour and by groups of figures emblematic of Art, Science, Industry and Commerce. The spandrels are ornamented in a very effective way by colossal groups representing the Triumph of Navigation, and modelled by Mr. Albert H. Hodge. Immediately under the dome is a colossal figure of the King. The four towers which surround the dome at an effective distance form at their base the corners of an open arched balcony, to which visitors have access by means of two electric lifts in the south-east tower and by staircases built within the north-west tower. This balcony is 500ft. in circumference. Between the dome and the four main towers, and in line with the diagonals of the latter, have been erected four artistically-designed minarets. Apart from the elegance of the decoration, the whole group of minarets, towers and dome makes a unique spectacle, and gives a bold and striking character to this central part of the design. The cupolas of the four great towers, and also the cupolas of the minarets, are covered with gold; the main building is finished in pure white, while the roofs of the domes are painted pale green.

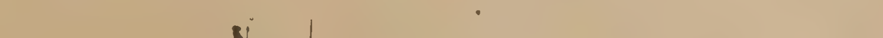
A fine contrast is made by the decorative treatment of the eight corner towers. These are covered with red Spanish tiles, the corrugated iron running along the roof between the towers being painted a bright orange tint, while the woodwork of the red-tiled wide-spreading eaves is treated in green.

The whole of the external finishing of the buildings, including all the decorative work, is formed of fibrous plaster, composed of stucco, canvas and wood. This material is run into a mould and allowed to harden. The plain work is made in boards about 2ft. by 4ft. and $\frac{3}{4}$in. thick, nailed to a wooden framing, pointed, and then flushed up in stucco when in position. The ornamental work is cast into large moulds of the same material. Messrs. George Rome & Co. undertook the work. Quite half a million yards of cloth have been used, and the plastered work has cost altogether something like £25,000.

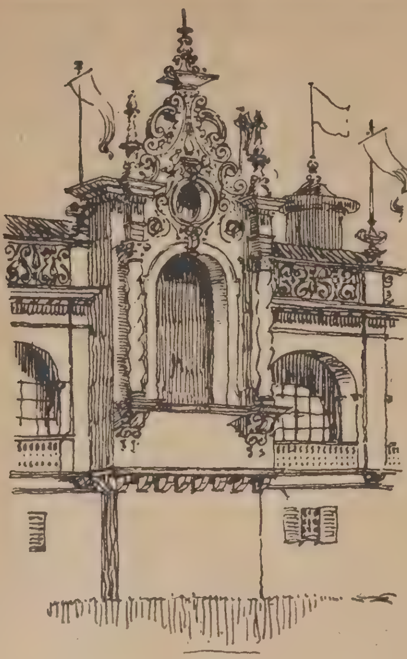
Far eclipsing any foreign exhibit in the grounds, the Russian section is deserving of special notice. It is the largest and most costly section ever staged by the Tsar's Government at any exhibition, and £30,000 was voted for its support last year. The space allocated to Russia covers 29,705 sq. ft. in the grounds and 11,131 sq. ft. in the Industrial Hall. The chief feature, or features rather, are the four buildings which have been erected at the north-east corner of the grounds. The buildings are almost entirely constructed of wood, and were built by Russian artisans sent over to this country about the New Year. There were 180 men employed, and as the work took fully four months an idea may be formed—even allowing that the visitors are slow tradesmen—of the nature of their handiwork. The kiosks were designed by a prominent Russian architect, M. Zelenko, of Moscow, and erected under his personal supervision.

The designs are intended to represent the old national architecture of North Russia. They are not copied from any existing buildings, but from old prints and drawings, various details being taken from different sources and put together. This explains the fantastic effect, as there is not only a mixture, but the decorations which may have been suitable enough on a small scale, in private houses for instance, are here magnified to colossal proportions. For the purpose of attracting attention nothing could be more effective. These huge and curiously-shaped structures, with their bright red and green roofs, draw the eye almost more than anything else in the Exhibition. The agricultural pavilion is being prepared inside for the reception of the Tsar, who will visit the Exhibition. The whole enterprise may be regarded as a deliberate step in that policy of commercial development of which the Siberian Railway and other large undertakings are recent signs.

The Canadian Pavilion is very effective. Messrs. Walker & Ramsay, of Glasgow, were the architects. The building measures 180ft. long by about 60ft. broad, and has 11,000 sq. ft. of space for exhibits. The Canadian Govern-



·THE· MAIN·ENTRANCE·
·SANDYFORD·STREET·



GABLE, SOUTH FRONT OF MAIN BUILDING.

ment have taken up the matter with great enthusiasm, and every State in the Dominion is represented.

The Grand Concert Hall, a circular building having a wide gallery and promenade supported on cantilevers, is connected by a covered way with the Industrial Hall. The structure is best described, in Mr. Miller's words, as a gigantic steel umbrella. The dome is coloured blue on the outside. With regard to the entrance front, however, one does not look for, or even desire, purity of style in such work; but angle pavilions of Venetian Gothic, a central doorway and balcony Italian in scheme (though certainly not in proportions), with connecting wings closely based in design on the loggia of a Spanish "patio," if the combination is to be successful, require more care and skill in the blending than have been bestowed in the present instance. The hall itself is admirably arranged, though it has not been improved by the colour decoration, particularly in the interminable repetition of shields with the same armorial bearings "picked out" in gold and colours on the balcony front. On the whole, this portion of the Exhibition is the least satisfactory, and one is as sorry that it is to be permanent as that the centre group of dome and towers on the main building must be temporary. The hall, moreover, is not a success acoustically.

The internal colour decoration throughout the various buildings, and more especially the lack of it, forms indeed one of the least satisfactory features of the scheme. The decoration of the main dome, designed and carried out by Messrs. Dall & Neave, is not altogether successful. The individual figures are good, some of them particularly so, but the scheme is not sufficiently large or dignified for such a situation and the vast scale; and the colour is thin and not particularly harmonious.

By contrast, the sculpture work throughout the Exhibition is worthy of the highest praise. In this Mr. Albert Hodge, with his assistant modellers, Messrs. Holmes & Jackson, has rendered the architect yeoman service.

(*To be concluded.*)

A New Church at Telford Park is being erected, and is to be dedicated to St. Thomas. The plan of the church is cruciform, and the style Transitional. At present only the nave is being built; the additions of chancel and transepts are to be added as funds come in.

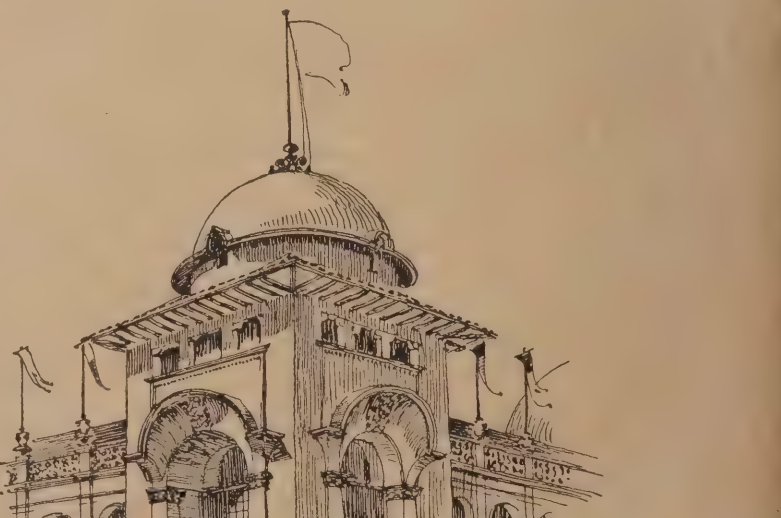
A Town Hall for Cheltenham recently formed the subject of a Local Government Board enquiry into an application by the Town Council for sanction to a loan of £35,000. It is proposed to be erected upon the northern portion of the lawn surrounding the winter garden structure in Imperial Square.

PLYMOUTH CITADEL.

PLYMOUTH CITADEL, which figures prominently amongst the few remaining ancient institutions in the borough, is undergoing extension, and the increased accommodation will entail an expenditure of something like £40,000. The fortress is being transformed into an artillery depot. Entering the Citadel by way of the famous gate which overlooks the town—the bold and spirited carvings on which are supposed to have been the work of Sir Christopher Wren—one is faced by a tall block of buildings, for the officers' quarters and mess, forming a striking contrast to the erections close by. The buildings are of local limestone, with Portland stone dressings.

On the east curtain wall of what a few years ago formed the inner ramparts of the old historic fortress an effort is being made to engraft in the new building some of the spirit of historical antiquity with which it is surrounded. Access is only obtainable on one side. The demolition entailed for the erection of the new recreation and soldiers' block affects the least interesting portion of the fortress, and the elevation has been so designed to disturb as little as possible the repose of the old ramparts. The old massive granite plinth and string course are rebuilt in the new work at their original level, thus preserving that continuity of long low lines with which the eyes have become familiar, and which is characteristic of the Citadel. The walls are built of local limestone with Portland stone dressings, a 3in. cavity and a lining of 9in. brickwork. In the centre of the quadrangle has been placed the fine old statue of George II., which has been removed from the site of the new officers' mess. The statue was erected in 1728, at the expense of Captain Louis Dufour, and is the work of an artist named Robert Pitt The centre portion of the eastern elevation bears a carving of the royal arms in the pediment. The work is done in Portland stone, and immediately below are the words: "Built on the old ramparts in the 60th year of Her Majesty's reign." The wings of the block, which form the quadrangle, each contain accommodation for thirty men, offices and bath and cook-houses. The tail ends of both wings are only about half the elevation of the main buildings, and have granite porticos. The general arrangment and treatment of the interior is simple. The recreation block, with its reading and recreation-rooms, coffee-room and bar, grocery shop and manager's quarters, is placed in the centre, with the long soldiers' barrack wings flanking it on either side, and, at a point dictated by the conditions of the site, returns to form three sides of a quadrangle. The cook-houses and baths terminate the wings, and are, therefore, conveniently situated for all the barrack-rooms. In close proximity to the northern wings of the soldiers block a large building—a canteen and recreation-room—is nearing completion. Like the large block of buildings to be erected for married men's quarters outside the east curtain wall, adjacent with the roadway, it consists of local granite, with Portland stone facings. The architect who has suggested and designed all the Citadel additions and improvements is Mr. T. Rogers Kitsell, F.R.I.B.A. The foundation of the Citadel is said to have been laid on June 12th, 1671; but six years before that date the great fort on the Hoe is recorded to have been commenced, taking the place of a small fortress built with money raised by means of a tax laid upon pilchards brought into the port. The Citadel was designed by Sir Bernard de Gorme, and whilst it was in progress the works were inspected by Charles II. and his brother James. It consisted of five bastions, with intermediate works, and was originally mounted with 165 guns. Immediately outside the northern rampart of the Citadel, on ground granted by the Corporation, it is proposed to erect headquarters for the 2nd Devonshire Volunteer Artillery, W.D.G.A. The work of designing plans is now in hand. The covered drill-shed will be about 120ft. by 60ft., and the armoury 30ft. by 20ft. There will be spacious rooms for all ranks, coffee bar for the gunners and junior non-commissioned officers, an orderly room, adjutant's office, lobby, store and caretaker's premises. The frontage, which will probably be of local limestone with Portland stone dressings, will have a northern aspect.

Twenty New Almshouses at Wakefield are being erected in Denby Dale Road, ten for men and ten for women, with a nurses' home in the centre, for the Governors of Wakefield Charities.

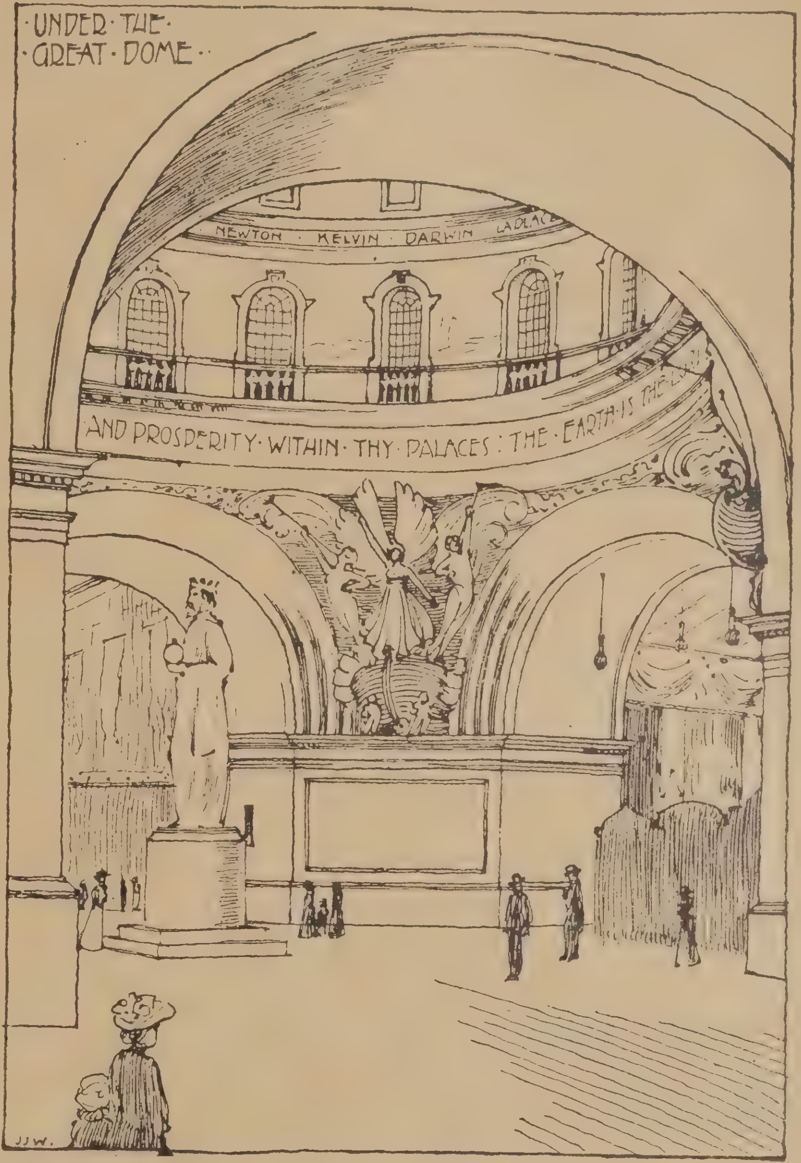


ANGLE PAVILION, GLASGOW EXHIBITION.

HITCHIN NEW TOWN HALL.

THE new Town Hall at Hitchin was opened recently, after having been in course of erection for eighteen months, on the site at the top of Brand Street, with a frontage of 78ft. The accommodation provided in the building is as follows: The entrance vestibule, which is 18ft. 6in. by 17ft., is entered from Brand Street, under a deeply recessed arch. The vestibule contains a ticket office, a fireplace, two doors into the hall, and opens by arches on the left to the principal staircase, and on the right to the communication corridor. This corridor, which is 6ft. wide, and with the staircase at the far end, runs the whole length of the hall, is lighted by glass domes in the ceiling, and has entrances into the hall and an emergency exit door into the joint right of way between the Town Hall and Blue Cross buildings. This corridor is a special feature of the building. As well as the above, in the front or public office block, are contained, on the ground floor the town surveyor's office 14ft. 6in. by 14ft. 6in., with ample cupboard room; the gallery entrance into Grammar School Walk and gallery stairs; the principal staircase, and ladies and gentlemen's cloak-rooms with lavatories to each, the gentlemen's being entered from a door off the corridor. In the basement is a heating chamber. On the first floor are the landing of the gallery staircase with a small ticket office and a pass door into the principal staircase landing. The gallery entrance and the stairs, which are constructed of teak 2in. thick, is so arranged that it can be used as the ordinary office entrance, but during entertainments the pass door at the top is intended to be locked. On the first floor are also the town clerk's office, 19ft. 3in. by 14ft. 6in., a waiting lobby to the Council Chamber, 9ft. by 7ft. 6in., with a secondary entrance to the gallery; a committee room, 11ft. by 10ft., and the Council Chamber—a large room 30ft. long by 19ft. 3in. wide, and 16ft. to the highest part of the ceiling. The hall is in length 76ft. 6in., and the breadth is 40ft.; the height to crown of ceiling is 26ft. and to the spring of the arches (that is to the top of cornice below the windows) 11ft. 6in. It is lighted by ten large semicircular windows, and four dormer windows, all of which have swing casements, and has a gallery across one end. The entrances are as follows: Two from the vestibule, an emergency exit to the Grammar School Walk, and two exits into corridor. There is a communication door from the hall to the stairs to the stage, &c. The stage floor is 3ft. 6in. above the hall floor, and is laid to a slope upwards from front to back of 6in., and there are steps at each side on to the hall floor. The width of stage is 26ft.; the depth, from face of pilasters to the back wall is 18ft. 6in., and the stage projects into the hall 2ft. 6in., making a total depth of 21ft. There are doors communicating with a retiring room on the Blue Cross New Building side and with the stage exit and retiring rooms on the Grammar School Walk side. The retiring rooms from the stage are 11ft. by 10ft. on the Grammar School Walk side, and on the Blue Cross Brigade building side 17ft. by 7ft. 6in. The latter room has a fireplace, and each has lavatory accommodation attached. There is a third retiring room 14ft. 6in. by 13ft. 8in. on the first floor on the Grammar School Walk side, approached by stairs 3ft. wide from the stage entrance. On one side of the stage is arranged a storage for stage properties, divided from it by movable shutters and a hinged door, and at the back of the building is a large yard, a portion of which is covered by a glass roof forming a shelter for storage purposes. The whole space under the stage block is used as a chair storage, and there is also kitchen accommodation.

The architectural style of the building may be described as a simple treatment of the late English Renaissance. The main object in view in the structure was to bring the building into line with such fine houses as the old Brewery House in Sun Street, or the smaller houses of like character in Bridge Street, as well as others about the town. The circular form of ceiling to the hall was adopted for various reasons, the principle being that it was good for sound, and was economical in construction. The roof is carried by steel trusses which do away with all thrust, and reduce the load to a dead weight. The main front is towards Brand Street, and consists of a central portion containing the principal entrance in a deeply recessed arch, and flanked by Ancaster stone pilasters which run right up to the cornice; the space above the arch and between these pilasters is filled with rough-cast. It is crowned by a pediment containing a device executed by a modeller from Mr. Gilbert Seale's studio in London, who executed all the ornamental plasterwork. It is in Portland cement, and is built up on the face of the brickwork in some places to a depth of 8in. Flanking this central portion are six windows on each side, the larger ones being on the first floor, set in red brickwork, which is the general wall facing, and at the angles are Ancaster stone quoins; the set-off of the plinth is also of Ancaster stone. The window-frames and cornice are of wood, and the windows filled with lead glazing in small squares; the roof is of Sandy tiles. There are chimney stacks at either end, and the whole is crowned by a turret covered with copper. It was found necessary to reface the end of the adjoining building, and in doing this the opportunity was taken of throwing an arch across between the two, over the gate to the joint right of way. The sign of the hall to Grammar School Walk shows five semicircular windows high up from the ground, framed in rough-cast up to the buttresses and the eaves of the hall roof. In this latter are two of the dormers referred to before, and in the centre of the building is the emergency exit porch. The length of the hall is flanked at one end by the projection of the office block, and at the other by that of the stage portion. The brackets of fibrous plaster over the window-heads in the hall have a modelled ornament of roses and lavender, a compliment to Hitchin products. The same device of roses and lavender is carried round the stage arch, but in the cornice above the more usual architectural decoration is employed. In the council chamber over the fireplace is a piece of plasterwork, executed by Mr. J. Pepper, and the lettering is based on some old tablets in the town. The iron fireplaces are from the excellent stock of Messrs. T. Elsley, Ltd., who are also the executants of the gas pendants, which were specially designed by Mr. Geoffry Lucas. The tiles to the fireplaces are of Dutch manufacture. The door fittings are in bronze metal. The building throughout is fitted with curtain blinds by Mr. W. Phillips, Hitchin, those in the front being of taffeta, and adding to the appearance of the windows. In the hall they are of green cotton rep, answering the purpose of excluding the light during any afternoon performances. The stage curtain and frontispiece is of red cotton plush. It is managed from one side of the stage. All the curtains are on brass rods.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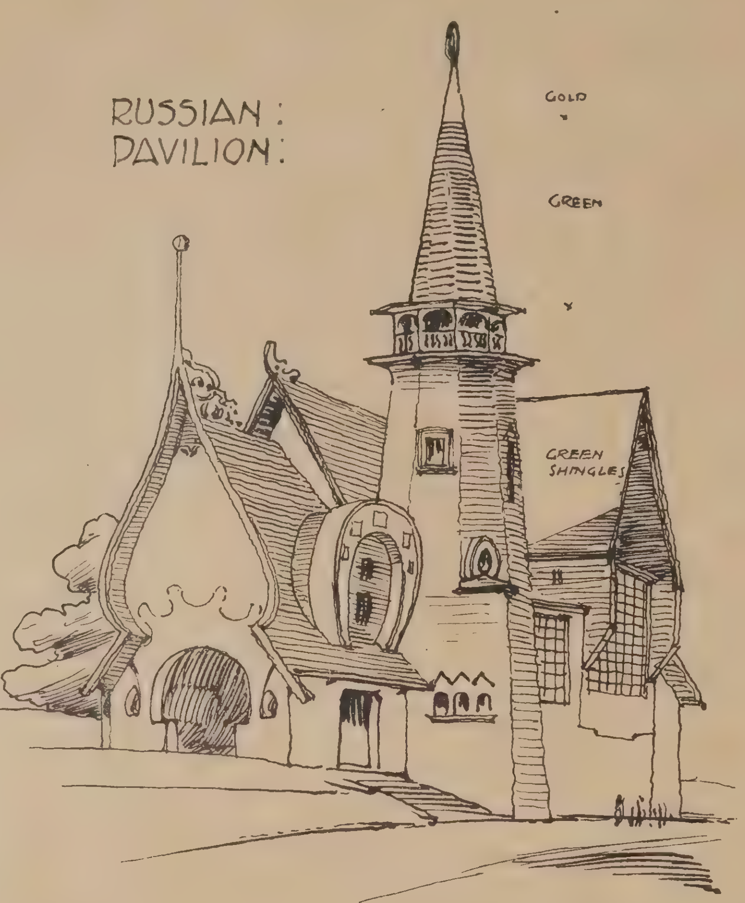
As to the seating, accommodation is provided as follows: The body of the hall provides for fifteen rows of twenty chairs each, and fifteen rows of benches, each with twenty-two seats. The gallery has six rows of benches, each providing twenty-four seats, and two smaller ones, giving a total capacity of 780 seats, exclusive of stage and standing room. The gangway across the hall in front of the stage is about 4ft. wide, and that at the back of the hall 4ft. 6in. There are alsoe gang two sidways 3ft. 6in. wide, and a narrow one down the centre. As ample room had been allowed in the above calculations it is quite possible that when necessary the building will easily accommodate 1,000 persons.



For the new building Mr. E. C. Pinks, of Messrs. Pinks & Watson, Westminster, was the quantity surveyor; and the joint architects were Mr. E. W. Mountford, F.R.I.B.A., London, and Mr. Geoffry Lucas, A.R.I.B.A., Hitchin. The cost of the building has been £5,800.

The following is a list of the various firms engaged in the building or from whom articles were obtained: General contractor, Mr. S. Redhouse, senior, Stotfold, Baldock Stone, The Lindley Quarries, Ancaster. Mason's work, Mr. James Pepper, Hitchin and Shefford. Bricks, Messrs. Plowman, Henlow. Steel roof trusses, Messrs. Drew, Bear, Perks & Co., London. Roof tiles, Mr. A. F. Love, Sandy, Beds. Plasterer, Mr. Thomas Walker, Arlesey. Gas-fittings and general ironmongery, Mr. George Redhouse, Baldock. Heating apparatus, Messrs. C. Kite & Co., London. Fire hydrants, Messrs. Merryweather, London. Stoves, rain-water heads, gas-pendants and brackets, Messrs. T. Elsey, Ltd., London. Ornamental plaster-work, Mr. Gilbert Seale, London. Iron casements, Messrs. Crittal & Co., Braintree. Plumbing, lead-glazing and glass domes, Messrs. Jenkins, London. Lavatory fittings, Messrs. J. Tylor & Sons, Ltd., London. Iron railings and chains for hall, Messrs. Gatward & Sons, Ltd., Hitchin. Tiles for fireplaces, Messrs. M. Van Straaten & Co., London. Speaking tubes, Messrs. Sheath Bros., London. Door furniture and panic bolts, Messrs. Charles Smith & Sons, Ltd., London and Birmingham. Glazing in yard, Messrs. Rendle & Co., Ltd., London. Asphalt for flats, Val de Travers Co., London. Gallery seats and fittings in cloak room, Mr. Joyner, Hitchin. Benches for hall, Mr. Taylor, Luton. Curtains throughout, Mr. F. W. Phillips, Hitchin. Incandescent gas by-pass supply, Mr. W. R. Phillips, Luton. Matting for hall and doormats, Mr. C. R. Burrows, Hitchin. Ditto for council chamber and dressing-room furniture, Messrs. W. Upchurch & Son, Hitchin. Council chamber tables, Messrs. P. H. Barker & Son, Hitchin.

Workmen's Dwellings for Hornsey.—The Hornsey District Council has purchased a further six acres of land adjoining their workmen's dwellings at a low rate, and this is to be utilised for the erection of more dwellings for the working classes.

EASTBOURNE PIER.

A NEW PAVILION is being erected on the pier at Eastbourne. From the summit of its central dome a view can be obtained of the majestic Downs to the westward. The dome is divided into two storeys, the upper one being intended for a camera obscura. The lower floor will be let as an observatory, museum (in miniature) or mutoscope exhibition. The dome is to be brilliantly illuminated at night by incandescent electric lights. The exterior of the dome and the other roofing is covered by zinc tiles. The contractor is Mr. Grace. The floor (about 10ft. wide) of the balcony running round the building at a height of several feet above the deck is of asphalt. The installation of the electric light is costing £1,000; and in addition there are a number of gas lamps on the balcony and elsewhere. These will be available in the event of any breakdown of the electric light supply. Ample provision has been made in respect of emergency exits, by which when thrown open the audience will be able to make their way out in a few minutes. There is to be accommodation for some thirteen hundred people. In the auditorium (on the ground floor) there will be seven rows of stalls and eleven rows of chairs. These will be tip-up theatre seats, and they will be upholstered in red plush. Upstairs the wide balconies will have four rows of seats, and there will be ample space at the back for a promenade or smoking lounge. The proscenium has been constructed of a composition into which plaster-of-Paris enters largely, and the prevailing colours are white and gold. The front of the balconies will be ornamented with designs illustrative of music and the drama. Outside the inner balcony, directly facing the stage, there will be a bar, with two tea-rooms adjoining it; and the principal bar downstairs will have walnut fittings, and will be on the western side of the building. Lavatory accommodation for ladies and gentlemen has been provided, Jennings' latest sanitary fittings having been used. The dressing boxes for bathers will accommodate a number of swimmers. Some rooms to let as shops form part of the pavilion. There is also a room for the directors.

AN INCIDENT OF THE PARIS EXHIBITION.

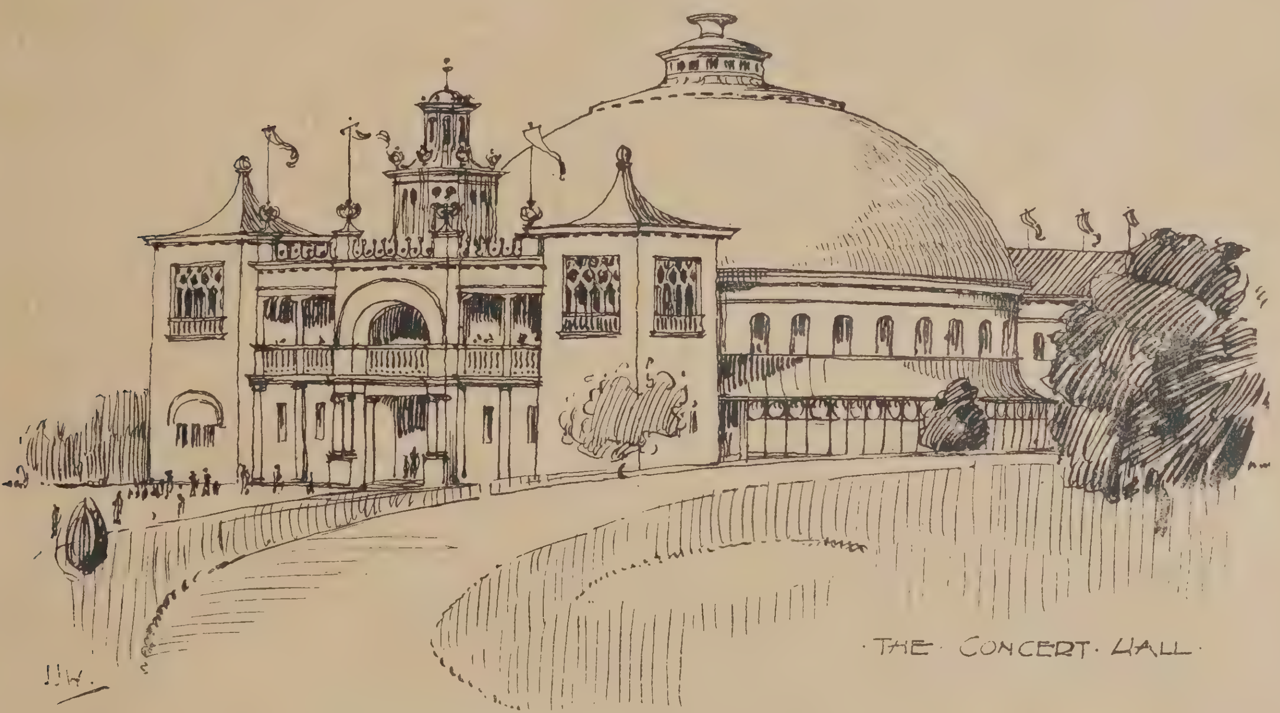
IN their report respecting the exhibit of Great Britain at the Paris Exhibition of 1900, presented to the King, the Commissioners state that one of their greatest difficulties—one, indeed, which threatened to become acute—arose in connection with the representation of the Colonies and India. It was part of the French scheme that colonies and dependencies should not show in the main buildings, but should erect pavilions at their own expense in the Trocadéro Garden. More than half the space was reserved for the French dependencies, and there were so many foreign claimants for the remainder that the Commissioners were only able to obtain an area of 58,884 sq. ft., which, according to the plans, yielded 36,000 sq. ft. of exhibiting space. This was so inadequate that many of the Colonies declined to exhibit, and the colonial representation was confined to Canada, Ceylon, Western Australia and Mauritius, which shared the space with India. No conditions had been attached to the allotment in the Trocadéro Garden, except that the larger trees should not be disturbed, and the Commissioners assumed that they were at liberty to use it to the best advantage. Designs for buildings were accordingly prepared by the Indian and Colonial Committees, and were submitted to the administration for their approval; but, to the Commissioners' surprise, these designs, the fruit of much time and labour, were rejected on the plea that they were out of harmony with the ideas of the administration, since the buildings were pronounced to be too high and to occupy too much of the ground. The Commissioners found themselves confronted on the one hand with the refusal of the French authorities to authorise the execution of the plans, and, on the other, with the refusal of the Colonies to submit to any reduction in their space. It was, in fact, an *impasse* from which there was no apparent escape, and there was reason to fear that the Colonies would withdraw altogether from participation in the Exhibition. Such a lamentable result was, however, averted, and by the joint efforts of Sir Edmund Monson, Her Majesty's Ambassador, and others, a compromise was arrived at by which the French authorities agreed to increase the space, in consideration of the designs being altered to meet their views. Fresh plans, which were accordingly prepared, were accepted, and a very troublesome incident closed with nothing worse than the loss of seven and a half months of valuable time.

LEICESTER AND LEICESTERSHIRE SOCIETY OF ARCHITECTS.

THE twenty-eighth annual report, of which we have received a copy, states that the membership now numbers 100, being an increase of fourteen since the last report was issued, while the statement of accounts shows a balance carried forward of £148 1s. 1d. The late Bishop of London (Dr. Creighton) and the late Mr. Joseph Goddard, F.R.I.B.A., were members of the society. In December last a communication was received from the Leicester Master Builders' Association asking the Council to receive a deputation to discuss certain matters affecting contracts and quantities. This was agreed to, with the result that the Council now make the following recommendations: (1) That where contractors are invited to tender, the lowest tender should be accepted. (2) That a clause be included in the quantities to provide for insuring workmen against accidents in a similar way that insurance against damage by fire is included. (3) That payments be made in the following manner: 80 per cent. of work executed during course of erection, 10 per cent. of the remaining 20 per cent. on completion of the work, 5 per cent. of the remaining 10 per cent. at the expiration of half the period of maintenance, and the remaining 5 per cent. final payment. That the accounts be settled within a reasonable period after the final accounts have been deposited with the architect by the contractor. (4) That on all large contracts an item be included in the quantities for damage that may be caused by excessive carting to the highways outside the Leicester borough boundaries. (5) That it is but fair to contractors the schedule of prices should be held by architects as a private and confidential document, and due care be taken that the contents are kept secret for all time. (6) That with regard to prime costs the Council cannot advise the inclusion of a specified profit, but suggest that the words "and builder's profit" follow as a separate item after every prime cost sum.

It has been decided to offer the sum of five guineas for the encouragement of the study of architecture at the Leicester School of Art, the prize to be awarded to the student who does the most meritorious work at the school during the winter session 1901–1902. The prize is to be spent in an architectural sketching tour of not less than ten days' duration. The Committee retain the power to withhold the £5 5s. in case the sketches are not considered satisfactory.

The report is illustrated by three drawings of old buildings in Leicester by Mr. John Fulleylove, R.I., honorary member of the society, and by a drawing of the south aisle of Gaddesby Church from the pen of Mr. A. H. Hind, a good specimen of fourteenth-century work.



·THE· CONCERT· HALL·

HULL'S NEW COMMERCIAL EXCHANGE.

THE new Pacific Commercial Exchange, Ltd., in High Street, has been built to the architectural design of Mr. B. S. Jacobs, of Hull, on the lines of the Great Baltic Exchange in London. The entrance to the new 'change faces Bishop Lane and is vis-a-vis to the entrance of the Hull Exchange. To the right, on entering, is found a spacious waiting hall and staircase, the former having an oak floor and high oak panels around the walls. The staircase, which is covered with thick Anglo-Turkish carpet, is also constructed of oak, with mahogany handrail and newels. Passing through the swing doors on the ground floor the main hall is entered. This is a lofty room 64ft. long and 41ft. wide, with aisles on either side, in which are tables of mahogany with beaten copper tops and chairs. The walls are in light terra-cotta and white, and the columns, which have white panelled outer covers, stand on hard brick pillars driven 28ft. in the ground. The room is lighted by a powerful installation of electric light, fixed on electroliers of beaten copper and wrought-iron. The hall is aired by a couple of electric fans, and heated by low-pressure steam-radiators. Above the entrance doors is a balcony. At each end of the hall are deeply-recessed chimneypieces and fireplaces. On the left of the entrance is the hall porter's lobby, and on the right the members' writing-room, furnished on an elaborate scale, with bookcase, writing desks, &c. At the far end are the lavatories, serving-room and telephone-room, the latter containing six telephone boxes—two trunk wires and four locals. Above these is a mezzanine floor comprising larders, store-room and serving-room, beer and wine cellar and cigar-room. Up the staircase is the lounge—an elongated room 32ft. by 17ft., furnished and carpeted luxuriously at considerable cost. This has communication direct with the restaurant, 42ft. by 27ft., which is entered by Classic swing doors, with bevelled plate-glass panels. The ceiling of the restaurant is carved and deeply panelled and enriched. At the far end of the board-room are two cross ventilated serving corridors leading to the kitchens and serving-rooms. The kitchens are fitted with a special Eagle range, gas grilles and cookers and hot water, hot plates, &c. Above the kitchens are the caretaker's rooms, and above the lounge is the board-room and lavatories. Beyond the kitchens and at the same level is a servants' hall, steward's office and knife-room, &c. The new exchange has been erected by Mr. Walker Sanderson, contractor, Hull. The sub-contractors were Messrs. M. J. Peers (mason), R. H. Kenningham (plumber), Messrs. Dawber, Townsley & Co. (slaters) and Messrs. Dreyer & Co. (painters and decorators). Messrs. King & Co. were responsible for the electric lighting installation, electro wares, electric bells, grates and the cooking arrangements. The special hammered iron and copper electric-light fixings and wrought-iron palisading were supplied by Messrs. Norman & Ernest Spittle, of Birmingham, and the low-pressure steam heating radiators and electric ventilating fans by Messrs. Ashwell and Nesbit, London; the mahogany and other chimneypieces by Messrs. Lackenby, and the glass and china services by Mr. J. J. Bernard. The whole of the furnishing was done by Messrs. Bladon & Co., of the Bon Marche, Prospect Street, Hull.

A New Home of Rest, at Rostrevor, has been erected in connection with the work of the Girls' Friendly Society in Ireland. The site is in one of the best positions on Carlingford Bay. Mr. W. J. Watson, F.R.I.A., was the architect.

A NEW INSTITUTE IN WALWORTH.

THE new buildings in Larcom Street, Walworth, for St. John's Institute, erected through the munificence of Mr. Arthur Lloyd, of the "Daily Chronicle," have just been completed. There are four floors and a basement in the building, every foot of space being utilised. In the basement is the store for furniture required for concerts or lectures, as well as the heating chamber and apparatus. On the ground floor there are the men's gymnasium, the boys' gymnasium, and boys' reading-room, with a spacious entrance hall and fireplace. On the mezzanine floor is the gallery to the large gymnasium, to be used as a dressing-room, with shower-bath, lavatories and secretary's gallery attached. The first floor contains a meeting-room for allied clubs, a reading and writing room, and a large billiard-room fitted with two full-size tables. On the second floor are twelve cubicles 10ft. long by 5ft. wide for resident members, each being lighted by a separate window, a bathroom, and separate shower bath, with a range of lavatories, store-room, box-room, &c., and a dining-room. The kitchen and caretaker's rooms are placed in the attics. There is a lift serving all the floors, and hot and cold water is laid on to the sinks and lavatories on each floor. The furniture, which has also been given by Mr. Lloyd, is made in oak from designs prepared by the architects, Messrs. Dunn & Watson, of 35, Lincoln's Inn Fields, W.C. All the rooms and passages are lighted by electric light. The building has a frontage to Larcom Street of about 66ft., and the front wall is faced with salt-glazed bricks of a warm colour up to the gymnasium windows, over which there are fine balconies projecting from the billiard-room floor, shaped and moulded and enclosed with wrought-iron railings. Above this the walls are faced with yellow stocks with stone dressings. The entrance doorway has been treated so as to include the mezzanine and first-floor windows immediately above it, having pillars with carved corbels and carved cornice, finished at the top with a shaped and moulded head enclosing the arms of the Institute. The contractor was Mr. John Marsland, York Street, Walworth.

M. Felix Charpentier, the famous sculptor, was awarded a *grand prix* for his work at the Paris International Exhibition, and has recently been promoted to the rank of officer of the Legion of Honour.

A NEW BOARD SCHOOL FOR ST. ALBANS.

THE St. Albans School Board have just provided another school for boys on a site in the south-eastern portion of the city, comprising 1,860 sq. yds., or a little over one-third of an acre, in the Old London Road, near the new and growing neighbourhood of Priory Park, which has given its name to the schools. The site is at the end of the road nearest the town, and is situated about 275ft. above the sea-level, so that it is well away from the river. It has a frontage to the Old London Road of 105ft. and an average depth of 160ft. The school can accommodate 200 boys, and is so planned as to be capable of expansion so as to accommodate 300 without substantial alteration. The lighting in each case is from the left side. With a view to maintaining accurate levels, the school building has its length from north to south, thus presenting a short side only to the road, avoiding the inconvenience which would have been caused by reason of the decided decline of the ground from west to east. The building therefore stands along the top of the slope of the site, and additional advantages are thereby secured. The windows cannot be injured by buildings on adjoining sites, and they are so placed that every room gets the sun.

According to the good rule now sanctioned by the Education Department, the glass of the main windows is brought fairly near to the floor. The size of the windows has been determined by calculation so as to bear a fixed liberal relation to the floor area. A space is left on the west of the building for drainage, command of the roofs, &c. The size of the site will allow a little more than the minimum of space permitted by the Department when 300 boys are provided for. In the school, as now built, there is a schoolroom for 100, hereafter to be divided by a sliding partition, into two classrooms, each for fifty, and two classrooms for infants. The precaution has been taken to build the lobbies, cloak-rooms, &c., of the size that will be required for 300 scholars, so that enlargement in this portion of the buildings will be unnecessary to complete the school. The storeroom of the larger school is to be used as a masters' room for a time before the permanent masters' room is built.

The walls of the buildings are carried out in local red bricks. and the roofs are covered with Woburn red plain tiles. In the oak bell-turret is hung the bell from the house at Colney Park, which was sold when the old mansion was pulled down, and was acquired for this school. The floors in the passages are of Stuart's granolithic, and the rest of the floors are of pitch-pine blocks, of Duffy's Acme, D quality, laid herring-bone fashion in composition on a concrete bed. The heating is by Shorland's stoves. Fresh cold air is admitted by numerous Tobin tubes, some of large size, and the used air finds its way into the roof space and goes out at the gables, and by special ventilation flues arranged in the chimney-stacks.

The floors of the classrooms are in steps, so as to give the teacher a command of the boys, and also to enable the boys to see the blackboards and their teachers without effort. Where dual desks are used there are two on the floor of the classroom and three on the raised steps—five rows in all—the rooms being 22ft. wide where narrowest. Twenty inches of space is arranged for each desk, and passages 16in. wide are left between them. The desks used throughout the school were made by the Educational Supply Association.

The plans for these schools have been prepared by Messrs. Clarkson, architects, of Bricket Road, St. Albans, who have now completed four school buildings for the Board, or five if the Alma Road Infants' and Girls' Schools are counted as two. Messrs. Whibley & Jervis, of Alma Road, St. Albans, were the builders. Their contract was for £2,700. Mr. H. Tanner, of Sandridge Road, was clerk of the works. The lavatories and other sanitary appliances are from Messrs. Adams, of Leeds. The whole of the building is lighted by gas, the fittings having been supplied by the firm of Messrs. Strode & Co., while the blinds have been fitted by Messrs. W. Page & Son, of St. Peter's Street, St. Albans.

OBITUARY.

THE LATE MR. ARTHUR CATES.

THE death took place, at his residence, 12, York Terrace, Regent's Park, on Wednesday last, of Mr. Arthur Cates, the well-known architect, formerly of 7, Whitehall Yard. After leaving King's College School, Mr. Cates became a pupil of Mr. Sydney Smirke, R.A., and afterwards confidential assistant to Sir James Pennethorne. In 1859 he entered upon general practice as an architect, and continued in the active pursuit of his profession until 1898, when he retired. As an architect he acted for the Inner Temple and other public bodies and estates, and from 1870 till his retirement he was architectural adviser to the Commissioners of Woods and Forests for the Crown estates in London. From an early period of his career he was largely engaged as a referee and arbitrator in cases arising out of building and property disputes; and in later years his experience and authority in this branch of professional work were recognised by his appointment as chairman of the Tribunal of Appeal under the Acts of 1890 and 1893 and the London Building Act of 1894. Mr. Cates gave a large amount of time and attention to the affairs of the societies connected with his profession. He was for many years a member of council, and for four years vice-president, of the Royal Institute of British Architects, secretary to the Society of British Archæology, a vice-president in 1891 of the Biblical Archæological Association, chairman of the board of examiners in architecture from 1880 to 1896, and hon. secretary to the Architectural Publication Society. While holding the last-mentioned office Mr. Cates completed the production of the Dictionary of Architecture, at a cost of over £10,000. Besides his contributions to the work named and to the Dictionary of National Biography, Mr. Cates was the author of numerous communications to professional journals in support of his efforts to improve architectural education and to promote the establishment of professional examinations, in which he was ultimately successful. He was seventy-two years of age, and was buried on Saturday last.

THE LATE MR. ARTHUR CATES.

At Melksham Parish Church, in connection with the restoration, a figure of St. Michael has been erected in the niche over the north door. The figure is of Painswick stone, and was carved and fixed by Messrs. Harry Hems & Sons, the well-known sculptors of Exeter.

Coley Church, one of the oldest edifices in the parish of Halifax, is undergoing restoration. The alterations in progress include an enlargement of the chancel by the absorption of the old vestries, the provision of new vestries and the re-pewing of the church. The improvements are estimated to cost £2,000.

New Patents.

These patents are open to opposition until June 24th.

1900.—White Lead.—8,820. E. R. Blundstone, 14, Great Smith Street, Westminster, S.W. The process consists in making an alkaline solution of litharge in lactic acid or lead lactate and precipitating white lead from the solution by means of carbonic acid. One advantage is that the process can be carried out in the cold.

Urinals.—11,084. T. W. Twyford, Cliffe Vale Pottery, Hanley, Staffs. The body of the urinal is constructed in the ordinary manner, but the curved back is provided at the top with a continuous channel, covered by the eave depending from the coping. This channel is fed by a service pipe, and when full the water overflows down the back of the urinal in a thin unbroken stream. The use of sparge pipes is thus avoided. A second part of the invention, however, relates to the connection between a sparge pipe and the water-supply by a two-part fitting which allows the sparge pipe to be detached without disturbing any other part of the urinal.

Water Fittings.—11,087. T. W. Twyford, as above. This invention relates to a water-shunt valve for controlling the flow from a single source of supply to two different parts. The body is quadrant-shaped, and contains a wedge-like valve operated by an outside lever.

Brackets for Cisterns, Basins, &c.—11,146. T. W. Twyford, as above. The bracket is made of fireclay, but encloses an iron arm or rod which is built into the wall.

Lifting Apparatus.—19,288. M. Green, 25, Wakehurst Road, New Wandsworth, S.W. This invention, the object of which is to facilitate the raising of heavy lamp columns, pillars, &c., consists in combining a shear legs with a pair of wheels.

The following specifications were published on Saturday last, and are open to opposition until July 1st. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—3,559, Judge & Garrett, self-closing taps for valves. 7,406, Trier, machinery for surfacing, moulding and turning stone. 7,463, Spray, mantelpieces. 7,690, Carstensen, braces or drills. 7,815, Thom & McCall, windows. 7,834, Cameron, Commin & Martin, automatic apparatus for regulating the working of sewage filters. 9,799, Aveyard, Coveney & Coveney, locks or latches. 10,320, Jones, stone-dressing machines. 10,426, Garside, Carter & Hydraulic Engineering Co., electric safety appliances for lifts. 10,440, Whitton, window frames. 10,714, Read, drain pipes, &c. 11,321, White, apparatus for opening and closing windows, fanlights, &c. 11,376, Chandler, bricks, tiles, &c. 11,403, Dobbie, manufacture and fixing of tiles to walls, ceilings, &c. 11,543, Dennis, metallic hearth-plates. 11,569, Pullan & Mann, brick-moulding machinery. 11,632, Adams, sewage screens. 11,693, Cadman, tops for ventilating shafts. 11,696, McIntyre, automatic fire shutter. 13,755, Müller, siphon-flushing cisterns and fittings. 18,400, Woods, wall, ceiling and other tiles. 18,401, Woods, damp-courses. 20,639, Dunkelberg, manufacture of artificial stone.

1901.—2,446, Haerst, street-sweeper and scraper. 3,116, Haddan (*Sparrow*), joints for window-blind rollers. 3,788, Forster, vices. 5,157, Jumeau, ornamental panels for glazed windows. 5,319, Campbell, sash pulleys. 5,534, Lübbert, locks. 5,584, Boult (*Ledermann*), securing handles to door-locks, &c. 5,756, Price, iron inspection and manhole chambers for drains and sewers. 5,815, Brice, building bricks or blocks.

A New Theatre at York.—The plans for the new theatre in Clifford Street, York, on the site of the Corn Exchange, prepared by Mr. John P. Briggs, of Effingham House, Arundel Street, Strand, W.C., have been approved by the City Council.

SETTING OUT LAND.

By G. A. T. MIDDLETON.

A SURVEYOR is as frequently called upon to set out the lines of new roads, railways, canals, &c., on the land according to a predetermined plan, as he is to make a survey and plot the result. One operation is but the converse of the other, and yet it is more difficult to set out than to survey accurately.

As in surveying, it is possible to work entirely with the chain so long as the ground is fairly open and fairly level, but a theodolite or some other angle-measuring instrument becomes a necessity (if accuracy is to be secured) if there be many or serious obstructions, or if the ground be hilly.

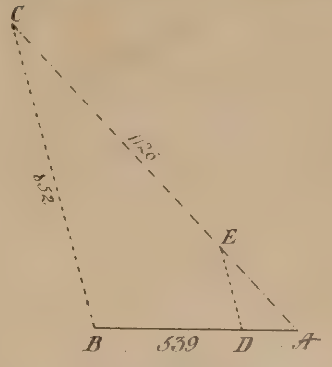
Usually the main points and centre lines are laid down first, their positions having been previously determined on the plan, and strong stakes being driven in where they occur; and it is well to use stakes which are distinctively coloured and numbered or lettered. Thus, bright red, blue and white stakes are admissible on grass land, one colour being kept for, say, junctions of centre lines, another for intermediate points on centre lines, and another for boundary lines of roads, while possibly even a fourth colour may be needed for boundary lines of building plots. As each stake is driven, it should be numbered or lettered, and its position on the plan similarly indicated.

Of the various problems which confront a surveyor when engaged in setting out, one of the easiest and most common is that of joining two ascertained points by a straight line. So long as the line is a short one, on evenly rising or falling ground and without obstructions, this can be done by erecting poles at each of the extremes and "boning" between them; that is, setting up a series of intermediate poles by sighting from one to the other. Simple as this seems, however, work done in this way is rarely accurate, for poles are not always held vertically, and land is rarely level; and a very slight hill or depression between the two extremities will introduce an element of probable inaccuracy.

If it be possible to see the foot of one pole from the other, it is best to erect a theodolite over this other, direct it towards the foot of the first pole where it is seen to enter the ground, level and clamp the horizontal limb, adjust with the horizontal tangent (whether main or vernier tangent does not matter), and then, allowing the vertical limb to swing, fix intermediate points one after another with the cross hairs.

If, however, there be rising ground between the two points, so that only the top of a long pole erected at the first station can be seen from the theodolite placed over the second, this pole top, swinging about in the wind, cannot be depended upon for accurately determining the point at its foot. In such a case a single intermediate station should be determined with the theodolite as nearly as may be in the true line and on the brow of the hill, and the theodolite should be shifted and erected over this new station. On being levelled, the cross hairs should first be directed on to the first station, and then the telescope swung right over vertically, if it be a traverse instrument, or the vernier plate revolved 180 degs. if it be a plain theodolite; when the hairs ought to exactly cover the second station. If not, as is probable, the instrument will have to be slightly moved to right or left until the correct position be found; and as the correction is generally a small one, an instrument having a sliding base plate is a convenient one to use. Once the position on the brow of the hill has been found, other intermediates are readily laid down accurately from it as before, by observations with the vertically swinging telescope.

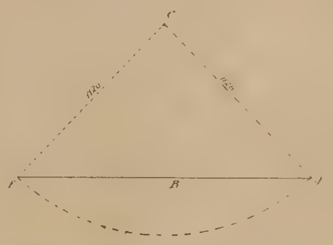
But more often than not it is impossible with a line of any considerable length, to see one extremity of it from the other extremity, and it becomes necessary to set out accurately the angle which this line makes with some previously determined line. This can be done, though with only approximate accuracy, by proportional measurements, as shown in the accompanying illustration, where it is assumed that a line A C has to be set out, the line A B being known. It is found by scaling that A C = 1126 links, A B = 539 links, and B C = 852 links. If each of these be divided by the same number, the sides of a small triangle proportional to A B C in every respect, and having the same angles, will be found. If a division of 20 be used, the proportional sides become 56·3, 26·95 and 42·6 links respectively. Lay down from A to D a length of 26·95 links. (Note that the diagram is only a diagram and not to scale, and that it would be very difficult on ordinary land to measure a distance accurately to so small a fraction of a link). Now, if 56·3 and 42·6 links be summed, it will be found that a line 98·9 links in length, with its extremities held at A and D, and with a point distant 56·3 links from A drawn out taut, will form the two lines A E and E D on the ground.



SETTING OUT AN ANGLE BY PROPORTIONAL MEASUREMENTS.

A E should, theoretically, give the direction of the line A C; but the accuracy of work done on this principle is very questionable indeed. A small error of some sort is sure to occur, even with the exercise of the utmost care, and if the line A E be not laid down in *exactly* the right direction, the point C will be missed on its prolongation.

It is much better to determine the angle C A B, and to lay this out with the aid of the theodolite. The angle is most readily found by striking a segment of a circle from the centre C on plan at the distance C A till the line A B is again met at F. Then half the chord A F (which can be ascertained by scaling), divided by 1126 (the length of A C), is the cosine of the angle C A B. In other words,



DETERMINATION OF ANGLE C A B.

$$\cos CAB = \frac{AF}{2} \div 1126$$

and therefore, $L \cos CAB - 10 = \log. \frac{AF}{2} - \log. 1126.$

From either of these equations it is easy to find the angle C A B, by using the tables of natural or of logarithmic cosines respectively.

The old Red Hall at Bourne, Lincolnshire, where the Gunpowder Plot was hatched, is threatened with destruction. The hall is the property of the Great Northern Railway Company, and is now used as the railway station-master's house. But the company are intending to pull it down unless some arrangement can be made to prevent its destruction, which, from an archæological point of view, would be a great loss to the county. The British Archæological Society are interesting themselves in the matter, and have approached the Kesteven County Council on the subject, but without result. Some time ago the company proposed to demolish the old Red Hall, but refrained from doing so on a petition from the inhabitants of Bourne.

Law Cases.

Architects' Fees.—The case of *Paget* v. *Dollar* was heard in the King's Bench Division of the High Court of Justice recently. This was a claim to recover damages for negligence, which was denied. Mr. Walton stated that in March, 1897, the plaintiff, Major Paget, who is now in South Africa, employed the defendant, an architect, to prepare plans for certain flats at Church Row, Hampstead. The plans were prepared, and a tender was accepted in March, 1898, for erecting the flats. The defendant then requested an increase in his fees, which was refused. It was then agreed that the defendant should hand over the plans for the sum of £504, then paid to him, and withdraw from the work. It was assumed and understood by the plaintiff that the necessary consent of the County Council had been obtained. It transpired that this was not so. The building line was found to be in advance of the general building line of the street, and to a large extent new plans had to be prepared before the consent of the Council could be obtained. This caused additional expense and a delay of several months. The defendant should first have obtained the consent of the Council, and not merely the district architect's approval. For the defence a large number of eminent architects were called. They stated that the defendant had followed the usual custom, and had done all that prudence would suggest; it was not always wise to anticipate the Council's objections. Mr. Justice Wright gave judgment for the defendant, with costs.

Negligence in Making Valuation.—On May 10th Mr. Justice Bruce delivered judgment in the King's Bench Division of the High Court of Justice in the case of *Harding* v. *Ewing* (reported on page 284 of our last issue). This was an action brought by Mr. Solomon Harding, secretary to a building society at Chester, against Mr. Charles Anthony Ewing, architect and surveyor, also of Chester, to recover damages for alleged negligence in making a valuation of four houses in Ailsa Road, Liscard, near Birkenhead. After reviewing the evidence his Lordship gave judgment for the plaintiff for £427 4s. 8d., with costs.

Agreements restraining Architects from Practising: A Curious Case.—In the Chancery Division of the High Court of Justice last week a motion in *Portsmouth* v. *Seward* came on for hearing. The plaintiff asked by his motion that the defendant, Edwin Seward, might be restrained from practising as an architect and surveyor, and from opening or encouraging any person to open an office for carrying on the practice of an architect and surveyor, in Swansea. It was stated in support of the plaintiff's case that, notwithstanding his undertaking, the defendant had, on the invitation of the Swansea Harbour Trustees, sent in plans, which had been accepted, for the erection of new offices at Swansea, and that he had accepted the position of architect for the new offices. This, the plaintiff's counsel contended, was practising in Swansea, and was in contravention of an agreement which had been entered into between him and the plaintiff. Defendant's counsel urged that there had been no breach of agreement, and that the defendant had simply, in answer to an advertisement by the Swansea Harbour Trustees, sent in his plans, which had been accepted, and that he was entitled to act as architect of the buildings in question, because by the agreement he had reserved his right to act in Swansea whenever called upon or specially invited to do so. Mr. Justice Kekewich held that the fact of entering the competition, and the preparation of the plans, was no breach of the agreement, and that Mr. Seward was entitled to this much; but he decided that if Mr. Seward superintended the erection of the buildings he would be practising in Swansea, and that he should be restrained from doing so. The injunction was suspended pending appeal.

A Stone-sawyer's Claim.—The case of *Perry* v. *Clements* was heard last week in the King's Bench Division of the High Court of Justice. Plaintiff was a stone-sawyer in the employ of Messrs. Jones Brothers, builders. On March 12th last year he was working on some ground in the neighbourhood of Addison Road, Kensington, where his employers were erecting some large flats. The defendant was a contractor at Hammersmith, and his carts came from time to time to the yard to shoot some material which was used in the mortar. On the day in question one of the defendant's carts having entered the yard and shot its contents, the carman began whipping up the horse, and the plaintiff, who was standing by, said, "If you continue to do that we shall have an accident." The driver, however, took no notice, with the result that the cart struck against a large slab of stone which weighed 15 cwt., and knocked it over upon the plaintiff. He was seriously injured, both his legs being broken, and he remained in the West London Hospital for fourteen weeks, and even now could only walk with the aid of a stick. The defence was that the carman was not really in the employ of the defendant when the accident happened, and that therefore he was not liable. The jury found that there was negligence on the part of the carman, who at the time of the accident was in the defendant's employ, and they gave a verdict for the plaintiff for £225.

Alterations at Gaddesby Hall: The Architect's Account.—The case of *West* v. *Barclay* was heard last week in the King's Bench Division of the High Court. The plaintiff is an architect practising in the West End of London, and the defendant a private gentleman of considerable means, who employed the plaintiff in connection with some works at Gaddesby Hall, Leicestershire. The action was brought to recover remuneration for professional work done in and about the estate. The work, which lasted from June, 1898, to October, 1899, about fifteen months, consisted in building a new wing, new stabling, repairs and alterations to the house, &c., and ultimately the cost came to over £14,000. The question was what was the fair remuneration to be paid to the architect under the special circumstances of the case, because it was not the ordinary case of an architect superintending the work for an employer where a builder was employed. Here was what gave rise to the difficulty. The dispute was whether plaintiff was to be limited to the ordinary charge of 5 per cent., or whether he was justified in making an extra charge of 5 per cent. considering the extraordinary nature of the work he did. If only 5 per cent. were allowed, then there were other expenses which would be due for out-of-pocket and travelling expenses, &c., and which defendant did not dispute; but if 10 per cent. were allowed, the question might arise whether that would not cover all expenses. The plaintiff's claim was that he was entitled to 10 per cent., on the ground that he had an agreement with the defendant by which he was to keep and pass the accounts, and to act as builder and contractor as well as architect, and the value of these additional services he put at 5 per cent. The defendant admitted that there was such an agreement, but alleged that 5 per cent. was sufficient to cover the plaintiff's services in every respect. Two architects of experience gave evidence for the defendant that the plaintiff's services would be fairly remunerated at 5 per cent. on the total outlay. Mr. Gruning, vice-president of the Royal Institute of British Architects, said he thought plaintiff had not done enough to entitle him to 10 per cent.; 5 per cent. all round would be the proper remuneration. His Lordship (Justice Kennedy) said a great deal of annoyance and inconvenience would have been saved if both parties at the outset here had put down their bargain in black and white and in plain language. It seemed to him that the plaintiff's claim as a whole was untenable, but he had come to the conclusion that the work as done was more onerous, both in point of responsibility and in the actual labour, than the usual course taken by architects working on the ordinary 5 per cent. scale. He thought plaintiff was clearly entitled to something over 5 per cent., and, taking everything into consideration, he held that plaintiff was entitled to 7½ per cent., with the exception of certain specified small items, and in addition he was entitled to certain expenses which were admitted. Judgment was entered for the plaintiff on the claim for £1,150, with costs, and for the defendant on the counter-claim for £107, with costs.

The New Bridge at Vauxhall.—An appeal case was heard before the Lord Chief Justice on Friday last in which the plaintiffs were Messrs. Pethick Brothers, builders and contractors, who are engaged in building the new bridge across the Thames at Vauxhall. They brought the action to recover the damage which they had sustained through a collision between a barge in tow of the defendants' steam-tug "Frank" and one of the abutments of the new bridge, owing, as the plaintiffs alleged, to the negligent navigation of the defendants' tug. The court dismissed the appeal. The Lord Chief Justice said that, by statute, the plaintiffs were bound to have three openings, each 70ft. wide. The opening through which the tug tried to go was only 64ft. wide. He was unable to come to the conclusion that the narrowing of the waterway did not contribute to the collision. He was not sure that, if the waterway had been 6ft. wider, the barge would have struck the dolphin at all. The plaintiffs, therefore, could not recover. The Master of the Rolls and Lord Justice Romer delivered judgment to the same effect.

The "Tube" Vibration Again.—On Thursday last, at the Surveyors' Institution, Great George Street, S.W., Mr. Daniel Watney, sitting as sole arbitrator, heard the case of *Pearce* v. *Central London Railway Co.*, a claim for compensation in respect of certain damage to the vicarage of Christ Church, Newgate Street, alleged to have been caused by the construction of the new line. Mr. Richard Philip Day, diocesan surveyor for London and Canterbury, said that in 1895 the vicarage was put in thorough repair. In January, 1897, cracks appeared and developed rapidly. In his opinion these were due to subsidence caused by the pumping operation. The damage became so serious that at one time he was afraid the property would have to be condemned under the London Building Act. He estimated the cost of repair at £750. Mr. Mott, one of the engineers to the railway company, said he failed to see how the pumping operations could possibly affect the vicarage, as no gravel—only water—was abstracted. In his opinion the cracks already existed, and had been pointed over. Mr. Alexander R. Sterring expressed his opinion that the cracks were certainly not due to subsidence. The necessary repairs could be executed at a cost of £35. This view was supported by other witnesses. The arbitrator reserved his award.

HOME ARTS AND INDUSTRIES.

THE Home Arts and Industries Association held the annual exhibition of work done in its classes on Thursday, Friday, Saturday and Monday last in the Gallery of the Royal Albert Hall. This Association is doing excellent work in its endeavour to encourage arts and crafts in the village, and to prevent in some measure the wholesale removal of industries to manufacturing centres. It is lamentable that so many local crafts should have already died out under the stress of modern trade and social conditions, and therefore this worthy endeavour of the Association is deserving of every support. The exhibits were of a most complete character; they included wood-carving, cabinet work, inlaying, repoussé and wrought metal work, pottery, leather work, book-binding, baskets, hand-spun woollen and linen fabrics, lace, embroidery, tapestry, carpets. Mrs. G. F. Watts's classes at Compton and Aldourie showed examples of their excellent terra-cotta work, pottery and a wrought-iron gate. The Aldeburgh and British and Irish Spinning Weaving and Lace School classes showed some tapestry work, but were somewhat indicative of what this should not be, in the endeavour to obtain pictorial representation and elaborate designs; this treatment is not adapted to work that grows up on the loom, as it shows at once that a design has been carefully prearranged. At the Altrincham and Welbeck stalls wood-carving from designs by Mr. J. Phillips was especially noticeable. The Ascot class showed cabinet work, small tables, carved wooden picture frames and inlay. Wood-carving was also exhibited at the Southwold stall. Mr. Harold Rathbone's developed industry at Birkenhead had a large exhibit of Della Robbia pottery, and the Birmingham class showed some mats of rich and harmonious colour. The Keswick class showed good repoussé copper work, silver cups and copper pots. The other examples of repoussé work in the hall were too overstrained for effect, and were hard on the material. The Ruskin Linen Industry exhibited some beautiful examples of embroidered and worked altar cloths, &c. The Brabazon Employment Society are employing disabled soldiers and sailors profitably and pleasurably. It will be seen that architects and others engaged in church work and interior decoration should avail themselves largely of this Association in order to obtain craft work which is always interesting and often excellent.

Masters and Men.

A Strike of Bricklayers at York has occurred against an alteration of working rules proposed by the masters. Over 200 men are affected.

A Joiners' Strike at Teeside, that is, in Stockton, Thornaby, Middlesbrough and the Hartlepools, has occurred for an increase of wages from 9d. to 9½d. per hour. About 600 men are out.

A Strike at Nuneaton of the carpenters and joiners is in progress for an increase of ½d. per hour on the present rate of 8d. The masters have issued notices that the wages will be reduced to 7½d. per hour.

At the Penrhyn Slate Quarries all the mechanics have signed for the resumption of work, and it is expected that this week at least a thousand quarrymen will be at work. Last week eighteen officials, at the command of Lord Penrhyn, worked as quarrymen and labourers in the "Lady Gallery," the most profitable and easily worked.

The Strike of Swansea Builders' Labourers for an extra ½d. per hour is gradually affecting the whole of the building trade. The carpenters, joiners, plumbers, painters, plasterers, &c. associated with the Federated Trades have decided to cease work in the event of the demand not being conceded. Between 300 and 400 men will be affected by this decision. The hauliers have decided to come out at once, and some thirty men belonging to the Stonemasons' Union ceased work some days ago.

Wages in Australia.—In Australia, as in older countries, skilled labour usually commands a maximum wage, its value being enhanced by the general adoption of the eight-hour system in most of the various branches of industrial activity. In New South Wales the average rates per week enjoyed in the engineering trades are as follows: Bench hands, 41s. 6d.; blacksmiths, 55s. 6d.; brass-finishers, 45s.; brass-finishers' foremen, 80s.; coppersmiths, 49s. 6d.; engineers, 54s. 3d.; fitters and turners, 53s. 6d.; frame-saw hands, 43s.; labourers, 35s.; machinists, 46s.; moulders, 52s. 9d.; painters, 44s.; pattern-makers, 59s. In the ornamental zinc manufacture the rates are: Blacksmiths, 48s. to 54s.; brass finishers, 50s. to 60s.; metal workers, 48s. to 78s.; zinc moulders, 20s. to 44s.; foremen, 80s. to 100s. In other metal works general hands obtain from 42s. to 50s.; machinists, from 40s. to 50s.; and scale makers, from 20s. to 50s. In other trades the rates are: Gas-fitters, 25s. to 60s.; galvanised iron workers, 42s. to 54s.; plumbers, 35s. to 85s. 6d.; oven makers, 40s. to 50s.; stove makers and fitters, 30s. to 72s. In hydraulic engineering blacksmiths get from 42s. to 63s.; draftsmen, 60s. to 90s.; fitters, 54s. to 62s.; hammer men, 40s.; pattern makers, 60s. to 63s.; and turners, from 48s. to 60s. In lead mills the rates are: Moulders, 42s. to 60s.; millers, 42s. to 48s.; rollers, 25s. to 57s. 6d.; and foremen, 67s. 6d.

The Central School of Arts and Crafts.—The Technical Education Board of the London County Council will shortly submit for the approval of the Council a scheme for purchasing as a site for the erection of new buildings as a permanent home for the Central School of Arts and Crafts, at present existing at 316, Regent Street, certain premises acquired by the Council in connection with the Southampton Row widening at the corner of Orange Street and Southampton Row. It is also intended that accommodation shall be found on the site for the London County Council School of Photo-Engraving and Lithography, in the event of that school being unable to continue the tenancy of its present premises. The cost of the site is stated to be £45,000, which sum it is proposed shall be borrowed under the authority of the Technical Instruction Acts.

Builders' Notes.

A New Test for Portland Cement.—Mr. A. Patchett writes to correct an error in his communication under this heading on p. 269 of our issue for May 8th inst. For "grains" read "grammes."

Stables.—His Majesty's Office of Works have entrusted the St. Pancras Iron Works Co., Ltd., with the fitting up of the stables at the British Embassy in Paris. Among other stables which this old established firm have fitted this year are those of Lord Durham at Newmarket, The Countess of Lovelace, Sir Audley Neeld, Sir William Marling, The Hon. W. F. D. Smith, M.P., Mr. F. Layland Barrett, M.P., Mr. E. J. Stanley, M.P., and Mr. W. S. Cunard.

New Fire Prevention Testing Station.—The executive of the British Fire Prevention Committee announce that the opening of their new testing station at Westbourne Lodge, Bayswater, which had to be postponed on account of the illness of their chairman, Mr. Edwin O. Sachs, will now take place on Wednesday afternoon, the 22nd inst., when testing operations will be resumed and the issue of the Committee's reports, which have already reached an aggregate of sixty, will again be regularly proceeded with.

Hull Official Receiver and Speculative Builders.—A meeting of the creditors of Alfred John Wiles, 80, Newland Avenue, and Fred Hunter, 23, Reynoldson Street (trading as Wiles & Hunter, builders, De Grey Street, Hull), was held recently at Hull. The gross liabilities were stated at £6,988 14s. 7d., but the nett liabilities were put at £482 3s. 2d., and the assets at £469 18s. 7d., leaving a deficiency of £12s. 4s. 7d. The debtors attributed their insolvency to want of capital, too much on hand at once and high prices of materials and labour. The Official Receiver (Mr. Maples), who had obtained an order for a summary administration of the estate, said that most of the properties had three charges upon them, and it was doubtful whether there would be any surplus whatever. Things were getting to such a pitch with speculative builders that he did not know how they managed to get any credit at all. Things were getting worse and worse, and something would have to be done. He thought the matter should be taken up by the Chamber of Commerce or the Incorporated Trades Society.

A Year's Building in Leeds.—The report of the Leeds Building Inspector (Mr. W. Towers) for the twelve months ending March 25th last shows that the year was a busy one in the building trade. The total number of plans submitted to the Building Plans Committee was 2,849, or 65 more than last year, and the total number sanctioned was 2,199—an increase of 30. But the number of buildings shown on the approved plans, 8,952, was 487 less than in the preceding twelve months. Of these buildings 2,947 (on 531 plans) were houses, and 1,807 mills, warehouses, stables, sheds and workshops; 2,427 represented additions and alterations, and 1,771 conveniences. In the previous year there were 3,549 houses and 2,039 mills, warehouses, stables, sheds and workshops. The 2,947 houses for the building of which authority was given comprised 19 villas, 88 semi-detached villas, 812 through houses, and 2,028 back-to-back houses. The latter figure is less than in the preceding year, when 2,300 back-to-back houses were sanctioned. The number of through houses is smaller by 285, and semi-detached villas less by 45, while the number of new detached villas for whose construction authority has been given is just the same as last year. During the past year 3,030 houses, including 2,035 back-to-back houses and 907 through houses) were completed and certified for occupation, a decrease of 29; while 1,591 miscellaneous buildings (including churches, chapels, schools, hotels and other institutions) have been so certified. The distribution of the newly-erected houses according to wards is interesting. The chief extensions have been in East Hunslet (427), North-East Ward (402), North (353), Headingley (324), Armley and Wortley (308), West Hunslet (268), Bramley (259) and East Ward (211). Holbeck accounts for exactly 200, followed by New Wortley with 137, and the North-West Ward with 122.

The Banking Premises of Messrs. Cocks Biddulph & Co. been added to have considerably from plans by Mr. J. Oldrid Scott, F.S.A., F.R.I.B.A. The additions are to be fireproof on the "Fawcett" system.

London County Council.—At last week's meeting the recommendation to hold a housing conference on June 28th at the County Hall, Spring Gardens, S.W., was agreed to. After a short discussion the Council decided that on account of the cost, amounting to £1,450, the request of certain petitioners for a horse-ride in Finsbury Park could not be acceded to. For some years past the Technical Education Board have been seeking suitable premises for the permanent accommodation of the Central School of Arts and Crafts, at present housed in premises in Regent Street. On November 8th, 1898, proposals were submitted to the Council for the acquisition of premises close to the present school, known as Oxford Mansions. The recommendation was postponed, and afterwards referred back. Next week a proposal will be submitted for the purchase of a site at the corner of Orange Street and Southampton Row at a cost of £45.000 for the erection of the school. The Board also propose to establish a day training college for teachers.

A New Dovetailed Brick.—Mr. P. Chick, of 121, Oakhill Road, Putney, is making a patent dovetailed recessed brick of novel form which provides improved means of fixing joiners' work, advertisement boards, &c., to brick walls. The course is laid with the recess in the brick upwards, a wood slip is then laid in this recess, either the whole length of the wall, or with a stretcher at intervals of 2ft. to 3ft. The next course is then laid, securely fixing the wood slip as a ground to be nailed to, and, projecting the thickness of the plaster, forms a guide to the plasterer. One course of bricks can also be used instead of two, or the wood slips extended to the depth of a brick or more to obtain a wider surface for fixing larger work. It is claimed that by the use of Chick's patent brick and wood slip a first-class job is obtained at a reduced price in consequence of the great saving effected in joiners' labour, first fixing being entirely dispensed with and the plasterer finishing his work ready for the joiner, who is able to fix his work quicker and better. For skirtings, dados, picture rails, panelled door casings, splayed linings, &c., the advantages are obvious, and better than the present method of plugging walls or fixing into breeze bricks. Chick's bricks are at present made in two qualities.

NEW WHARVES AT PLYMOUTH.

LAST August the Victoria Wharves and Pier at Cattedown were formerly opened by the then Mayor of Plymouth (Alderman J. Pethick). This event marked the beginning of a new and important phase of the development of the Cattewater. At that time, though the dock which forms one of the chief features of the undertaking was completed and ready for use, a good deal of constructive work remained to be done. Since then active progress has been made towards the completion of the wharves and buildings, and a clearer idea can now be formed of the magnitude of the undertaking, which owes its inception of execution entirely to the enterprise of Mr. C. L. Duke. Within the dock, which is 250ft. in length, there is a depth of 27ft. of water at low spring tides. This has been achieved by making the bottom of the dock lower than the bed of the harbour, enabling large vessels of heavy draught to lie afloat at all states of the tide. The dock has, indeed, a greater depth of water than any other quay, wharf or dock in the port. Since August the construction of a pier jutting out into the Cattewater has been commenced, and work upon it is now in full swing. Built of concrete, the pier will be 500ft. long and 50ft. broad, and on the east side will have a minimum depth of 27ft. of water at low tide. Besides affording additional shelter to the dock, the pier will, when completed, increase the deep-water wharfage to a length of 1,300ft. In addition the property includes other wharves with shallow water at low tide. At a cost of about £14,000, the Cattewater Commissioners are at present dredging the lower harbour to a uniform depth of 17ft. at low spring tides, and at his own expense Mr. Duke is deepening the approach to the Victoria Wharves to a similar depth. This will greatly facilitate traffic in the harbour and render access to the Victoria Wharves easier at all states of the tide. Attached to the wharves is a considerable extent of ground, and on the west side of the dock No. 1 warehouse, with a capacity of 16,000 superficial feet of floor space, has been completed, while No. 2 warehouse, with an area of 20,000ft. floor space, is rapidly approaching completion. Both these buildings are massive stone structures with concrete floors, provided with every convenience for the storage of merchandise. On the east side of the dock transit sheds are in course of erection, which will have a superficial floor space of 6,000ft. Other buildings for storage and transit will be erected as the traffic develops, and Mr. Duke has spare ground for the erection, if required, of warehouses with a total floor space of nearly five acres. More than a mile of railway sidings has been laid in the wharves, the track being laid with wood blocks, and both the Great Western and South Western Railway Companies have direct access to the dock. Steam cranes of the latest type have been provided for the rapid handling of cargoes, and these are to be supplemented shortly by hydraulic cranes, hoists, conveyers and capstans. It is anticipated that with the additional facilities now provided at Cattedown new trade will be attracted to the port.

Keystones.

The New Opera House, Bank Premises and Shops at Tunbridge Wells was commenced last week, Mr. John P. Briggs, of Arundel Street, Strand, who has prepared the designs, hopes to get the theatre portion of the scheme ready by Christmas.

Harding v. Ewing.—Messrs. Guy Ewing & Co., of 84, Mount Street, Park Lane, W., inform us that they have no connection whatever with the defendant in this case, which was reported on p. 284 of our last issue, the judgment being given on p. 299 of the present issue.

Maidstone's New Theatre.—At a recent meeting of the Maidstone Urban Council, plans of the new theatre in Brewer Street, prepared by Mr. John P. Briggs, architect, of Effingham House, Arundel Street, Strand, were approved. It is hoped to have the building completed by the autumn.

The New Joint Fever Hospital for Dumbarton, erected on a site at Havock, by the Western District Committee of the County Council of Dumbarton and Dumbarton Town Council, was opened recently. The site on which the hospital stands is in a commanding position overlooking the Clyde, and extends to nearly five acres. The buildings consist of administrative block, two pavilions (each of two wards), caretaker's house, &c. The original cost was estimated at £14,000, but this had been exceeded. The plans were prepared by Mr. John M. Crawford, architect, Dumbarton, and the work was carried out under the care of Mr. G. Roxburgh, inspector of works. The wards are capable of holding forty-four beds. The sewage is to be treated by means of the septic tank principle.

Architectural Association Day School: Appointment of Master.—The Committee invites applications from architects for the post of master in the day school about to be established at the Architectural Association. Particulars will be forwarded upon application to the secretary, 56, Great Marlborough Street, W. Arrangements have now been made to open a complete day course in October next, in addition to the present evening course, which will be continued as before. The advisory council in reference to these classes consists of the following gentlemen:—Professor Aitchison, Dr. Rowand Anderson, and Messrs. F. T. Baggallay, John Belcher, Hippolyte J. Blanc, J. M. Brydon, J. J. Burnet, W. D. Caröe, T. E. Collcut, Henry L. Florence, Ernest George, Henry T. Hare, T. G. Jackson, E. W. Mountford, Leonard Stokes, C. F. A. Voysey, Alfred Waterhouse and Aston Webb.

A New School at Edzell is to be erected from competitive plans by Mr. D. Wishart Galloway, architect, Brechin, at a cost of £2,000.

The Queen Victoria Memorial at Liverpool is to consist of a monument containing a statue of the late Queen. It is proposed to erect it on the vacant space lately occupied by St. George's Church.

The "Oxford" Wing of Welbeck Abbey, which was so much damaged by fire last October, has been demolished to make way for an entirely new wing. The alteration will also involve the destruction of the covered tan gallop, one of the sights of Welbeck.

Workmen's Dwellings at West Ham.—The West Ham Corporation have in hand a scheme for erecting workmen's dwellings (double tenement) on the Manor Road and Temple Mills estates. The houses are estimated to cost £133,296. The rentals for the double tenements will range between 12s. and 12s. 9d. per week, and the houses will be fitted with all modern conveniences, including the electric light.

A New Forward Movement Hall at Newport, Mon., has been erected in Corporation Road in the Renaissance style of architecture from the plans of Messrs. Habershon, Fawckner & Groves, at a cost of £2,700. The building, which is of red brick with freestone dressings, has accommodation for 800 persons, and is provided with classrooms and vestries and numerous exits. Mr. D. Jones, of Newport, was the builder.

Stonehenge will soon be shut off from the public by a wire fence, which Sir Edmund Antrobus, the owner of the portion of Salisbury Plain on which the monument stands, is having erected round the stones. The "Salisbury Times" learns that on and from the 24th inst. a charge of 1s. will be made to visitors who may desire to pass this barrier and get a near view of the monument.

York Architectural Society.—A general meeting of the members of this society was held recently, at which the officers to serve on the executive were chosen. In the unavoidable absence of the president, Mr. William Bell, the chair was occupied by Mr. C. H. Channon, Malton. Regret was expressed at the retirement of the hon. secretary, and a special vote of thanks was passed to Mr. Burleigh for the manner in which he had filled that office for the past ten years. Mr. Channon was unanimously elected president, and also represents the York Society on the Council of the Royal Institute of British Architects, London. The vice-presidents chosen were Mr. A. B. Burleigh and Mr. E. T. Felgate. Mr. Thomas Monkman accepted the office of hon. treasurer, and also acts as a trustee of the society. Mr. George Benson was elected as hon. secretary, and the following gentlemen were selected to serve on the committee, viz.: Messrs. J. Brett, jun., S. R. Kirby, S. Needham, A. J. Penty and F. Raney. Mr. S. G. Highmoor was re-elected librarian, and Messrs. E. A. Poland and A. J. Toomer auditors for the current year.

West Malling Church.—The nave of St. Mary's Church, West Malling, is being rebuilt by Messrs. G. E. Wallis & Sons, of Maidstone, from the designs of Mr. J. T. Micklethwaite, F.S.A., at a cost of £4,700. The nave will contain two side aisles, with a saddle roof, and light will be admitted through clerestory windows, while heat will be diffused by means of hot water coils. The walls will be erected on the same foundations as the thirteenth-century nave. In the eleventh century a Norman church was built (possibly taking the place of the old Saxon one) after the type of those common in the district, and in the fourteenth century the stone for the enlargement of the old Norman nave by the addition of two aisles with other improvements was laid. Then as the centuries went on the building failed, and the historian Hasted, writing in 1779, recorded that the chancel and steeple were then standing but that the nave had fallen down in 1778. A brief was obtained in 1779 to raise money over England for £2,129, which was needed for the rebuilding, completed in 1781. Thus, in 1780, there must have been a third stone-laying to rebuild the nave. At first it was proposed in the present restoration to make the Georgian nave as suitable as might be, but eventually it was decided to rebuild the nave entirely.

An Infectious Diseases Hospital is to be erected by the Llanelly Borough Council on a site at Machynis, at an estimated cost of £5,000.

New London and South Western Bank Buildings have been erected at the corner of Plashet Lane and Gipsy Lane, East Ham, by Mr. James W. Jerram, from designs by Mr. J. H. Carte. The style of architecture is chiefly Venetian, with a Byzantine cupola. The materials used are terra-cotta and Ruabon bricks, supplied by Messrs. Edwards, of Ruabon.

Six Cottage-Homes for the Gateshead Board of Guardians, each to accommodate fifteen pauper children under a foster-mother, were recently opened. They have been erected in the Derwent Valley, at a cost of £15,000. There are workshops in connection with the buildings where the boys and girls may be initiated in useful trades.

Over the late Professor Max Müller's Grave in Holywell Churchyard, Oxford, a tall Celtic cross, standing some 10ft. high, has been placed. It is in grey West-country granite, and has been practically designed by the late Professor's widow, whose original sketch has been carried out by Messrs. Harry Hems & Sons, ecclesiastical sculptors, of Exeter.

A Useful Map.—We have had an opportunity of testing the new three miles to the inch map of England issued by Messrs. Keith Johnston, Ltd., of Edinburgh and London, uniform with their map of Scotland, and find it accurate, clear and trustworthy. In the printing, black ink is used for the towns, &c., with brown for the hill names and blue for water, whether river, firth, or lake. To cyclists it will be most useful, the roads being clearly indicated. Messrs. Keith Johnston undertake special map work, and are prepared to supply a map of any particular district having just such features marked as may be required. The series of maps and atlases issued by the firm should be remembered when selecting a map either for professional work or holiday purposes.

Architectural Association.—The officers and committee for the session 1901–1902 have been elected.—They are as follows: President, Mr. W. Howard Seth-Smith; vice-presidents, Messrs. G. B. Carvill and E. Guy Dawber; hon. treasurer, Mr. Francis Hooper; hon. librarian, Mr. F. J. Osborne Smith; hon secretaries, Messrs. R. S. Balfour and H. P. G. Maule: committee, the foregoing gentlemen and Messrs. A. T. Bolton, F. D. Clapham, W. A. Forsyth, H. T. Hare, Hon. A. McGarell Hogg, Arnold Mitchell, W. A. Pite, G. H. Fellowes Prynne, W. H. Raffles and E. Howley Sim; hon. solicitor, Mr. W. H. Jamieson; hon. assistant librarians, Messrs. C. H. F. Comyn and W. A. Jeckells; hon. auditors, Messrs. E. Greenop and Guy M. Nicholson; and secretary and registrar, Mr. D. G. Driver.

"The Craftsmen's Club."—A club under this title, open to all respectable men skilled or interested in any art or craft, was founded at a meeting held at Birmingham on the 26th March, 1901, to invite applications from anyone interested in this movement. The objects of the club are to enable readers of various technical papers to meet personally, to form a library to facilitate the acquisition of information in case of minor technical difficulties, in perfecting and finishing work of different sorts, to encourage the undertaking of useful hobbies, to lessen their expense and to increase their usefulness. Lectures and demonstrations are to be encouraged and an effort made to take premises for the sale of work done by members. Full reports of proceedings will be obtainable, representatives are to be appointed in various towns and a staff of experts and advisers appointed as the club developes. It is claimed, that while the general idea of such a club is not new, there is a novelty in its method of seeking a common basis for active results, and the utmost precautions are being adopted to build up the club on good economical and financial principles. No dividend is to be payable. One-third of the subscriptions is to be devoted to reserve and to revert to charity if the club dissolve. A trial set of rules, prospectus, &c., have been typewritten, and a copy will be sent to applicants who care to enclose 6d. for the same to Mr. W. Moseley, secretary, 319, Broad Street, Birmingham.

The New Petit Theatre has been opened in the Boulevard de Clichy, Paris.

Alterations at Aberystwyth Town Hall at a cost of £6,000 formed the subject of a Local Government Board enquiry recently.

A New Church Mission Room at Churwell is being erected. The building will be in the Early English style of architecture, and provide accommodation for 300 worshippers. The cost, exclusive of the site, will be £1,250.

A New Church at Grove, near Wantage, has been erected at a cost of £2,000. The pulpit, which has been removed from the old church, was first occupied by Dr. Pusey at the opening of the church in the year 1837. The font, too, which originally came from Pusey, near Faringdon, Berks, is the one at which Dr. Pusey was baptized.

Duchess of Teck Memorial.—A drinking fountain, erected in memory of the late Princess Mary Adelaide, Duchess of Teck, was unveiled at Richmond last week. The fountain, which is of polished red granite, immediately adjoins the Richmond Park entrance on Richmond Hill, and is of ornate design. Attached are four bronze plaques, the principal consisting of a lifelike bust of the late Duchess. Mr. F. J. Williamson was the sculptor.

A New Town Hall at Marlborough is being erected of brick and stone, with red tiles. Its accommodation includes a session court and council chamber on the ground floor, and a large assembly room on the floor above, adaptable for the second court at quarter sessions. In the basement are cells, warders' lobbies, lavatories and a muniment room. The contract price is £7,270.

A Scholarship of £25 for one year is offered by the Worshipful Company of Coach Makers and Coach Harness Makers of London, in connection with the higher technical day class in Road Carriage Building at the Polytechnic carriage building schools, Balderton Street, Oxford Street, London W., commencing Monday, September 30th, 1901. Conditions, and forms of application to be filled in by candidates desiring to compete for the scholarship, can be obtained by applying to the Clerk to the Company, Coachmakers' Hall, Noble Street, E.C., or 8, Lincoln's Inn Fields, W.C. The forms must be returned to the Clerk on or before July 3rd next.

Hyde Abbey, Winchester.—It is to be hoped that the Hants County Council will acquire for the public, as a memorial to King Alfred, the site and remains of old Hyde Abbey, the burialplace of the great king and his wife Alswitha. Founded originally by King Alfred as a monastic house, it was finished after his death by his son, Edward the Elder. Despoiled by William the Conqueror because some of the choir fought with Harold at the battle of Hastings, a portion of its lands were afterwards restored. A century later a new church and monastery were built by Henry I. on what was known as the Hyde Mede. Burnt down in 1140, it was rebuilt by Henry II. in 1182, from which time it flourished till the era of the Dissolution, when the Abbey was surrendered to Henry VIII., and soon afterwards pulled down, the site being granted to Richard Bethel. Not much is now left.

The New Walton and Kirkdale Technical Institute has now been completed. It has cost £8,500, exclusive of scientific fittings, &c., and is situated at the corner of Carisbrooke Road and Harlech Street. The style of architecture chosen by the Corporation surveyor, Mr. T. Shelmerdine, from whose plans the pile has been reared, has been the English Renaissance, and the structure is built of red wire-cut Ruabon bricks, with Grinshill stone heads and dressings, the roof being of Velinheli slates. The main frontage, which is in Carisbrooke Road, has a length of 126ft., the elevation in Harlech Street covering a length of 65ft. The principal entrance is from Carisbrooke Road, which opens into a vestibule and hall, and there is a staircase to the upper floor and to the basement, and the corridors leading to the various class-rooms are ample in their width. On the ground floor there are five class-rooms, all of large size. In the basement two class-rooms have been arranged, whilst on the first floor there are three class-rooms and an examination and lecture hall 52ft. by 34ft.

THE ROYAL OPERA HOUSE, COVENT GARDEN.

Some Particulars of the Alterations made by Edwin O. Sachs, Architect.

THE alterations which have been carried out at the Royal Opera House at Covent Garden, under the direction of Mr. Edwin O. Sachs, may be divided into three groups: (1) Structural alterations for the audience, (2) structural alterations for the management, (3) and equipment of the stage.

Structural Alterations for the Audience.

These comprise the re-modelling of the exit and entrance arrangements of the stage and the provision of a special stalls corridor, so that the stalls, with their corridors, now form an independent whole, having their own conveniences, cloak rooms, &c., and do not, as formerly, have to encroach upon the accommodation of the pit-tier boxes or the entrances and exits of other parts of the house.

Entering from the main vestibule, there are now two sets of swing doors into the stalls corridor. From this corridor there is a central entrance into the stalls, and one on either side (right and left). There are pass staircases from the other tiers to the stalls corridors, and a special extra exit to Floral Street. It is needless to say that the rearrangement of entrances and exits to the stalls is of considerable importance in case of panic or fire, quite irrespective of their general convenience.

In connection with the stalls alteration, the old-fashioned front and apron of the stage, which used to protrude into the auditorium, has been abolished, and the orchestra set closer to the curtain line. This considerably affects the lighting arrangements of the stage and brings the "picture" more in accordance with modern ideas. It also leads to the arrangement of extra rows of stalls. Two new boxes have also been formed in place of the old entrance to the stalls from the pit box tier. A number of minor improvements have also been made in different parts of the house, although perhaps these do not call for any lengthy comment. The carriage approach from Bow Street has been improved by the formation of extra doors, so that two lines of cabs and carriages can now "set down" and "pick up."

Structural Alterations for the Management.

These alterations, at the back of the house, comprise quite a number of important items: an entire re-modelling of the storage and wardrobe arrangements, as well as the equipment of new workshops.

In the first place, the large property shop, which used to be over the auditorium, has been accommodated on a large additional floor, erected over the whole of the back wing of the building. This back wing has been re-modelled, and now contains fine suites of rehearsal rooms both for solo artistes, for the chorus and for the ballet, distributed on three floors, well lighted and aired, and equipped with all modern sanitary arrangements, an independent staircase, and an independent exit. The entire wardrobe, dressmaking and tailoring department has been housed on the south side of the stage, in suites of rooms comprising three upper floors, having two independent staircases and inter-communication by means of a hydraulic lift.

On the north side of the house a suite of one of the upper floors has been retained as an armoury, a second has been re-modelled for storage purposes, whilst a third now comprises a fine set of offices for the stage department. Here, again, an independent staircase connects the various floors, and inter-communication is also obtained by means of a new hydraulic lift.

Below the stage level on either side of the house the various suites of rooms have been remodelled and modernised as far as possible, one suite next to the stage entrance, for instance, comprising the offices of the firemen, stage mechanist and electrician, all in close proximity to one another and in close touch with the stage manager's offices by the independent staircase just mentioned, and with the stage by a pass stairs on the other. Even the stage door has been re-modelled, inasmuch as the doorkeeper's office now has a small waiting-room; and an entirely separate entrance, with timekeeper's office, has been formed for the working staff, by which means the crowding of the stage door will be reduced.

The back portion of the stage has been separated off from stage level downwards, with the object of forming a large scenery store built on fire-resisting lines, and equipped with all the necessary racks for holding the "cloths" used in the usual repertoire. Similarly, in the back wing, an old store, formerly known as the "Infirmary," has been enlarged and re-modelled, with the view of forming a "wing" store. In spite of these two modernised storage arrangements, the accommodation for scenery at Covent Garden is still necessarily of a very limited character compared with that of Continental houses, and must remain a source of constant anxiety and trouble to a management who produce an average repertoire of twenty-five operas in the short space of eleven weeks.

Equipment of the Stage.

We now come to the great alteration of the stage, an enormous undertaking at all times, but rendered particularly difficult owing to the short period available, the existence of a Ball Season during the major part of the winter, and the presence of an enormous stock of scenery, &c., which it would have been impossible to have moved out of the house except at a very great cost.

EDWIN O. SACHS, ARCHITECT.

The alteration of the stage comprised entire gutting from top to bottom, so that nothing of the old stage from "gridiron" to cellar remains, with a small exception of a couple of wood-fly galleries. Further, the alteration comprised the entire unroofing of the stage, raising the structure by 20ft., and re-roofing on modern lines. Further, it involved a considerable amount of excavation work, with a view of forming deep pits to take certain parts of the mechanism.

An entirely new "gridiron" had to be constructed right across the stage, two "gridiron" galleries had to be constructed on either side, and a number of light connecting ways running across the stage. An entirely new stage, including all construction parts, had to be provided, together with a "mezzanine" floor. The opening of the stage towards the auditorium had to be equipped with a fire-resisting curtain (the largest in London), and a strong party wall built from the stage level downwards into the cellar. In connection with this constructional work, the whole of the gridiron galleries, stage and mezzanine had to be re-floored, and the entire cellar or superficial area of the stage concreted over.

The scene docks on either side of the stage had to be remodelled; one of them, for instance, being equipped with a large scene door, with the revolving shutters, measuring 28ft. in height; another being provided with several floors to take planned scenery, such as rocks, groups, &c. The exit and entrance arrangements of the stage also had to be re-modelled in such a way as to allow of greater convenience, and for the greater safety of the employees in case of accident.

In connection with the constructional alteration of the stage, an entirely new stage equipment had to be provided on modern lines, everything above stage being now worked on the Brandt patent counterweight system, and everything below the stage on Sachs's patent electrical bridge system (see plan on the next page and illustrations in centre plates).

Without entering into detail, the stage may now be described as comprising a series of six horizontal sections running parallel with the curtain line from front to back, each section being 8ft. wide, and the whole being followed by a large back stage or rear stage. The first section contains nothing but a plain "carpet cut," and openings to take the old-fashioned "grave" trap, "star" trap or other similar contrivances. The second and third sections comprise large bridges, which can be raised 6ft. above the stage or lowered 8ft. below the stage, constructed in two levels: on the lower level appliances can be installed for the purposes of raising minor platforms above stage level, or sinking taps and the like. The fourth, fifth and sixth sections comprise large bridges running right across the stage front, which can be raised 9ft. above the stage or lowered 8ft. below. The back stage has no openings or mechanism beyond certain trap doors to a scenery store and the necessary electrical mechanism for raising and lowering scenery for storage purposes.

Between the various sections of the stage, long longitudinal flaps 2ft. wide have been formed, and these can be easily opened to allow scenery to be passed through below for transformation and similar scenes. Each section is equipped with what is termed a pair of chariots, to hold "wing" lights placed on so-called wing ladders. All the electrical bridges are worked from "mezzanine" level and from ordinary switch boards; they can be raised and lowered at various speeds and take loads up to two tons. They can also be moved without vibration or noise at a cost of about ¼ for power on a full rise when loaded.

Above the stage level, each section has its series of lines to take cloths, borders, &c. Each section has a batten, from which the electric battens are suspended; and each section has a large wooden lattice-girder, from which heavy pieces of scenery can be suspended. There are, on the average, about ten lines for ordinary battens, a girder batten and a light batten to each section; besides these lines, there are the equipments of flying apparatus and the like, whilst in front there are, of course, the necessary lines for tableaux curtains, act-drops and draperies.

Everything that is suspended from above can be worked at stage level, or at either of the gallery levels, every scene being counterweighted to a nicety; and one man can easily handle any scene. No mechanical contrivance is required, and in practice quite a number of scenes can be rapidly changed in a minimum of time.

Throughout the structure and mechanism steel has been used, iron pulleys and wire cable; and the inflammable materials have been absolutely reduced to the flooring of the gridiron and galleries, and the hardwood flooring of the stage and mezzanine. In other words, an absolute minimum of inflammable material replaces what was almost a maximum; and seeing that the electric light has been installed, the risk of an outbreak of fire or its spread has been materially reduced.

The arrangements for the electrical illumination of the stage had naturally to be remodelled and elaborated to meet the altered circumstances, the whole of the plant installed some two years back, of course, being re-used. Similarly, the steam appliances, telephone, speaking-tube and other minor technical installations to be found on a modern stage were re-modelled. The system of gas-lighting was entirely abolished, and, similarly, the system of limelight for special effects.

Programme of Work.

Regarding the programme under which the work was carried out, it would be well to remember that the Opera season of last year closed on August 3rd, 1900, and it required three or four weeks for the scenery to be cleared in the usual way. Work was, however, immediately commenced on the morning after closing, the first work comprising the alteration of the auditorium and formation of corridor already described, and the raising of the roof over the stage. The whole of the alterations were completed on October 1st, and the big roof alteration completed on October 8th.

It should be here remembered that the roof alteration comprised a span of 90ft. to a width of 70ft., at a height of 90ft. above the ground, without any facilities for storage accommodation in the vicinity; that the building had to be kept waterproof during the alteration; and that the stage hands and mechanists were working below whilst the alteration was going on above. The scaffolding arrangements alone were most complicated. A system of suspended scaffolding was applied, no vertical support being obtainable on the span of 90ft. When the roof was completed, the "gridiron" had to be laid in a similar way.

Contemporaneously with this alteration the big fire-resisting curtain was being fitted in the proscenium opening, and the walls between stage, cellar and auditorium being built. The curtain was put into position by October 15th, so that Mr. Rendle was able to take up the tenancy for his Ball season, and the first ball was actually given on October 26th. The big scene store at back of stage was taken in hand in September, and was completed by November 1st, 1900. The back wing alteration at the back was the last taken in hand, and was completed by January 1st, by which time the new hydraulic lifts in the staircases were in working order, so that the great removal of stores into their different new places could be undertaken.

On January 4th the stage floor was opened and gutted. The new stage floor was closed in on April 4th, when the whole of the work was practically completed, with the exception of some minor mechanical details which were completed by the end of April. The gutting of this lower portion of the stage alone comprised a wreckage of nearly 1,000 cartloads of timber and the erection of 150 tons of complicated steel work.

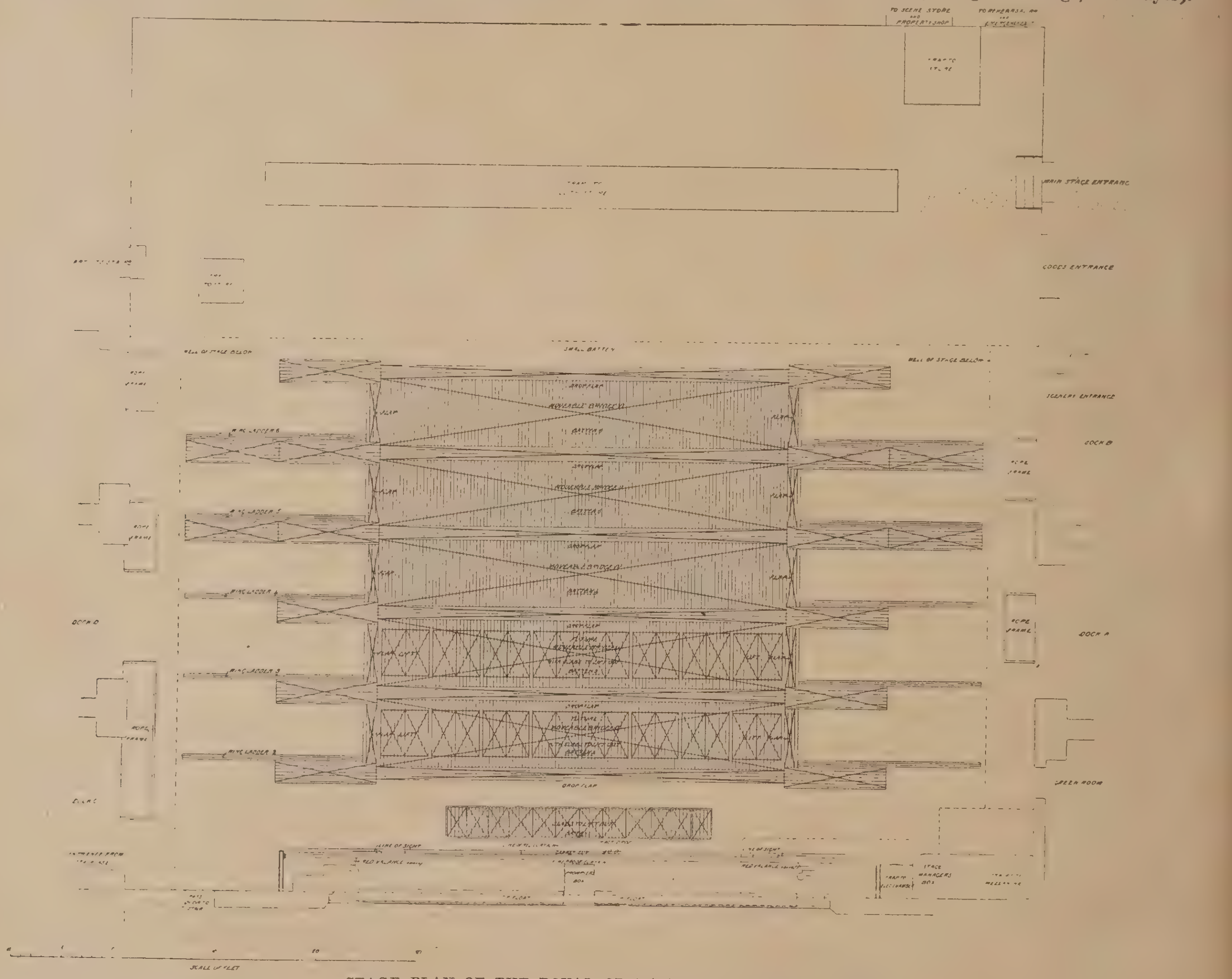
It will thus be seen that the two principal problems, *i.e.*, that of raising the roof and that of gutting the stage, occupied respectively two and three months, both pieces of work having beaten English records for operations of their respective classes, and having run American records very closely. The circumstances were, of course, very peculiar, owing to lack of space and the enormous quantity of storage that had to be handled, and much of the work was of an exceptionally dangerous character and of considerable risk to the workmen employed.

Nevertheless, not a single accident, much less a fatal casualty, occurred; and this is again a record, and compares particularly favourably with the accident list of the Berlin Court Theatre, which, during certain similar alterations, comprised one killed and seventeen seriously injured. The results, both in time and in lack of accident, must be attributed to a great extent to the co-operation of all parties concerned, not forgetting the artisans and labourers, who were, to a great extent, new to the class of work required.

The entire arrangements on behalf of the Grand Opera Syndicate were in the hands of the directors, Earl de Grey and Mr. H. V. Higgins, who, after consultation with their business manager, Mr. Neil Forsyth, and their stage manager, Mr. Neilson, based their programme almost entirely on a scheme prepared at their direction by their technical adviser, Mr. Edwin O. Sachs, in 1899, shortly after the Opera House had been taken over. The final designs were entrusted to Mr. Sachs's execution, who was assisted by his chief assistant, Mr. Lister, Mr. Thomas Kissack acting as clerk of the works.

The general contractors were Messrs. Colls & Son (manager in charge, Mr. Collins; foreman, Mr. Dowse). The ironwork contractors for everything above the stage level were Messrs. Lindsay, Neal & Co., Ltd., whilst the entire complicated structural and mechanical ironwork below stage level, including the stage "bridges" and lifts, was by Messrs. Drew-Bear, Perks & Co. (manager in charge, Mr. Simco). The electrical power plant for the "under machinery" was provided by the Thames Ironwork Shipbuilding Co., Ltd., of Blackwall (manager in charge, Mr. Flood); whilst the whole of the elaborate counterweight mechanism above stage level was provided by the well-known Berlin stage mechanist and contractor, Mr. F. Brandt, who personally attended to the installation of his appliances in London. The fire-resisting curtain was by Messrs. Merryweather & Sons, Ltd., and the alterations in the auditorium by the Army and Navy Auxiliary Supply, Ltd. (manager in charge, Mr. Player).

Mr. Sachs is particularly anxious to acknowledge the splendid assistance rendered him by the contractors and their representatives, and to particularly note the cordial manner in which the various firms worked hand in hand under very trying conditions. He also wishes to express his best thanks to Mr. Robert Affleck, stage mechanist, lately of the Court Theatre, who, by advice on matters of detail, and by his ready assistance in facilitating the building operations, rendered most valuable services. The whole of the stage will henceforth be under the control of Mr. Affleck, ably assisted by the theatre electrician (Mr. Crawshaw), who during the building operations, had charge of the alterations to the electric lighting equipment. The new Opera season commenced on Monday in last week.



STAGE PLAN OF THE ROYAL OPERA HOUSE, COVENT GARDEN.

Some Particulars of Mr. Sachs's Career.

Mr. Sachs recently formed the subject of one of "Celebrities at Home" published in the "World." The writer says: On reaching Dover with Mr. Sachs, who has entertained you *en route* with his adventures in Russia, his sketching tours in East Prussia, his health trips to Egypt, and his experiences as a fireman in Berlin and Vienna during the seven years of his professional studies abroad, you place yourself behind a pair of horses who seem to share their master's love of haste, and who bowl the victoria swiftly along the sea-front, and, "springing" the hill that sweeps past Dover Castle, trot smartly over the Cinque Ports Road leading to Deal. A sharp turn to the right, however, presently takes you through the village of St. Margaret's-at-Cliffe, with its historical Norman church. Then the coastguards' station on the top of the cliff is passed; and a little while afterwards you traverse a steep carriage-way which, after passing between two massive piers, brings you in sight of South Foreland House (Mr. Sachs's residence), an imposing Italian villa which, with its white-glazed brick walls, Renaissance detail and terraced front set in a frame of green might well have been transported from San Remo or Bordighera, while the view you survey from the terrace to which you have mounted is magnificent in the extreme. As regards Mr. Sachs's many literary achievements, order and system are vital features; and not the least of these you will find in a commodiously constructed bureau in his study, the carving of which was designed by one of the ladies employed by him in architectural work. "Modern Opera Houses and Theatres" is indeed a monumental achievement, giving the detail of construction, organisation and management of every dramatic house in Europe. It was published serially in folio during the years 1896, 1897 and 1899, and represents an exhaustive study of the subject and the labour of over eight years. The text was personally written in the late hours of the night, while the illustrations were prepared, under Mr. Sachs's direction, by an admirable staff. The volumes have been subscribed to by every potentate and learned society in Europe; and it has been eulogised by every organ of the press. Nor does it lessen one's interest in these volumes to learn from Mr. Sachs that it was while he was keeping watch and ward as a fireman of the Vienna Municipal Fire Brigade—a self-sought occupation—during the Musical and Theatrical Exhibition in that city, that he conceived the notion of compiling his comprehensive work on the theatre architecture of the world. (Mr. B. T. Batsford, by the way, much regrets to announce that the second issue, promised for the opening of the opera season, has been unavoidably delayed by the illness of the author. It is now scarcely probable that Mr. Sachs's work can be re-issued before the autumn.)

Then you may turn to his "Stage Construction," embellished with reproductions of some of Herkomer's charming studies in lighting; or you may marvel at Mr. Sachs's statistical record work on conflagrations from 1797–1897, giving the details of eleven hundred fires in theatres all over the world; while you will scarcely need be told that fire and its prevention is Mr. Sachs's speciality, after you have dipped into the volumes containing the reports of the experiments made in pursuit of non-inflammable architectural and building material by the British Fire Prevention Committee, of which Mr. Sachs is the chairman as well as the founder, directly after the Cripplegate disaster in 1897.

The incidents of Mr. Sachs's career after he had completed his studies at the London University College School, and sought to make himself proficient in foreign languages on the Continent, are by no means destitute of romantic interest. The future of the young student was assuredly foreshadowed when he nominally apprenticed himself at Falkenburg, and learnt to lay bricks during the erection of a new wing to this finishing school. The practical bent of his character and its mechanical tendency loomed larger as he set himself to learn "smithy" work on commencing his architectural studies under Ludwig Hoffmann, the designer of the Imperial Law Courts at Leipsic, and now city architect in Berlin. Subsequently Mr. Sachs entered the office of the celebrated Professor Ende, president of the Prussian Royal Academy; and during this period he first devoted himself to the questions of theatre construction, protection from fire in theatres and the minimising of the liabilities of panic in them. After Mr. Sachs had studied his profession from every standpoint, and had travelled with an observant eye, supplemented by the services of a well-filled sketch-book carried through all the northern capitals of Europe, he returned after seven years to London, where, it is needless to say, he has acquired an extensive practice as an architect, and where he is recognised in technical circles as a leading authority on matters relating to fire protection, theatre building and stage machinery.

Engineering Notes.

The Mond Gas Bill, referred to in our issue for May 8th, p. 267, has been approved by the Select Committee of the House of Commons.

Mr. Morgan Williams, M.Inst.C.E., of 39, Victoria Street, Westminster, has been appointed consulting engineer to the new Willesden Infirmary by the Willesden Board of Guardians.

The Fever Hospital, Birmingham, has just been supplied by Messrs. E. H. Shorland & Brother, of Manchester, with their patent double-fronted Manchester stoves with descending smoke flues.

Electric Light in Christ Church, Oxford.—The Governing Body of Christ Church have decided to carry out the electric lighting scheme of their consulting engineer, Mr. Morgan Williams, M.I.C.E., of 39, Victoria Street, Westminster, The contract has been placed with Messrs. Hill. Upton & Co., of Oxford.

A New Bow Bridge.—The West Ham Corporation and the London County Council are formulating a joint scheme to widen old Bow Bridge, the main outlet of London on the eastern side, at a cost of £19,000. The old stone bridge is only 40ft. wide, and in its place it is purposed erecting an iron girder bridge 70ft. wide.

The Electric Lighting Effects in the "Cinderella" pantomime at the London Hippodrome, which were carried out so successfully on the "Electric Lighting Boards" system, are now being repeated for various purposes in different parts of the country. The entire Irish section of the Glasgow Exhibition has been decorated by a scheme of garlands interspersed with shamrocks provided by the Electric Lighting Boards Company, of 7, Pall Mall, S.W. A similar scheme of decorative illumination has been installed for the Café Chantant at the Crystal Palace, whilst the effects have also been used for decorative purposes on several occasions at the Grafton Galleries.

A Novel Engineering Feat was accomplished on the Tyne recently, when the spans and roadway of the bridge connecting Newcastle and Gateshead, which had been built 4½ft. to the eastward of the position they were ultimately to occupy, were moved over into place. The building of the bridge has been remarkable as an example of modern engineering practice. An old bridge existed, and the new bridge has been built on precisely the same site the old one occupied. The traffic has yet gone on uninterruptedly. The new piers were built round about the old one, and the roadway and spans were erected a little above and 4½ft. to one side of the old roadway and spans, a temporary footway meanwhile being provided for foot passengers. The old piers were then taken away and the new roadway was lowered to its proper level, and moved over into its permanent position by means of hydraulic jacks in one morning. The total weight of the bridge was 1,600 tons, and the jacks were capable of exerting a pressure of 1,500lb. to the square inch. The bridge is built of steel and is of the American type, but the details are strictly in accordance with the best English practice. There are four spans, two of 252ft., and each of the others 170ft. The total length of the bridge and its approaches is 1,500ft. Its total weight is 2,900 tons. The bridge is carried on cylinder foundations, each 8ft. in diameter and sunk to a depth of 50ft. below low water. There are four cylinders to each pier. The engineers of the bridge are Messrs. Sandeman and Moncrieffe, of Newcastle, and the builders are Sir William Arroll & Co., of Glasgow.

Water from the Lake District.—The Earl of Jersey's Committee of the House of Lords has passed the preamble of a Bill promoted by the corporation of Barrow-in-Furness to empower them to impound the upper waters of the River Duddon and the Seathwaite Tarn in the Lake District, and to obtain from 2,000,000 to 3,000,000 gallons of water per day from these sources according to the quantity of water in the river, that is to say, so long as the flow does not fall below a certain amount. The measure was opposed by the urban district council of Millom, the Hod Barrow Mining Co., and the Millom and Askam Hematite Co., who all objected because they feared that the effect of diminishing the flow of the Duddon would be to cause the closing of the channels in the river estuary and so to put a stop to the sea trade of Millom.

LIVERPOOL ARCHITECTURAL SOCIETY.

PROFESSOR F. M. SIMPSON (president) took the chair at the annual meeting of the Liverpool Architectural Society, held last week. The report, which was adopted, stated that the membership of the society now stood at 146 members—namely, 55 fellows, 53 associates, 20 students, and 18 honorary members, an increase of 12. The library was being more highly appreciated. The accounts showed an increased credit balance. On the election of officers. the executive was unanimously chosen, while the council was, by rule, the subject of a ballot, the result being: President, Professor F. M. Simpson; vice-presidents, P. C. Thicknesse and T. E. Eccles, A.R.I.B.A.; honorary secretaries, Hastwell Grayson, B.A., A.R.I.B.A., and G. W. Fraser, A.R.I.B.A.; honorary treasurer, James Dodd; honorary librarian, E. G. Dickinson; council—fellows: C. E. Deacon, F.R.I.B.A., T. E. Eccles, A.R.I.B.A., H. Hartley, F.R.I.B.A., E. A. Ould, F.R.I.B.A., James Strong, P.C. Thicknesse, W. E. Willink, M.A., F.R.I.B.A.; and associates: E. P. Hinde, A.R.I.B.A., and Arnold Thornely, A.R.I.B.A. In closing the session, the president expressed thanks for his re-election, and referred to the pleasure he found in a visit to the East, where he collected a number of architectural photographs, which he had placed on exhibition. He thought it might be advisable at the opening of the new session to exhibit drawings or photographs of any interesting buildings, new or old, noted by members during their holidays. He hoped more papers would be contributed by members, the tendency of the society having lately been to rely too much on outside aid. He rejoiced in the spread of architectural education, in which Liverpool had led the way, and he said there were no doubt that as the new universities increased in number, architecture and similar subjects would be admitted to the regular degree course. Dealing with Liverpool's recent architecture, he alluded with pleasure to the breadth of scale and simplicity of treatment shown in the White Star offices, Parr's Bank, and the Royal Insurance offices, and said Liverpool had three open spaces at its disposal. The ground at the west of St. George's Hall was, he believed, to be architecturally treated. The space formerly occupied by St. George's Church awaited its fate. The most important space was that of the late George's Dock, which might be converted into one of the finest squares in Europe, containing some of the finest buildings, and form an impressive entrance to the city from the Mersey. He hoped Liverpool would avail itself of this great opportunity.

Brighton Improvements.—By a Bill just passed the Brighton Corporation are empowered to buy the Brighton Aquarium for £30,000. They are to spend £60,000 on improvements.

A New Church at Norbury is being erected. The new church, when built, will be called St. Philip's, and will be a chapel-of-ease to Christ Church. The site of the new church is on the Norbury Court Estate, at the top of Beatrice Avenue, which is the next turning past Pollard's Hill North, on the same side. The whole of the church is not to be built until funds allow, and the present portion is estimated to cost £4,450. A further sum of £2,500 or £3,000 will be required to complete the building.

Bricks and Mortar.

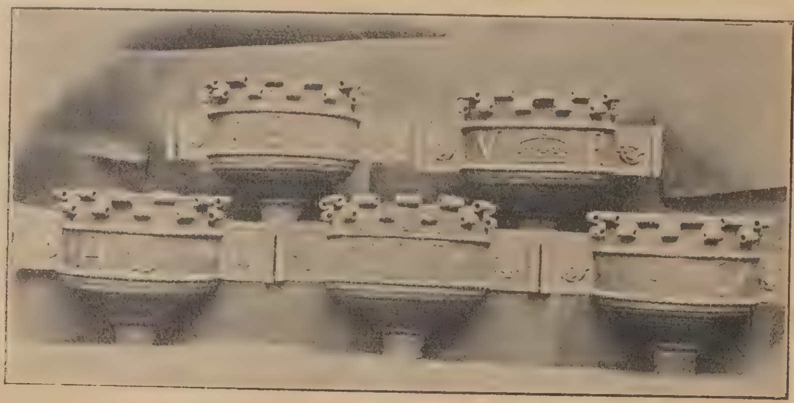
APHORISM FOR THE WEEK.

Wherever there is a beautiful statue there is a place of pilgrimage.—RICHARD JEFFRIES.

Our Plates. THE general view of the Glasgow Exhibition is in illustration of our article on p. 292 of this issue. We are enabled to reproduce it through the courtesy of the "People's Journal," Dundee.—Particulars of the new lifts at the Royal Opera House, Covent Garden, will be foundi in this issue, p. 303.

Rodin's Porte de l'Enfer. SOME years ago M. Rodin was commissioned to design and execute a doorway to be called the "Porte de l'Enfer," which was to serve as the entrance to the Musée des Arts Decoratifs. The Musée, however, is going to be removed to the Pavillon de Marsan, and Rodin was asked to go there and select the most suitable place for the *porte*, but the official architects did not agree with the project. and the question now is—what is to become of the doorway? Interviewed on the subject, the artist said that to him it was a matter of indifference where the *porte* may be placed. He had wished to give a new interpretation to bas-reliefs, to conceive a work where the decoration would harmonise with the *ensemble*, and so arranged that the play of light would give artistic diversity to the various motives of the sculpture. He hoped he had been successful: that alone interested him.

Stretton Church. In our issue for April 3rd last, on p. 147, we gave some particulars and an interior view of Stretton Church.



RAINWATER PIPE-HEADS IN LEAD, STRETTON CHURCH, STAFFORDSHIRE.
J. T. MICKLETHWAITE & SOMERS CLARKE, ARCHITECTS.

The rainwater pipe-heads illustrated on this page were all executed in lead from designs by Mr. J. T. Micklethwaite, of Messrs. J. T. Micklethwaite & Somers Clarke, Dean's Yard, Westminster, from whose designs the church was erected.

Archæological Research in Greece. THE researches carried out by Professor Fürtwangler, the eminent archæologist, in the precincts of the Temple of Athena, in the island of Ægina, have resulted in the discovery of five marble heads belonging to the famous series of Æginetan sculptures in the Glyptothek at Munich. The sculptures which adorned the pediments of the temple were discovered in 1811, and shortly afterwards brought to Munich by King Ludwig I. of Bavaria; the missing portions of the statues were supplied by Thorwaldsen. Three of the heads now discovered are those of helmeted warriors, the other two belong to female figures. As the export of antiquities from Greece is forbidden, the heads cannot be replaced on the statues to which they belong, but it will be possible to substitute casts for the heads designed by Thorwaldsen. A finely-executed hand belonging to a female statue, and other fragments, have been brought to light. The search for submerged statues near the coast of Anticythera has been resumed since Easter, but only some pedestals and a horse's head in fair preservation have been brought to the surface. Some fragments of an ancient ship and its anchor have been recovered.

Dr. Johnson's House. THE house in which Dr. Johnson was born at Lichfield has become the property of the Corporation. The town council have arranged to open the house at Whitsuntide, when the public will be admitted in much the same way as at other birthplaces—at Stratford-on-Avon, Olney and elsewhere. This famous house has undergone various vicissitudes since it was in the possession of Dr. Johnson, having been among other things a restaurant. Writing about twenty-five years ago, Mr. John Hewitt, the archæologist, described the house as "a goodly mansion at the north-west corner of the market-place." It was the residence and shop of Michael Johnson, the father of the doctor, and was in 1874 still "essentially the same structure." Michael Johnson was, says Mr. Hewitt, a bookseller, but was somewhat comprehensive in his dealings. He dispensed not only choice editions of Homer and Virgil, but "Last Dying Speeches" and quack medicines. Two doors away is the Three Crowns Inn, where Dr. Johnson put up when visiting Lichfield. He was there with Boswell in March, 1776, and the incidents of the visit are duly recorded in the great biography. In 1784 Johnson was in Lichfield for the last time. "While there," says Bothwell, "he felt the revival of all the tenderness of filial affection. The following circumstance, mutually to the honour of Johnson and the corporation of his native city, has been communicated to me by the Rev. Dr. Vyse from the town clerk: Mr. Simpson has now before him a record of the respect and veneration which the Corporation of Lichfield, in the year 1767, had for the merits and learning of Dr. Johnson. His father built the corner house in the market-place, the two fronts of which, towards Market and Broad Market Street, stood upon waste land of the corporation, under a forty years' lease, which was then expired. On the 5th of August, 1767, at a common-hall of the bailiffs and citizens, it was ordered (and that without any solicitation) that a lease should be granted to Samuel Johnson, Doctor of Laws, of the encroachments at his house, for the term of ninety-nine years, at the old rent, which was five shillings, of which, as town clerk, Mr. Simpson had the honour and pleasure of informing him, and that he was desired to accept it without paying any fine on the occasion, which lease was afterwards granted, and the Doctor died possessed of this property." Mr. J. W. Croker, commenting on these statements, expresses doubt as to Johnson's father having built the house, and affirms that the lease was only of the encroachment made by a shop window jutting out into the street.

Wraxall Church. THE members of the Axbridge branch of the Somerset Archæological and Natural History Society recently paid a visit to Wraxall and Tickenham. The first object of interest, after passing Clevedon Court and the new Clevedon water-supply, was Wraxall Church, which is dedicated to All Saints. Here some little time was spent in viewing the interior and exterior, and Mr. Ernest E. Baker, hon. secretary, read a paper. He said that the church had been recently restored. Mr. Ferrary, in 1881, said that the church was one of the finest in that part of Somerset, and was evidently originally a Norman foundation, although there was not much left which belonged to that date, the south doorway to the porch being the only Norman work remaining. There were traces of an Early English church, which must have been built afterwards, and the porch and parvise are of that period. The tower was a specimen of the middle of the Perpendicular period, of a very plain and massive type, the beautiful pinnacles built upon the buttresses being worthy of attention. There was a very fine tower arch, with remarkably good mouldings. There was a sanctus bell turret, which was not very usual in England. The feature of the greatest interest was perhaps the steps in the eastern wall of the porch, with respect to which different writers had different ideas. Its use was doubtless to accommodate the choir at different functions. On the north side of the chancel was the tomb of Sir Edmund and Lady Ann Gorges, dated 1512. The Gorges were lords of the manor of Wraxall for centuries. In the churchyard was a fine cross, well and carefully restored. The company next visited the Manor House, Tickenham. The church was found to be a building of much interest, comprising features of all styles of architecture, from the eleventh to the sixteenth centuries. Various other features of interest were described and inspected.

Exeter Architectural Society. AT the annual meeting of Exeter Diocesan Architectural and Archæological Society, held at Kenton, it was stated that there had been no public building of importance finished in Exeter or Devon that the committee were aware of during the past twelve months. The aim of the society was to prevent old buildings being altered and over restored. The church at Exbourne had had its nave restored, and the next portion of the work to be taken in hand was the nave seating. The old screen had been restored. Black Torrington Church restoration would soon be commenced. Sampford Courtenay Church had been reopened after a most successful restoration, and Inwardleigh Church had also been restored. There is a balance in hand of £32 6s. 11d. Officers were elected as follows: Patron, Bishop of Exeter; president, Hon. Mark Rolle; vice-presidents, Dean of Exeter, Chancellor Edmonds, Bishop of Crediton and Mr. J. Brooking Rowe; hon. secretaries, Rev. R. Medley Fulford and Mr. J. Jerman; hon. treasurer, Mr. J. T. Browne-Mason; curator, Mr. C. J. Tait; committee, Revs. W. P. S. Bingham, F. B. Dickinson, Roger Granville, W. Hope, O. J. Reichel and E. V. Freeman, Dr. Brushfield, Messrs. E. H. Harbottle, J. Newnham, Harbottle Reed, T. Kennet-Ware and A. J. Mackey. Mr. J. Newnham, A.R.I.B.A., read a paper on "Vestries," and notes were contributed on the excursions which took place last year by Rev. R. Medley Fulford. An inspection was afterwards made of the parish church, where the vicar read notes chiefly concerning the screen.

Winchester Lady Chapel. The Lady Chapel of Winchester Cathedral has lately undergone restoration. When Benjamin West's picture was removed from the great screen information was received that his countrymen desired to obtain it for their native land, and after a somewhat lengthened negotiation it was sold last summer to Mr. J. Pierpont Morgan for the sum of £1,500, and is now in New York. The chapter at once decided that this money should be expended upon the restoration of the Lady Chapel. The north window of the sanctuary, the only one not filled with stained glass, became the first charge on the funds, and the designs which Mr. Kempe had already prepared were carried out. The pavement of the entire chapel has been renewed, while the sanctuary floor has been laid with polished Ashburton and Dove marble. The delicate sixteenth-century woodwork of the stalls has been carefully cleaned and repaired, and the walls have been hung with drapery, that over the frescoes being, however, fixed to a hinged framework, so that any portion of the paintings can be easily examined. The fine kneeling figure of Bishop North, by Chantry, which had been inconveniently placed on the east wall, has been removed and refixed in the retro-choir, east of Bishop Waynflete's Chantry. The reredos will also be removed when funds are forthcoming for the carved and coloured oak triptych which it is desired to place there.

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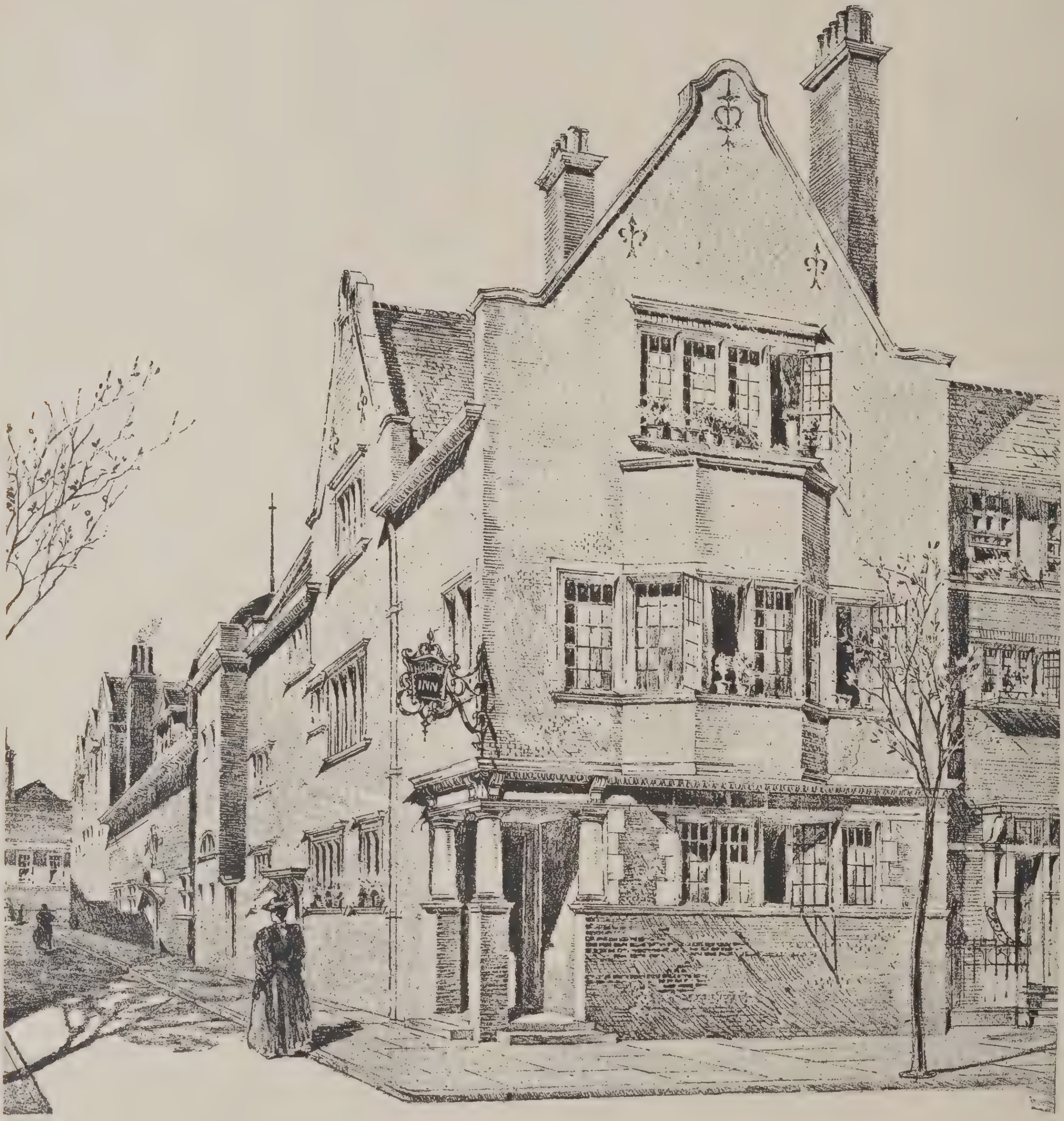

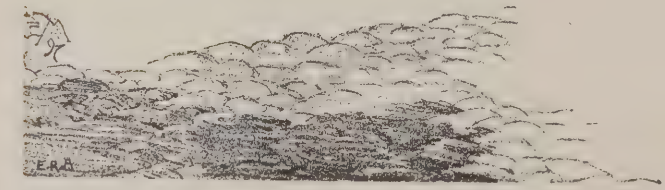

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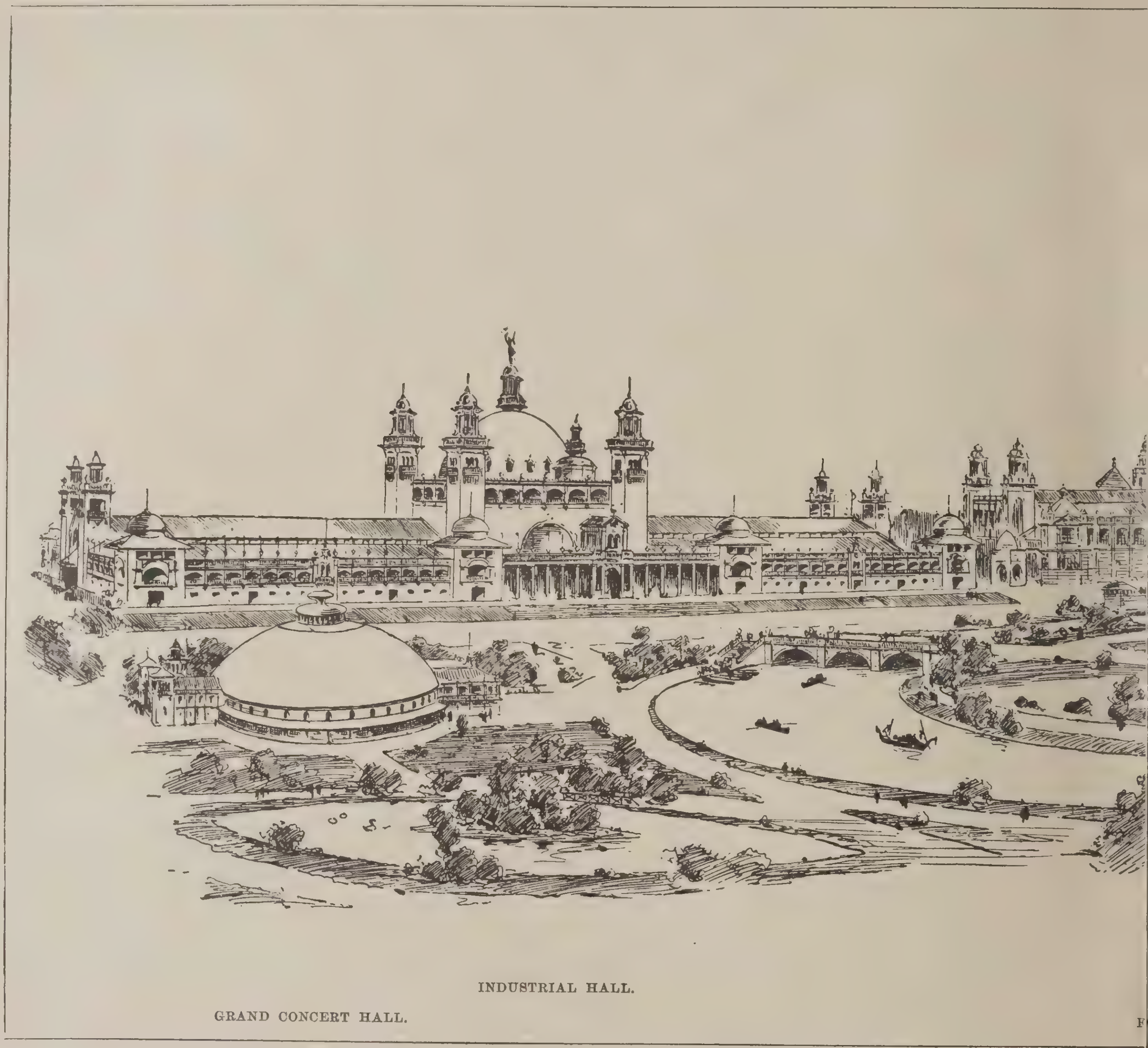
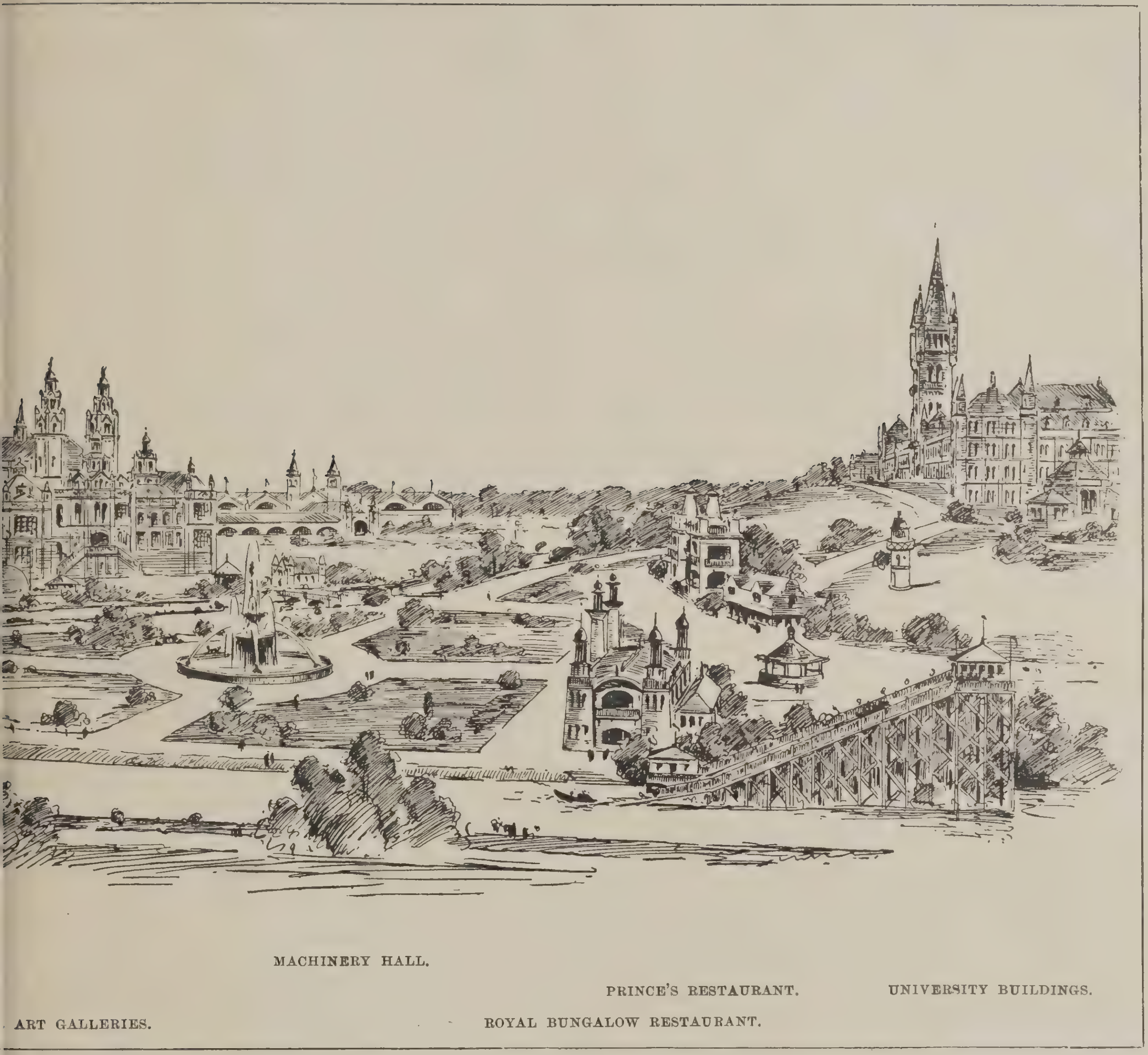

INDUSTRIAL HALL.
GRAND CONCERT HALL.

GENERAL VIEW OF THE GLASGO


MACHINERY HALL.
PRINCE'S RESTAURANT.
UNIVERSITY BUILDINGS.
ART GALLERIES.
ROYAL BUNGALOW RESTAURANT.

INTERNATIONAL EXHIBITION, 1901.

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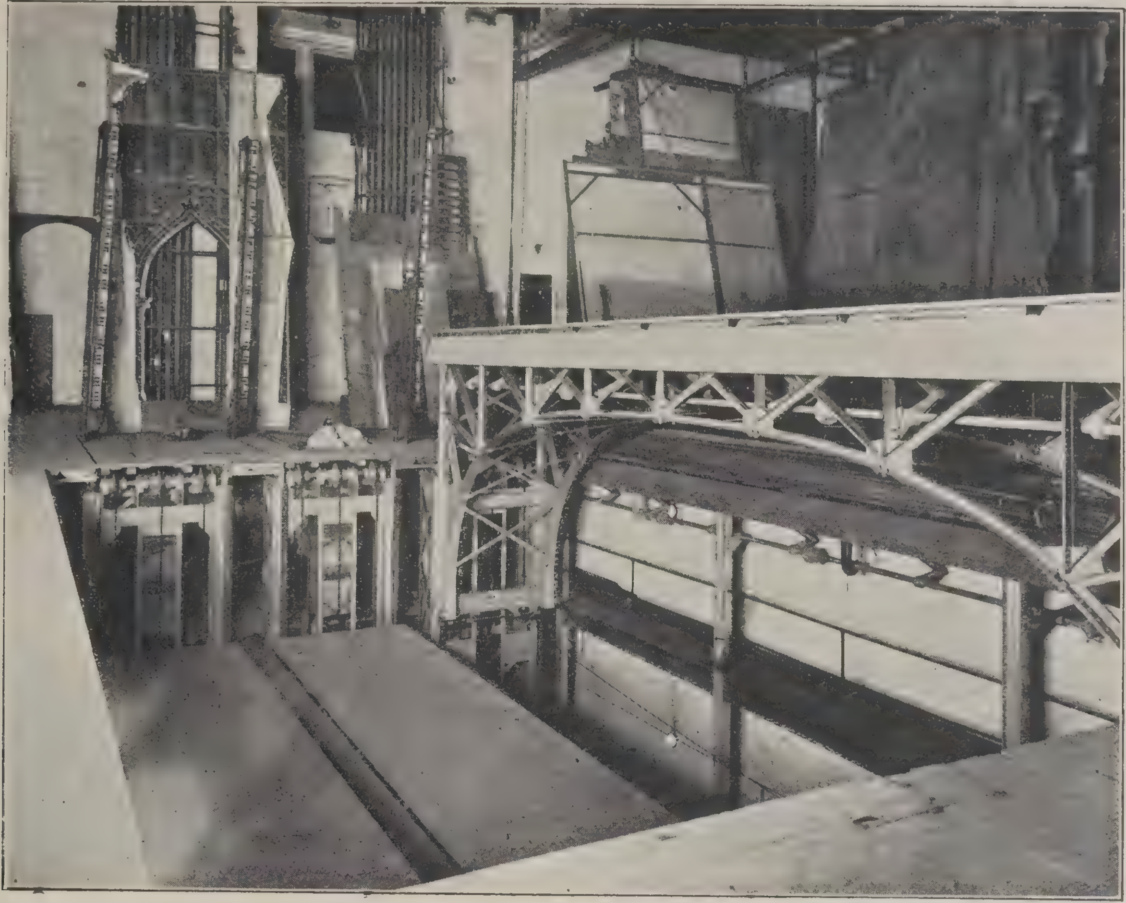

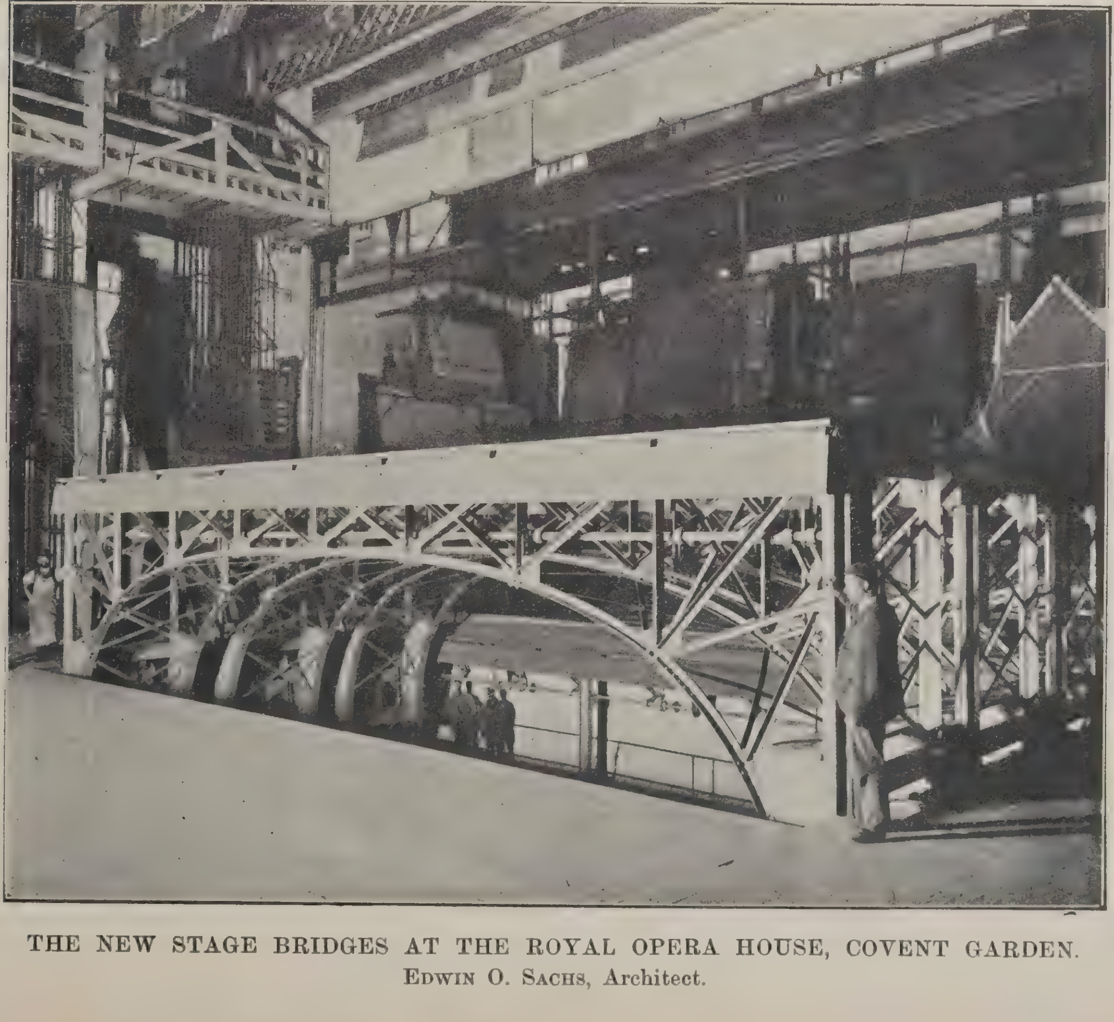

THE NEW STAGE BRIDGES AT THE ROYAL OPERA HOUSE, COVENT GARDEN.
Edwin O. Sachs, Architect.

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R. I. B. A.

PROFESSOR FLINDERS PETRIE ON EGYPTIAN ARCHITECTURE.

A MEETING of the Royal Institute of British Architects was held on Monday evening last, the chair being occupied by Mr. William Emerson (the president). Mr. Emerson referred with great regret to the death of Mr. Arthur Cates. Mr. John Slater, Mr. William Woodward and Mr. T. M. Rickman also spoke a few words respecting their deceased colleague, and it was decided that a vote of condolence should be sent to Mrs. Cates in her bereavement. Mr. Alexander Graham announced the decease of Mr. Ebenezer Gregg, who was elected a Fellow in 1870, and was one of the Board of Examiners. The Institute had sent a wreath to his funeral, and it was agreed that a letter of condolence should now be addressed to his relatives. Sir Lawrence Alma-Tadema was then received as an Hon. Fellow, after which Professor W. M. Flinders Petrie read his paper on "The Sources and Growth of Architecture in Egypt." He said that in no respect was our view of the origins of the arts more enlarged than in the architecture of Egypt. Ten years ago we were starting with the most highly-finished work of the Fourth Dynasty, the great pyramid of Khufu, and were groping in the dark for any clues to the growth of such surpassing construction. To-day it can be shown how every feature arose, and the adoption of stone for building can be dated to a single generation. The unwrought materials, which were everywhere to hand in Egypt, were palm-ribs, papyrus, reeds, maize-stalks and mud, together with palm-fibre roughly twisted. A striking sight of the

Beginnings of the Building Art

may be seen any day in a nomad settlement on the desert edge. Side by side stand (1) a black goat-hair Arab tent, long and low, open always on the leeward side; (2) a tent fenced along part of the open side with a row of maize stalks; (3) a tent fenced all round with maize; (4) a tent in a maize fence mud-plastered; (5) a dwarf wall of brick round the fence; (6) a high brick enclosure with a tent inside to roof it, the tent ropes stretching out through the wall; lastly, a roof is put on the wall, and the tent has disappeared.

The early Egyptians seem, however, to have usually roofed their reed huts with domed roofs, to judge from the engraving of a hut on ivory, at the rise of the First Dynasty (4800 B.C.). The next feature is the strengthening of the corners of the hut by placing at each angle a bundle of reeds lashed together, as seen in the hut on the mace of Narmer. Here we have the origin of the torus-roll down the edges of the buildings, used till the latest stage of the architecture. The lashing together was always retained as an ornament, although the meaning of the roll was long lost.

When papyrus stems were used for walling, instead of reeds or maize-stalks, the top was rather weak if stripped of its leaves; hence they were retained and bound together, and the feathery tops served as a barrier above the wall, and finally as an ornament.

Palm Ribs.

Besides these materials, palm-ribs may be seen still used for fences. They are set upright with all the leaves on them, at a few inches apart, and strengthened by other ribs interwoven diagonally each way; just below the weak part of the tip a line of ribs is lashed on with palm-fibre, and the loose nodding tips serve as an effectual barrier to men and animals. The whole is finally plastered with mud up to the top lashing, and forms a very strong fence, which will last for many years. Such a fence or wall is figured as the front of an early shrine hieroglyph in the Fourth Dynasty.

Translated into stone, this became the constant feature of every Egyptian building, and this cornice retained to late times the palm-leaf ribbing which proclaimed its origin.

We have preserved to us some views of simple shrines made of the natural materials, similar to the huts of maize-stalks still used by the peasant. Here we note the roof sloping backward, and carried on far before the open front, so as to cast a shade, while it is supported on two front pillars of stalks. This was the original type of the rustic shrine adopted as a hieroglyph, and preserved to us from the Fourth Dynasty.

Mud-Brick.

The next material to be noticed is mud-brick, one stage beyond the rough mud plastering. Brick houses and town walls remain from the prehistoric age, probably about 6000 B.C.; and a model of a town wall, with watchmen looking over it, belongs to a rather earlier time.

Regular brickwork developed in use in the prehistoric time, and some arched brick tombs are probably of this age. There can, however, be no doubt of the barrel-vaulted passage in the tomb of King Neter Khet (found this year) belonging to the beginning of the Third Dynasty (about 4200 B.C.), and the magnificent brickwork and arching of the Fourth Dynasty (about 3400 B.C.) shows a long familiarity and free use of it.

Coming to wrought materials, wood was the earliest in use for construction. The prehistoric graves were often lined with matting, and this was, in the later prehistoric, sometimes supplanted by a wooden lining. In the royal tombs at Abydos (4700-4500 B.C.) all of the wooden sides have been destroyed; but the evidences remain most clearly on the cross walls that were built to form cells around the wooden chamber for the offerings. These walls are plastered and whitewashed on the sides, but the ends are all rough brick, evidently built against a pre-existing timber wall, as the mud mortar has taken the cast of the grain of the wood wherever it touched it. The floors were usually of wood: one of the most complete shows the boards about 2in. thick, resting on beams at the sides and down the axis of the chamber. The roofing was also of wood, as in some cases the casts of the rough-hewn ends of the roofing beams remain in the brick walls of the chamber.

Construction of Early Tombs.

The author referred to the tombs of King Qa (4650 B.C.) and King Zet (4600 B.C.), and gave details of their construction. This form of construction is the forerunner of the greatest architecture of the pyramids. For the wooden chamber we find a stone chamber substituted, and the beams of the roof are of limestone or granite in place of wood. But the continuity of the general form and system is unbroken. The earliest royal tombs are plain pits roofed in, as in the pre-historic time. By 4650 B.C. a wooden lining forms a complete chamber, with brick cells around it, but no entrance. Under Den-Setni, 4600 B.C., an entrance stairway is added on the east side. Under Qa, 4500 B.C., the stairway is turned to the north. And the steps from this to the usual pyramid form a north entrance passage sloping down to a chamber is merely a change of material, but not of form or position. The external form of the mastaba tomb, from which the pyramid was developed (or rather *on* which the pyramid was superveloped) is exactly that of the rectangular mass of sand above the tomb, held in by the retaining wall of mud-brick, with a large external batter, as over the tomb of King Zet.

The author, having referred to the favourite lattice-work, the analogue of the mushrabiyéh work of Cairo, went on to trace

The Course of Stone-Working.

The first actual building of stone is the pit-chamber of King Khasekhemui, in the middle of the Eleventh Dynasty, about 4350 B.C. The limestone courses are tolerably regular, varying one or two inches either way. The faces of the blocks follow natural cleavages as far as possible; but most of the faces are hammer-dressed, and then adzed over to level them. The joints have plaster in them, and also spread over the open joints on the face. The same king also worked in grey granite, as two large building blocks with inscriptions of his have been found at Heirakonpolis and at El Kab. But building in limestone was still rare, and it is probably to the latter half of the Second Dynasty, about 4350–4200 B.C., that must be assigned a series of rough stone pyramids, which stand at El Amrah, Nubt and El Qula. These are all built of unhewn blocks found loose on the desert and cliffs. Each has successive faces of external finish, which have been coated over with added masonry.

The author next described the fine tomb of King Neter-Ket, probably second king of the Third Dynasty, about 4200 B.C.; the great stone pyramid of Saggara, probably of the same date; and the tomb of King Seneferu at Medum (4000 B.C.).

The Derivation of the Pyramid Structure.

It is important to see clearly how the pyramid structure is derived from the wooden tombs in unbroken succession, as it has by some been derived from the dolmen and chambered burrow. These structures are quite unknown in Egypt; whereas the continuous stages between the prehistoric pit-grave and the greatest and most accurate structure ever built are clearly traceable. Even the preparation for a pyramid remained just the same as for the wooden tombs of the First Dynasty.

The author concluded with some notes on the subject of pillars.

The wooden column appears as an octagon in the models found in the First Dynasty, and in the actual pieces he had discovered in the Twelfth Dynasty, and the copies of such in stone at Beni Hasan. The fluted wooden column is found copied in ivory in the First Dynasty tombs, and is well figured as a hieroglyph in the Fourth Dynasty.

The most peculiar form of column is that derived from the tent-pole. This was the origin of the strange form known as the inverted bell capital in the Eighteenth Dynasty at Karnak.

Lotus Columns.

The earliest example known of the lotus column is of the Fifth Dynasty (about 3600 B.C.). The later examples of the Twelfth Dynasty, of the Eighteenth Dynasty, and of the Nineteenth and Twentieth Dynasties show only a series of lamentable decadence. Each age in Egypt had its special excellence. In the Eighteenth Dynasty a delicate and freely flowing ornamental treatment; in the Fifth Dynasty the finest figure sculpture; in the Fourth Dynasty the grandest constructions; and in the First Dynasty the most lavish use of hard stones for hand objects and table furniture. Diorite, porphyry, and such materials were cut in thin and beautiful forms with a familiarity which was never known in later times. But every branch of art, when once it had fully grown, decayed rapidly, and the later work in every respect cannot bear comparison with the older triumphs.

The Discussion.

A discussion followed. Professor Aitchison moved a vote of thanks to Professor Petrie for his excellent paper. This was seconded by Sir Lawrence Alma-Tadema. Sir Martin Conway remarked that the development of Egyptian architecture was in direct contrast to the teaching of Ruskin, that forms particular to one material should not be copied in another. Greece had done the same as Egypt, and we might take the lesson to heart at the present time, when metal construction was superseding that of wood and stone. Dr. Murray, Mr. Phenè Spiers and Mr. Hugh Stannas also spoke.

In replying to questions, Professor Petrie said that the Egyptian construction was strictly indigenous, but he could not say the same of the art—that came from at least two different sources. Referring to the wood used, he said that the large beams had a straight grain and were probably of cedar brought from Syria, while the flooring boards were probably of acacia. As to the peculiar construction of town walls with horizontal courses between curved portions, he did not think that the earthquake theory accounted for them: we would need look in other directions for an explanation.

A Nameless Church.—According to a contemporary, a little church at Loudwater, in Buckinghamshire, which was erected in the year 1788, is nameless. The village was formed into a separate parish in 1866, but churchwardens have never been appointed either by the vicar or the parishioners; therefore no vestries are ever held. The church, which is in the diocese of Oxford, has never been dedicated to a patron saint.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Sanitary Inspectorship Examination.

Newcastle.—Coaly Tyne writes: "What books should be studied for the above examination? What is the full address of the Sanitary Institute?"

"Municipal and Sanitary Engineers' Handbook," by H. Percy Boulnois (Spon, 15s.); Reid's "Practical Sanitation" (Griffin & Co., 6s.); Coleman's "Sanitary House Drainage" (Spon, 6s.); Moore's "Sanitary Engineering" (Batsford, 30s. nett.), and Knight's "Annoted Model By-laws." We should advise you if possible to attend the courses of lectures held by the Sanitary Institute. Particulars can be obtained from the secretary of the Institute, Parkes Museum, Margaret Street, W.

Polish for Outside Signs.

Walsall.—Nemo writes: "Which is the best method of polishing signs, shop-fronts, &c., so that the weather will not affect the polishing?"

Good French polish is satisfactory, and can be relied upon for this kind of work. It is, of course, expensive, but good work must be paid for. The best carriage varnish is also suitable, and after careful application with a fine brush should be polished in with a piece of cloth.

Calculating Weight of Timber Beams.

Newcastle.—Formula writes: "Kindly answer the following question, taken from the R.I.B.A. Kalendar for 1901: 'The formula for calculating the weight which a timber beam will carry is $w = \frac{cbd^2}{l}$. What do you understand by this; and why does the strength of a beam vary as the breadth, while it varies as the square of the depth?' What do the letters in the formulæ stand for; and in what book can I find similar questions worked out?"

See Rivington's "Notes on Building Construction," Part IV., and Hurst's "Handbook of Formulæ." In the formula, w = breaking weight in cwts. in the centre; c = a constant found by experiment, varying for various materials; b = breadth in inches; d = depth in inches, and l = span in feet.

The Refusal of Plans by Local Authorities.

Nil Desperandum writes: "I am the owner of a piece of land upon which it is my intention to build a house, but the adjoining owners are doing all they can to prevent me. One of the interested owners is the chairman of both councils whose approval I require, and plans have been disapproved in both cases owing to the drainage. (1) Is there any way that I can proceed against the councils' decision? (2) Can I require the council to provide a means of drainage at my expense? (3) Can the adjoining district refuse to allow my drain to run under a turnpike road if I maintain same for twelve months from date of completion?"

(1) You can communicate with the Local Government Board and lay the details of your case before them. It is improbable, however, that any material advantage will result, as the local authorities appear to be acting strictly within their powers. (2) According to the particulars given, it is considered that there is no legal obligation on the part of the council to provide a means of drainage to your property. (3) Under the circumstances, the local authorities may decline to allow you to construct a drain as suggested. It is decidedly unfortunate that the public sewer near your property belongs to the adjoining district, but you cannot compel the sanitary authority of that district to receive your sewage into their sewers, seeing that your property is not liable for any rates levied by them. In some instances permission has been granted to an adjoining district or property owner to connect with the sewerage system of another district for an agreed consideration, but such an arrangement is entirely a matter of mutual convenience. Many local authorities also frequently sanction the construction of a cesspool considerably nearer to a proposed building than actually required by their by-laws, if the exigencies of the site necessitate it. Probably a courteous application to your own local sanitary authority would meet with similar consideration. T. E. C.

Standard Size for Eye-Bar.

V. W. writes: "Referring to the reply in regard to the standard size of eye-bars on page 244 of your issue for May 1st, would Professor Adams kindly explain further the three diagrams of Fig. 5? Is the middle diagram—the side view of the eye—intended for insertion between the double eye of the bottom diagram? I ask this because the former is marked $\frac{3}{4}$th diameter of rod, whilst the jaw of the latter equals the diameter of the rod."

The width between jaws of double eye was not dimensioned because it may have to take two or more bars, as frequently happens in roof construction. If it had to be used in conjunction with the single eye adjoining, the width between jaws would only need to be, say, $\frac{13}{16}$in.

HENRY ADAMS.

The Temple of Ceres.

New Brompton.—Bawbee writes: "Mr. Phenè Spiers says that the Temple of Ceres at Pæstum is the only Greek example where the end triglyph comes over the centre of the column, while Hamlin's 'Architecture' says the temple is in South Italy. Did the Greeks build in Italy, or is the temple a Roman one?"

Certainly, Greek colonists built in Italy, and the remains of their temples in Sicily and Magna Graecia rank with the earliest and most imposing examples of Grecian architecture. These remains can hardly, however, be regarded as typical of the work produced in Greece itself, presenting, as they do, many features quite abnormal, and which may not be entirely due to their extremely early date, but partly to the influence of a new environment.

Any manual of ancient geography will explain how Greek colonists settled in the western peninsula of Italy, and how they gradually subdued the inhabitants, until in the sixth and fifth centuries B.C. the whole of this part of the country became one in Greek speech and manners, and received the name of Magna Graecia. Later, in 400 B.C., the Greek supremacy was checked by the inroads of the Lucani, and the name of the country was changed to that of Lucania. Lastly, in 300 B.C., the country was joined to the Roman Republic.

One of the chief coast towns of Greek origin in Lucania, was Poseidonia, which after the Roman conquest became known under the Italian name Pæstum. Of the three temples still remaining at Pæstum, that known as the great hexastyle temple of Poseidon follows most closely the Grecian Doric type. It is the best preserved, yet probably the oldest of the three; it is decidedly archaic in style, and, unlike the others, it was covered with a thin coating of stucco. The other two temples are also Doric, and have strong archaic peculiarities; at the same time they exhibit such striking departures from the normal type that their age is still, we believe, somewhat uncertain. They have generally been referred to a time not far removed from that of the temple of Poseidon; others regard them as having been subject to Etruscan influence, in which case they may still be very early; while Wilkins thought they could not be dated earlier than the time of the Roman occupation.

Respecting the so-called temple of "Ceres"—the smallest of the three—the following peculiarities may be noted as indicating a late date. The architraves over the angle columns are mitred, or jointed diagonally, a mode that does not appear to have been practised by the Greeks; the placing of the triglyphs immediately over the axes of the angle columns is peculiar to the Romans; the absence of regulæ and guttæ on the architrave under the triglyphs; the triglyphs seem to have been got out of thin slabs and inserted in the solid frieze, thus reversing the usual Greek method of making the triglyphs solid blocks, and inserting the metopes as thin slabs; the columns of the pronaos, though fluted in the Doric manner and having Doric caps, are furnished with bases.

Above the level of the frieze the stonework had entirely disappeared 100 years ago, and all the triglyphs had dropped out of their grooves, with one exception. Piranesi, however, had made a drawing when the building was more complete, and subsequent restorations have been taken from it; in Piranesi's view the corona has no resemblance to the Grecian Doric; it has no mutules, but panels are sunk into the soffit instead. In view of the fact that the caps of the columns are quite archaic in profile, the building would—if late indate—be a remarkable instance of the archaistic style in architecture.

J. A. M.

Vitruvius, Vignola and Palladio.

New Brompton.—Bawbee writes: "Who were Vitruvius, Vignola and Palladio—my text-books give no particulars?"

Vitruvius was a Roman architect and engineer who lived in the reign of Augustus. Practically all that is known of him is from his treatise "De Architectura."

Barocchio Giacomo da Vignola was born at Vignola in 1507, and died in 1573. He succeeded Michel Angelo as the architect of St. Peter's, and erected numerous buildings in Rome and other parts of Italy. He wrote a well-known work on the Five Orders of Architecture.

Palladio was born at Vicenza in 1518, and died in 1580. He was one of the chief architects of his century, and erected numerous buildings in Vicenza, Venice and other parts of Italy. He wrote the famous work, "I quattro libri dell' Architettura," first published at Venice in 1570.

Biographies of these architects are to be found in the "Encyclopædia Britannica" and biographical dictionaries.

Setting-Out Roman Ionic Columns.

Harrogate.—Ionic writes: "Is there any rule for setting out the cap of a Roman Ionic pilaster, also for the column? Can you refer me to any word illustrating them; they are not in Gwilt or Phenè Spiers' books?"

Vitruvius and Palladio give rules for proportioning and setting out caps to Ionic columns and pilasters. For setting out the volute, see p. 477 of our issue for January 23rd and p. 25 of our issue for February 13th last. It would be preferable, however, to work by the eye and hand rather than by any rules.

Expansion Joint for Iron Gutters.

Oldham.—Mac writes: "Could you give me a figured sketch of an expansion joint for cast-iron gutters in 10ft. lengths?"

Expansion joints are not suitable for cast-iron gutters owing to the difficulty of making a watertight joint without obstructing the flow. When the length is such that the expansion would be excessive, a termination should be made and a fresh length started.

HENRY ADAMS.

Canterbury Cathedral.

Bawbee writes: "At the end of Bell's 'Canterbury' are given three plans showing the extreme east end of the cathedral to have been built after 1774. I have always understood it to be Transitional. Which is right?"

It is evidently a misprint for 1174. The actual date, I believe, is 1189. G. A. T. M.

Collar Beam Roof Truss.

Querist writes: "I send a sketch (not reproduced) of a collar beam roof truss, span 28ft. 3in., principals 8ft. apart. I am unable to find the stress on the part of the principal below the collar beam. Kindly state the method graphically, and whether the usual tie rods can be done away with. Walls are 14in., piers 18in. by $4\frac{1}{2}$in., floor to wall-plate 13ft.

In order to use the graphic method of calculation assume a tie at the foot of principals and proceed as usual; the stress for the tie will be that which the walls will require to give. This form of roof is not a good one for the span you propose. With heavy timbers and buttresses it can of course be made safe, but is wasteful and weak. We would suggest the use of tension rods and a king bolt with the collar beam.

Hurst's Handbook of Formulæ and Tables.

Devonport.—M. R. writes: "I wish to obtain a 'Handbook of Formulæ, Tables and Memoranda for Architectural Surveyors,' by John Thomas Hurst. Where can I obtain it?"

Hurst's Handbook has been many times revised, and the latest edition is quite up to date. It is an excellent book of formulæ and summarised information. It is published by Messrs. E. & F. N. Spon, Ltd., of 125, Strand, W.C., price 5s., and may be obtained either from the publishers or from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Position of Building Foreman.

Rufus writes: "What book would you recommend from which to learn how to take out quantities of buildings from the plans? Also, could you advise me in this: I am an apprentice to the carpentry and joinery trade, and am nearly out of my time. I served twelve months in an architect's office, and my aim is to become a clerk of works or a foreman. Do you think I could get a job with a big firm in London as a sub-foreman? I could give references."

We advise you to study Leaning's "Quantity Surveying" (E. & F. N. Spon; price 12s.). Sub-foremen are usually selected by the foremen from their men, and references count for little against personal knowledge of the applicant. The best plan would be for you to get a job as improver, or journeyman if you are sufficiently qualified, and by diligence you would be sure to secure the position in time; for experienced and trustworthy men are badly needed in the building trade. The conditions of employment are in this respect the same in the country as in London, and the latter should not be looked upon as offering any advantages over the former.

Effect of Lime on Cement.

Newbridge, Co. Kildare.—Subscriber writes: "Cement briquettes were made with water highly impregnated by lime. On testing them the necessary standard required by the department for whose approval they were tested was not reached. The standard necessary is 400lb. tensile stress per square inch sectional area. Out of four or five different cements of five briquettes of each the highest attained was only 350lb., lowest 125lb. Does the water affect the cement in any way so as to retard cohesion by reason of the lime being present, or could you suggest any cause for this failure? The cements have passed the tests on previous occasions in different places."

Lime water will weaken cement work. Lime makes the cement too "fat," and although it causes it to set quickly, it does so at the expense of strength. For this reason cements which set very quickly are generally very poor in strength. Portland cement, according to Le Chatelier, is chiefly composed of tricalcium orthosilicate, $3CaO,SiO_2$; tricalcium aluminate, $3CaO,Al_2O_3$; and tricalcium aluminoferrite, $3CaO,2(AlFe)_2O_3$, properly made cement containing no free lime. When water is added the calcium compounds are decomposed, forming, firstly, free calcium hydroxide, i.e., slaked lime; then follows the formation of crystalline hydrated calcium silicate and aluminate, the crystals of which form an interlaced mass, thus bringing about the setting of the cement. The setting takes place long before the formation of the hydrated crystals is complete, and as the action goes on the cement continually hardens. The setting and hardening of mortar, however, differ from Portland cement. Mortar made with lime first sets by loss of water; this causes the mortar to become porous, and the carbon dioxide of the air is absorbed, and the lime is slowly converted into calcium carbonate or chalk. In course of time the silica of the sand and the chalk form silicates, and these increase the hardness, but the action may take centuries to make any appreciable effect. Hydraulic limes contain alumina, and other, silicates in various proportions, and it is due to these that they have the property of setting under water. Hydraulic mortars are indeed often made by adding silicates to "fat" lime. Of course, lime alone would not set under water, as it would be dissolved or washed away, forming no crystalline structure, and this is aggravated with rainwater, which contains carbon dioxide or carbonic acid gas, as this latter increases the power of the water to dissolve chalk. It will thus be seen that free lime is deleterious to cement, tending as it does to weaken the interlacing crystalline structure which is the cause of the greater strength of cements.

Correspondence.

Examination Questions in Building Construction.

To the Editor of The Builders' Journal.

Sir,—Public attention is at present being directed to legislation upon secondary education, for which there is much need and much necessity for reform. Men and youths are urged to avail themselves of the opportunities offered for self-improvement, and, in response, from September onwards to April and May they may be seen (many of them five evenings per week) at the various polytechnics and technical institutes, foregoing alluring recreations and anxiously preparing to win certificates in the various public examinations. Such an examination, of the Board of Education—namely, Building Construction—was held on Saturday evening, May 10th, from 6 to 10, all over Great Britain. One would expect that the examiner, knowing for whom his questions were set—young architects, builders, surveyors, bricklayers, masons, carpenters, plumbers, painters, plasterers, &c.—would endeavour to word his questions as simply and as clearly as possible. But not so; his object appears to be to make the questions as ambiguous as he can, and to take the greatest amount of liberty with the syllabus of instruction definitely laid down for the guidance of the students. To give a simple comparison, students who should have been examined in Stage I. had questions from Stage III., and those in Stage II. questions from Stage IV.

Now I would ask, Is this the way to encourage young men to sacrifice their evenings and improve themselves? Surely an examination paper should be set to test a man's knowledge, not to air some eccentric foible of the examiners. I know there are thousands to whom this will appeal, and it is for this reason and to gain other opinions that I beg you will insert my letter in your valuable and well-circulated paper.—Yours truly, A STUDENT.

Standard Size of Eye-Bar.

To the Editor of The Builders' Journal.

London, E.C.

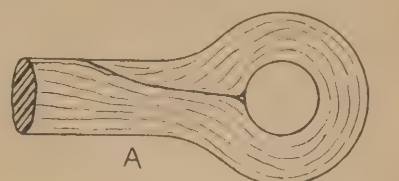
Sir,—Referring to the answer by Professor Henry Adams to "Roofs," on p. 244 of your issue for May 1st, when using Carnegie's tables it must be remembered that these are for eyes made of one particular kind of steel and for pins made of another kind of steel, both recommended as best for their particular respective purposes. The sizes given are what are kept in stock; which of those are best for the particular purpose of the constructor is for the latter to determine. He can then purchase the eye ends and weld them on to his bars or rods.

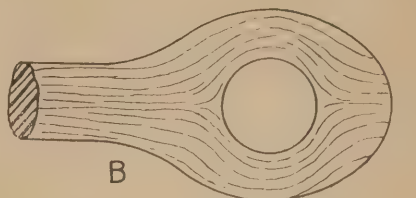
Would Mr. Adams state his formula for finding the size of pin to utilise the strength of the rod in the case of the three diagrams of Fig. 5, and state what the figures on the top diagrams mean? Are they inches and fractions of inches, giving rod diameter 1in., pin diameter $1\frac{1}{4}$in., widths at sides of eyes $\frac{5}{8}$in., width at crown 1in.; or are they to represent proportional sections in terms of the diameter of rod, the latter being taken as unity? In neither case can I come to the same results by the use of Shaler-Smith's tables, which he quotes. Perhaps I may be wrong. Would he kindly set out his calculation, when, perhaps, I may return to the subject? If it is meant that the diameter of the rod is 1in., then its sectional area is approximately ·8in., and the sectional area of the sides of eye taken together twice $\frac{5}{8}$in. by $\frac{3}{4}$in., or, say, twice ·62 by ·75 = ·93. Shaler-Smith says that their combined sections should be $1\frac{1}{2}$ times the section of the rod, which for an inch rod with eye $\frac{3}{4}$in. thick would require a width at each side of the eye of ·8 or $\frac{8}{10}$, instead of $\frac{5}{8}$ as shown. The width of the crown of the eye, given as 1, is likewise open to question; but I do not propose to enter further into the matter now, pending possible explanations and corrections.—Yours truly, A. H.

To the Editor of The Builders' Journal.

Sir,—Referring to above letter, my diagrams were not based upon any formula of my own, but simply recorded the proportions adopted by various reliable investigators. The dimensions are in terms of the diameter of rod, so that for any given diameter of rod, say, $1\frac{1}{2}$in., all measurements will be multiplied by $1\frac{1}{2}$. Fig. 4 is the only one mentioned as of the Shaler-Smith type, referring to the shape of the eye as contrasted with English practice, shown by Fig. 3. The shape of the end would also depend upon the mode of forging. For instance, Fig. 1 would be suitable for eyes made by welding, as at A, and Fig. 5 for eyes formed out of the solid, as at B, the fibres being approximately in the position shown by the lines.—Yours truly,

HENRY ADAMS.





PERTH'S NEW GASWORKS.

The New Gasworks at Friarton, Perth, were opened recently. The new works occupy an area of about four and a half acres, and are situated on sloping ground between the River Tay and Edinburgh Road. The gas-holders which supply the lighting district are midway between the new works and the city. The initial capacity of the works is equal to a make of one million cubic feet of gas per twenty-four hours, and the works are capable of being extended within the boundary walls to at least three times that quantity without change of existing plant. Entering the gates, on the right are general stores and workshops, on the left are the offices, laboratory, coal-testing room, and the sulphate of ammonia plant; in front, to the right, in one large building in two spans of roof, are the retort-house and coal-store. The coals are taken into the store by a high level railway carried on steel girders and concrete piers, the waggons are emptied into a coal-breaking machine, and, after the coal is broken to a uniform size, it is carried by elevator buckets to the overhead hoppers placed on each side of the retort house. The retort bench consists of seven double ovens placed back to back, each oven containing eight retorts 22 by 16—112 in all. The ovens are worked from two floors, the upper being used for charging and drawing the retorts, and the lower for removing the coke and ashes. The exhausters, combined with their steam engines, are in duplicate, and are each capable of passing 30,000 cubic feet of gas per hour. The contractors employed on the works were: Excavator, brickwork, &c., Mr. T. P. Jamieson, Baillieston, near Glasgow; carpenter and joiner work, Mr. William M'Quibban, Perth; slater work, Messrs. William Brand & Son, Arbroath; plumber work, Mr. James MacLeisch, Perth; plaster work, Mr. Alexander M'Ritchie, Dundee; painter and glazier work, Messrs. G. R. Douglas & Son, Perth; iron and steel roofing, railway girders and tank, Messrs. H. Balfour & Co., Ltd., Leven, Fife; retort bench, brick and ironwork, elevator, coal breaker, floor and charging machinery, Messrs. West's Gas Improvement Company, Ltd., Manchester; condensers and purifiers, Messrs. Clapham Brothers, Keighley, Yorks; exhausters and engines, Messrs. Bryan, Donkin and Clench, Ltd., London; station meter, gauges, &c., Messrs. John Milne & Son, Ltd., Edinburgh; sulphate plant, Messrs. R. & J. Dempster, Ltd., Manchester; boiler and heater, Messrs. Babcock and Wilcox, Renfrew.

Surveying and Sanitary Notes.

New Lavatories in Aberdeen.—The Aberdeen Town Council propose to construct a lavatory in the vicinity of Torry Harbour, at a cost of £400; another near Wellington Suspension Bridge, between Menzies Road and Wellington Road, at an expenditure of £425; and one lavatory in Hutcheon Street, opposite the new Dead Meat Market.

The Cleethorpes Improvement Scheme, which is estimated to cost about £25,000, and which includes the extension of the promenade and other developments along the south foreshore, is slowly progressing, and has been advanced by the action of the Sidney Sussex College, in accepting the offer by the Urban Council of £1,000 for the golf links, which cover an area of about thirty-three acres. The sea-wall is to be extended from the end of the Great Central Railway Company's promenade. The golf links are to be converted into a public park.

Mr. W. Bennett Rogers, the newly-elected president of the Auctioneers' Institute, is the founder of the well-known West End firm of Messrs. Rogers, Chapman and Thomas. Educated in France and at Brighton College, Mr. Rogers gained considerable experience in land surveying and valuing in Bedfordshire, and in 1866 commenced business in London. In the course of his career Mr. Rogers has had valuations not only in most parts of this country, but also in France, and he has had the development of not a few large estates, notably that of Westgate-on-Sea. A well-known figure at the Auction Mart, Mr. Rogers also has acted for many years and in various capacities for the royal family of France.

A City Improvement.—The Chancellor of the Diocese of London held a sitting of the Consistory Court recently for the purpose of hearing an application for a faculty under which power was sought to effect an important City improvement. The place concerned was the churchyard of the united parishes of St. Andrew-by-the-Wardrobe and St. Ann, Blackfriars. The churchyard fronts on to the Blackfriars end of Queen Victoria Street. At present the churchyard is shut off from view by means of a blank wall. This presents a rather unsightly appearance, and for some time past it has been felt desirable to make an alteration and improvement. The proposal is to lower the blank wall to about 2ft. in height, surmount this with iron railings and lay the churchyard itself out in garden terraces. There are some human remains in the churchyard, and these remains the church authorities proposed to place in a vault, which would afterwards be hermetically sealed. The cost of the work is estimated at £450. After hearing evidence, the Chancellor said he had inspected the church and churchyard, and, after having seen the plans, he was of opinion that the work when completed would be a great improvement both to the church and churchyard and to Queen Victoria Street.

A Central Highways Department.—The Roads Improvement Association, an incorporated body which has been in existence since 1886, has issued a pamphlet advocating the establishment of a Government department to deal with highways. The pamphlet says: "The increase in road traffic and the development of new means of locomotion have made the reform of the existing system of administration imperative. There are local authorities who take the view that traffic must accommodate itself to the existing roads. These reactionary ideas have found expression in resolutions favouring restrictions upon the use of bicycles, autocars and other forms of rapid traffic. These attempts to retard progress are unlikely to commend themselves to Parliament and to the public. The roads must be adapted to meet the demands of the traffic—that is to say, the existing roads must be widened where necessary, and new ones, suitable for rapid traffic, built . . . Unfortunately, under the existing system of administration, little can be done to provide better and wider roads. Since the abolition of the Turnpike Acts, no new main roads connecting distant towns have been made. The machinery for widening existing roads is so expensive and so cumbersome that very few local authorities can be induced to put it into operation on any large scale. Under all these circumstances, the Roads Improvement Association has determined to bring organised pressure to bear upon Parliament and the Government to amend the existing system of administration. And the moment is a propitious one. There is little doubt that the present system of local taxation will, in any event, be revised, and the relations existing between the central and local authorities reviewed, upon the issue of the final report of the Royal Commission on Local Taxation. The opportunity will therefore be afforded to ear-mark a portion of the Imperial subventions to local rates for the purposes of road maintenance, and to establish a certain measure of central control. . . . . A general improvement can be most readily affected through a central department directly responsible to Parliament. The maintenance of roads is the only important duty of national importance which local authorities are now left entirely unaided to discharge."

New Companies.

Ashover Stone Co., Ltd.

Registered May 3rd to acquire the business now carried on at Ashover, Derby, by Mrs. M. A. Wigglesworth as the Ashover Stone Co., and to carry on the business of quarry owners, stone merchants, &c. Capital £2,000 in £1 shares.

Portable Building Co., Ltd.

Registered April 30th to acquire the business of the Portable Building Co., and to carry on the business of builders of portable buildings of every description, general engineers, bricks makers, builders, contractors, &c. Capital £10,000 in £1 shares.

New London & County Building & Estates Co., Ltd.

Registered May 7th to acquire any freehold, leasehold and copyhold property and buildings, and to carry on the business of builders and contractors, estate agents, dealers in building materials of every description, capitalists, &c. Capital £5,000 in £1 shares. The first directors are G. Porter, C. W. Scott, P. C. Webb and F. Summerfield.

Bellerby Syndicate, Ltd.

Registered May 4th to adopt an agreement with J. W. Gibson and others to purchase, deal with and turn to account any freehold, copyhold and leasehold lands and buildings, and to carry on the business of builders and contractors, &c. Capital £1,000 in £1 shares. The first directors are R. W. Simpson, T. Metcalfe, F. H. Bennett, J. Airey and J. Peterson.

Blyth Brick Co., Ltd.

Registered May 3rd to acquire the business of brick, tile and terra-cotta makers now carried on by the Blyth Brick Co., and to carry on the business of brick, tile and terra-cotta manufacturers and merchants, cement manufacturers, clay workers, &c. Capital £10,000 in £1 shares. The first directors are D. Crichton (managing director) and R. T. Gray. Registered office: Link Road Works, Blyth, Northumberland.

John Horsford & Co., Ltd.

Registered May 6th to acquire the business, property and effects of the late firm of J. Horsforth & Co., and to carry on the business of manufacturers of and dealers in bricks, tiles, pipes, flints, manures, coal and coke merchants, builders and contractors, &c. Capital £20,000 in £1 shares. The first directors are Mrs. E. Seager, Mrs. E. Chrisfield, Mrs. M. A. Ersdaile and M. H. Seager. Registered office: The Brickworks, Oare, Kent.

Abertbaw Hydraulic Lime Co., Ltd.

Registered May 1st to acquire the business now carried on at Porth Kerry, Glamorganshire, as the Aberthaw Hydraulic Lime Co., to adopt an agreement with E. T. Ferrier, T. R. Thompson and I. Alexander, trading as the Aberthaw Hydraulic Lime Company, and generally to get and make marketable building stone, limestone, &c. Capital, £2,500 in £1 shares. The first directors are I. Alexander, T. R. Thompson, E. T. Ferrier and J. B. Ferrier.

TRAIN BRAKE REFUSED TO ACT.

The failure of a brake to work promptly caused rather a nasty accident at St. Pancras Station last week.

A train from Luton came up to No. 6 platform, and the driver applied the brake, but it refused to act. The consequence was that about a dozen passengers sustained cuts and bruises, two of the number being so seriously hurt that they had to be taken to the Royal Free Hospital.

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Sainfoin mixture	do.	3 15 0	4 12 6
Clover, best	do.	4 5 0	5 2 6
Straw	do.	1 8 0	1 16 0

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Colza Oil, English	do.	1 1 0	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 4 9	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do.	1 0 4½	—
Linseed Oil, barrels	do.	1 13 6	—
Petroleum, American	per gal.	0 0 6¼	0 0 6½
Do. Russian	do.	0 0 5¾	0 0 5⅞
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	2 18 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt	per cwt.	1 4 6	1 5 6
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	1 7 6	—

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Do. Galvanised Corrugated sheet	do.	11 0 0	—
Lead, pig, Spanish	per ton	12 2 6	12 5 0
Do. do. English common brands	do.	12 17 6	—
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17 9 0	—
Do. pipe	do.	18 3 0	—
Nails, cut clasp, 3in. to 6in.	do.	12 0 0	13 0 0
Do. floor brads	do.	11 15 0	12 15 0
Steel, Staffs., Girders and Angles	do.	6 0 0	6 5 0
Do. Mild Bars	do.	7 0 0	7 10 0
Tin, Foreign	do.	123 15 0	124 5 0
Do. English ingots	do.	127 0 0	—
Zinc, sheets, Silesian	do.	21 0 0	—
Do. do. Vieille Montaigne	do.	21 10 0	—
Do. Spelter	do.	17 12 6	18 2 6

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load	3 0 0	4 0 0
Pine, Quebec Yellow	do.	4 7 6	6 0 0

TIMBER—cont.

			£ s. d.
Pine, Pitch	per load	2 9 0	3 0 0
Laths, log, Dantzic	per fath.	4 10 0	5 10 0
Do. Petersburg	per bundle	0 0 9	0 0 10½
Deals, Archangel 2nd & 1st	per P.Std.	9 5 0	12 10 0
Do. do. 4th & 3rd	do.	11 15 0	13 5 0
Do. do. unsorted	do.	—	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	21 0 0	—
Do. do. 2nd „	do.	19 0 0	—
Do. do. unsorted	do.	12 15 0	—
Do. do. White	do.	9 10 0	11 5 0
Do. Swedish	do.	9 15 0	11 0 0
Do. White Sea	do.	9 15 0	13 0 0
Do. Quebec Pine, 1st	do.	22 0 0	23 0 0
Do. do. 2nd	do.	19 15 0	—
Do. do. 3rd &c.	do.	13 10 0	—
Do. Canadian Spruce, 1st	do.	12 5 0	—
Do. do. 3rd & 2nd	do.	9 5 0	10 0 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	6 5 0	10 0 0
Flooring Boards, 1in. prepared, 1st	per square	0 13 3	—
Do. 2nd	do.	0 9 6	—
Do. 3rd &c.	do.	0 8 6	—

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
May	24	Halifax—Houses	—	M. Hall, Architect, Halifax.
„	24	London, N.W.—Additions	Willesden District Council	O. C. Robson, Public Offices, Dyne Road, Kilburn, N.W.
„	24	Aylesbury—Convenience	Urban District Council	J. H. Bradford, Surveyor to the Council, Town Hall, Aylesbury.
„	24	Barrow-in-Furness—Shops	Co-operative Society, Ltd.	J. W. McIntosh, Architect, Cornwallis Street, Barrow.
„	24	Bedlinog, Wales—Houses	Workmen's Building Club	W. C. Morgan, 10 Edward's Terrace, Bedlinog.
„	24	Burnopfield, Durham—Farm Buildings	—	Estate Office, Gibside Hall, Burnopfield.
„	24	Dewsbury—Parsonage	—	J. Kirk & Sons, Architects, Dewsbury.
„	24	Harrington, Cumberland—Houses	J. McNeil	W. G. Scott & Co., Victoria Buildings, Workington.
„	24	Llangollen—Sheds, &c.	Urban District Council	Surveyor, Llangollen.
„	24	Richmond, Yorks—Houses, &c.	—	S. Coates, Frenchgate, Richmond, Yorkshire.
„	24	Thurlstone, near Sheffield—Schools	School Board	E. W. Dyson, Architect and Surveyor, Horwich.
„	24	Trealaw, Rhondda, Wales—Houses	—	E. Jones, Architect, Porth.
„	25	Halifax—Houses	—	C. F. S. Horsfall & Son, Architects, &c., Lord St. Chambers, Halifax.
„	25	Newcastle-on-Tyne—Materials	Guardians	J. W. Gibson, Union Offices, Pilgrim Street, Newcastle-on-Tyne.
„	25	Garlands, Carlisle—Renewal of Sanitary Fittings, &c.	Committee of Visitors	G. D. Oliver, County Architect, Carlisle.
„	25	Horsham—Warehouses, &c.	—	W. Buck, Architect, Horsham.
„	25	Killucan, Ireland—Ceiling, &c.	—	Rev. P. Cantwell, Parochial House, Killucan, co. Westmeath.
„	25	Llanlluan, Wales—Chapel	—	J. W. Jones, Architect, Gwily House, Llandilo.
„	25	Northtawton, Devon—Cottages	W. Madge, Blagdon Court, Ashwater	Madge Bros., Great Cocktree, Spreyton, Bow.
„	25	St. Anne's-on-Sea—Fire Station	Urban District Council	Surveyor's Office, Park Road, St. Anne's-on-Sea.
„	25	Salisbury—Chimney Shaft	Urban Sanitary Authority	A. C. Bothams, City Surveyor or Municipal Offices, Salisbury.
„	25	Siddick, Cumberland—Houses	St. Helen's Colliery Co., Ltd.	Company's Offices, Station Road, Workington.
„	25	Bamford, via Sheffield—Bricks and Slates	Derwent Valley Water Board	E. Sandeman, Engineer, Bamford, via Sheffield.
„	27	Semington, Wilts—Additions, &c.	Guardians of Union	W. W. Snailum, Church Street, Trowbridge.
„	27	Oldcastle—Repairs	Rural District Council	T. F. Jenkins, Clerk of Council, Oldcastle Workhouse.
„	27	Burgos, Spain—Market Buildings	—	Commercial Department, Foreign Office, Madrid.
„	29	Holne, Devon—Reservoir, &c.	Paignton Urban District Council	F. W. Vanstone, Palace Chambers, Paignton.
„	29	Newcastle-on-Tyne—Workshops, &c.	Steam Shipping Co., Ltd.	W. Hope & J. C. Maxwell, Trinity Buildings, Newcastle.
„	29	Craigydon—Schools	Llandudno School Board	G. A. Humphreys, Llandudno.
„	29	Framlingham, Suffolk—School	—	Brown and Burgess, Princess Street Chambers, Ipswich.
„	29	Llandudno—Schools	School Board	C. A. Humphreys, Llandudno.
„	30	Coedfranc—Boys School	School Board	J. C. Rees, St. Thomas' Chambers, Neath.
„	30	Draycott, near Derby—Isolation Hospital	—	F. S. Antliff, Architect, Draycott.
„	30	Kilburn, N.W.—Branch Public Library	Hampstead Borough Council	C. H. Lowe, Borough Surveyor, Town Hall, Haverstock Hill, N.W.
„	30	Kingstown, Ireland—Generating Station	Urban District Council	Town Hall, Kingstown.
„	30	Skewen, Wales—School	Coedfranc School Board	J. C. Rees, St. Thomas's Chambers, Neath.
„	30	Sunderland—Church, &c.	—	J. J. Green, 19 South John Street, Liverpool.
„	30	Tonbridge, Kent—Electric Light Building	Urban District Council	R. Hammond, Consulting Engineer to the Council, Tonbridge.
„	30	London, S.E.—Covered Way	Guardians	G. D. Stevenson, 13 & 14 King Street, E.C.
„	31	West Hartlepool—School Buildings	School	School Board Offices, Park Road, West Hartlepool.
„	31	Portreath—Buildings	—	Portreath Coast Guard Station, Portreath.
„	31	Inishtrahull Island—Schoolhouse, &c.	—	Corbett, Lloyd's Agent, Slipquay Street, Londonderry.
„	31	Wrexham—Reboarding	—	R. J. Kendrick, Clerk, Wrexham.
„	31	Middlesbrough—Bricks	Stores Committee	B. Wintersgill, 42 Commercial Street, Middlesbrough.
une	1	Farnborough, Kent—Mortuary and Post Mortem Room	Bromley Union Guardians	J. Ladds, 7 Doughty Street, Mecklenburg Square, W.C.
„	3	Gloucester—School	School Board	M. H. Medland, 15 Clarence Street, Gloucester.
„	3	Penlee Point, Cornwall—Fog Signal House	—	Coast Guard Station, Cawsand, Cornwall.
„	3	Denbigh—School Buildings	—	A. Foulkes-Roberts, Clerk to the Governors, Denbigh.
„	3	Kingston-on-Thames—Boiler House	Guardians	W. H. Hope, Architect and Surveyor, Hampton Wick.
„	4	Winchester—Additions to Public House, &c.	Welsh & Co., Ltd.	T. Stopher, 57 High Street, Winchester.
„	4	Aldershot—Buildings, &c.	Urban District Council	N. F. Dennis, Council's Surveyor, Aldershot.
„	12	Draycott, near Derby—Isolation Hospital	Shardlow Isolation Hospital Committee	F. S. Antliff, Architect, Draycott.
		ENGINEERING:		
ay	24	Wivenhoe, Essex—Waterworks	Urban District Council	Sands & Walker, Angel Road, Nottingham.
„	24	Dewsbury—Pumping Plant	—	C. H. Marriott, Son & Shaw, Church Street Chambers, Dewsbury.
„	24	Corunna—Tramway Concession	Spanish Ministry of Agriculture	Commercial Department, Foreign Office Corunna.
„	25	Carlisle—Waterworks	Corporation	C. B. Newton, Engineer, Victoria Viaduct, Carlisle.
„	25	Manchester—Trackwork, &c.	Tramways Committee	J. M. M'Elroy, 55 Piccadilly, Manchester.
„	25	Bournemouth—Bridge	Town Council	F. W. Lacey, Municipal Offices, Bournemouth.
„	27	Manchester—Siphan Outlets on Aqueduct	Waterworks Committee	G. H. Hill & Sons, Albert Chambers, Albert Square, Manchester.
„	27	Uttoxeter—Footbridges	Rural District Council	J. Preston, Surveyor, Woodlands, Uttoxeter.
„	28	Northam Bideford—Concrete Wall, &c.	Urban District Council	W. G. Champion, Surveyor, Northam.
„	28	Epsom—Water Supply	Rural District Council	Council Surveyor, Waterloo Road, Epsom.
„	29	Syra, Greece—Dry Dock	—	Greek Consul-General, Eastcheap Buildings, E.C.
„	29	Paignton, Devon—Waterworks	Urban District Council	F. W. Vanstone, Palace Chambers, Paignton.
„	30	Kingstown, Ireland—Electric Lighting Plant	Urban District Council	J. Donnelly, Town Clerk, Town Hall, Kingstown.
„	30	Tonbridge, Kent—Plant	Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
„	31	Milton, Stirlingshire—Reservoir, &c.	County Council	Warren and Stuart, 94 Hope Street Glasgow.
une	1	Christiania—Materials	Government	Afdelingsingeniörens Kontor, Arendal Aamli Banen, Arendal.
„	3	Dublin—Plant	Corporation	S. Harty, City Hall, Dublin.
„	3	Madrid—Tramways	Spanish Government	Commercial Department, Foreign Office, Madrid.
„	3	Salford—Reconstruction of Bridge	Corporation	C. S. Allott & Son, 46 Brown Street, Manchester.
„	3	Kingston-on-Thames—Boilers	Workhouse Guardians	W. H. Hope, Architect, Hampton Wick.
„	5	Melton Mowbray, Leicester—Waterworks	Urban District Council	Latham, Parliament Mansions, Victoria Street, Westminster.
„	6	London, N.W.—Wiring	Hendon Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
„	8	St. Petersburg—Embankment	—	St. Petersburg Town Council (Stadtamt).
„	8	Rio de Janeiro—Electrical Machinery	Brazilian Government	Commercial Department, Foreign Office, S.W.
„	10	Egremont, Cheshire, Widening, &c., Ferry Pier	Wallasey Urban District Council	Ferry Manager, Egremont Ferry, Cheshire.
„	10	Rochford, Essex—Water Mains, &c.	Rural District Council	J. Mansergh, 5 Victoria Street, Westminster.
„	13	Exeter—Electrical Plant, &c.	City Council	H. D. Munro, City Electrical Engineer, Exeter.
„	15	Newcastle-upon-Tyne, Dredges, &c.	Tyne Improvement Commissioners	R. Urwin, Secretary, Bewick Street, Newcastle-upon-Tyne.
„	18	London, S.W.—Steam, &c., Piping	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„	25	Cairo—Engines, &c.	—	Inspector-General of Irrigation, Upper Egypt, Cairo.
ug.	1	Manila—Harbour	—	Commercial Department, Foreign Office, Manila.
ec.	10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL:		
May 25	Bamford, via Sheffield—Iron, Steel, Ironmongery, &c.	Derwent Valley Water Board	E. Sanderson, Engineer, Bamford.
,, 25	Walsall—Iron	Corporation	Gas Office, Bridge Street, Walsall.
,, 27	Edinburgh—Cast-iron Main Pipes	Gas Commissioners	W. R. Herring, Gasworks, New Street, Edinburgh.
,, 27	Manchester—Cast-iron Pipes, &c.	Waterworks Committee	G. H. Hill & Sons, Albert Chambers, Albert Square, Manchester.
,, 28	Kyleakin, Skye—Pipes	———	J A. H. Mackenzie, Architect and Surveyor, Portree.
,, 31	Middlesbrough—Stores	Stores Committee	B. Wintersgill, 42 Commercial Street, Middlesbrough.
June 1	South Kirkby, nr. Wakefield—Lamp Columns, &c.	Parish Council	Clerk to Council, South Kirkby.
,, 3	Salford—Steel Poles, &c.	Corporation	Lacey, Clivehugh & Sillar, 2 Queen Anne's Gate, Westminster.
,, 11	London, S.W.—Rails, &c.	Queensland Railways	Queensland Government Office, 1 Victoria Street, S W.
July 1	Calcutta—Bins	Corporation	Chairman of Corporation, Calcutta.
	PAINTING AND PLUMBING:		
May 25	Barrow-in-Furness—Painting at Schools	School Board	W. Hutchinson, Clerk, Board's Offices, Barrow-in-Furness.
,, 29	Hull—Cleansing and Painting Police Stations	Corporation	J. H. Hirst, City Architect, Town Hall, Hull.
,, 29	London, S.W.—Cleaning and Re-decorating Library	Fulham Borough Council	F. T. Barrett, Central Library, 592 Fulham Road, S.W.
,, 31	Middlesbrough—Oils, Paints, Lead, &c.	Stores Committee	B. Wintersgill, 42 Commercial Street, Middlesbrough.
June 3	Halifax—Colouring and Painting Schools	School Board	W. H Ostler, 22 Union Street, Halifax.
,, 4	Tanfield, Durham—Painting, Colouring, &c. School	School Board	W. H. Ritson, Clerk, Manchester.
,, 5	London, E.C.—Painting Central Meat Market	Corporation	Surveyor, Guildhall, E.C.
,, 18	Preston—Painting, &c., Cattle Market	Corporation	Borough Surveyor, Town Hall, Preston.
Aug. 5	Cleckheaton—Interior Renovation of Church	———	Wesleyan Church, Whitcliffe Road, Cleckheaton.
	ROADS AND CARTAGE:		
May 24	Wisbech—Materials	Walsoken Urban District Council	J. Kerridge, Club Chambers, Old Market, Wisbech.
,, 24	Basingstoke—Steam Road Rolling	Rural District Council	H. W Chandler, Clerk, Wote Street, Basingstoke.
,, 25	Copford, near Colchester—Materials	Rural District Council	J. Ennals, Surveyor's Office, Copford, near Colchester.
,, 25	Huntingdon—Granite	County Council	E. Borrisson, County Surveyor, Huntingdon.
,, 25	Staines—Kerbing and Paving	Rural District Council	G. W. Manning, Surveyor, London Road, Ashford, Staines.
,, 27	Stratford-upon-Avon—Road Metal	Town Council	R. Dixon, Borough Surveyor, Municipal Offices, Stratford-upon-Avon.
,, 27	Uttoxeter, Staffs.—Materials	Rural District Council	J. Preston, Surveyor, Woodlands, Uttoxeter.
,, 27	Woodford, Essex—Tar Paving Repairs	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green.
,, 27	Carshalton—Making-up Road	Urban District Council	C. P. Lovelock, Clerk, Offices, High Street, Carshalton.
,, 28	Sowerby Bridge, Yorks.—Paving, &c.	Urban District Council	Surveyor, Towns Buildings, Sowerby Bridge.
,, 28	London, N.W.—Road-making & Paving Works	Willesden District Council	O. C. Robson, Public Offices, Dyne Road, Kilburn, N.W.
,, 29	Havana—Sewering and Paving	Military Governor	Commercial Department, Foreign Office, Havana.
,, 29	Erdington, nr. Birmingham—Making-up Avenue	Urban District Council	H. H. Humphries, Public Hall, Erdington.
,, 29	Thame, Oxon—Broken Granite	Urban District Council	W. Parker, 2 High Street, Thame.
,, 31	Little Woolton, Liverpool—Macadam	Urban District Council	R. Simmons, Grange Lane, Gateacre, nr. Liverpool.
June 1	Saffron Walden, Essex—Granite Macadam	Corporation	A. H. Forbes, Borough Surveyor, Saffron Walden.
,, 3	London, S.E.—Materials	Bermondsey Borough Council	R. J. Angel, Borough Surveyor, Town Hall, Spa Road, S.E.
,, 3	Royston—Kerbing, Paving, &c., Footpaths	Herts County Council	U. A. Smith, 41 Parliament Street, S.W.
,, 4	Leyton—Steel Works	Urban District Council	W. Dawson, Council's Surveyor, Town Hall, Leyton.
,, 4	Maidstone—Materials	Urban District Council	F. Bunting, Surveyor, Fair Meadow, Maidstone.
	SANITARY:		
May 25	Pole Moor, nr. Huddersfield—Draining Cemetery, &c.	———	J. Kirk & Sons, Architects, Huddersfield.
,, 25	Alford, Lincs.—Sewers, &c.	Urban District Council	F. Massie, Tetley House, Wakefield.
,, 25	Bamford, via Sheffield—Lime, Pipes, &c.	Derwent Valley Water Board	E. Sandeman, Engineer, Bamford.
,, 27	Rhymney, Wales—Sewerage Works	Urban District Council	Surveyor, 61 High Street, Rhymney.
,, 29	Erdington, nr. Birmingham—Sewers	Urban District Council	H. H. Humphries, Public Hall, Erdington, Birmingham.
,, 31	Middlesbrough—Sanitary Lime	Stores Committee	B. Wintersgill, 42 Commercial Street, Middlesbrough.
June 3	Billericay—Stoneware Pipe Sewers	Rural District Council	B. Denton, Son & Lawford, Palace Chbs., 9 Bridge St., Westminster.
,, 5	Seaford—Sewage Outfall Pipe	Urban District Council	B. A. Miller, 3 Clinton Place, Seaford.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
May 27	Aldershot—Schools	———	N. Clinton, Clerk to the Board, Station Road, Aldershot.
June 8	Buxton—Water Pump	£20, £10, and £5	W. H. Grieves, Town Surveyor, Town Hall, Buxton.
,, 10	Ennis, co. Clare—Additions, &c. to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
,, 24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100	W. H. Talbot, Town Clerk, Town Hall, Manchester.
,, 24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
,, 30	Hereford—Municipal Buildings	£100, £75, £50	J. Carless, Offa Street, Hereford.
July 31	Manchester—Fire Station and Police Station	£300, £200 and £100	W. H. Talbot, Town Hall, Manchester.
No date	Hinckley—Club Premises	———	J. Blakesley, Burbage Road, Hinckley.

ROBERT ADAMS, 65 & 67, NEWINGTON CAUSEWAY, LONDON, S.E.

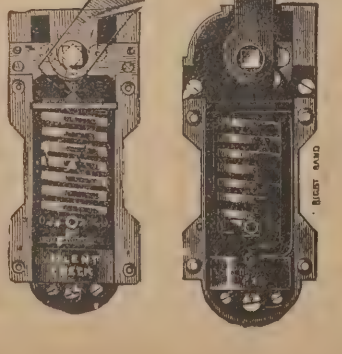
THE BEST TESTED BUILDING SPECIALITIES.

DOOR SPRINGS, FANLIGHT OPENERS, GEARING, WEATHER BARS, PANIC EGRESS BOLTS, METAL CASEMENTS AND SASHES, REVERSIBLE WINDOW FITTINGS, ETC. *60 Highest Awards in Competition.*

The "Victor" Double Action Spring Hinges. THE BEST.

The Best Overhead Pneumatic Silent Check Door Spring, the "Empress Victor."

Greatest Variety of Fanlight Openers and Gearing in the World.



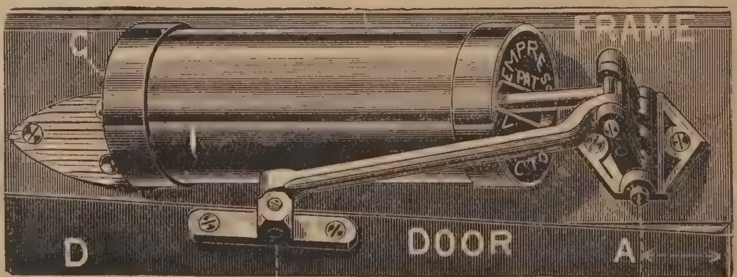


Fig. 1, as fixed on face of door.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ABINGDON (BERKS).—For the erection of three houses and shops at Abingdon, for Mr. F. G. Sheldon. Mr. Herbert Quinton, architect, 22 George Street, Oxford:—

Kingeslee & Sons, Oxford	£2,587
Thatcher & Sons, Abingdon	2,512
J. Wooldridge, Oxford	1,738
W. H. Randall,* Abingdon	1,590

* Accepted.

CHATHAM.—For the supply, construction, and fixing of the steel superstructure, girders, rough platforms, and cast-iron parapets required in erection of a new bridge at Chatham, and of the approaches thereto, for the Town Council:—

Horsley Company, Limited, Staffs	£4,566	11	6
A. Handiside & Co., Derby	4,208	16	0
M. Shaw & Co., London	4,203	0	0
T. Westwood & Co., London	4,084	0	0
Darlington Engineering Co., Darlington	4,041	0	0
M. Shaw & Co. (own design)	3,974	0	0
Pierson & Co., London	3,749	0	0
F. Morton & Co., Garston (Contracts 1, 2, and 3 only)	3,547	15	0
E. C. & J. Keay, Limited, Birmingham*	3,351	0	0
W. A. Baker & Co., Newport, Mon. (Contract No. 1 only)	2,500	0	0
Goddard, Massey, & Warner, Nottingham (Contract No. 1 only)	1,780	0	0
Sommervail & Co., Glasgow (Contract No. 1 only)	1,673	0	0
W. Macfarlane & Co., Glasgow (Contract No 4 only)	713	10	0
Sheepbridge Iron Company (Contract No. 4 only)	530	0	0

* Accepted.

HEREFORD.—For the erection of cottages in Edgar Street for the Hereford Dwelling Company, Limited. Mr. G. H. Godsell, F.S.I., architect, Palace Chambers, Hereford:—

W. T. Lewis & Co.	£1,849
C. Cooke	1,836
J. Davis	1,830
W. Bowers & Co.	1,772
H. Davies	1,730
E. W. Wilkes	1,701
W. Powell	1,617
Davies & Co.,* The Barton	1,586

[All of Hereford.]
* Accepted.

HUNSTANTON (NORFOLK).—For the erection of Florence Villa, for Mr. Alfred Jermyn. Mr. Herbert J. Green, architect, 31, Castle Meadow, Norwich.—

A. W. Barnes, Lynn	£2,504	14	2
W. H. Brown, Lynn	2,308	9	0
Fredk. Giddings, St. Ives	2,235	2	8
Hill & Horsley, Lynn	2,068	5	7
Solden Hipwell, Wisbech	1,974	0	0
Reuben Shanks, Chatteris	1,870	0	0

LONDON.—For works at Greenwich Divisional Offices site, for the London School Board. Mr. T. J. Bailey, architect:—

E. P. Bulled & Co.	£2,900
Johnson & Co.	2,837
J. & C. Bowyer	2,780
J. Appleby	2,700
H. Wall & Co.	2,695
J. Smith & Sons, Limited	2,664
F. & H. F. Higgs	2,656
Kirk & Randall	2,612
Holliday & Greenwood, Limited*	2,588

* Recommended for acceptance.

LONDON.—For works at Haseltine Road School, for the London School Board. Mr. T. J. Bailey, architect:—

J. Garrett & Son	£9,442
Kirk & Randall	9,095
W. Johnson & Co., Limited	8,796
E. Lawrance & Sons	8,782
E. P. Bulled & Co.	8,671
F. & H. F. Higgs	8,636
Holliday & Greenwood, Limited	8,395
J. & C. Bowyer	8,353
W. J. Mitchell & Sons*	7,828

* Recommended for acceptance.

LONDON.—For rearranging and refitting with separate pans the boys' and infants' offices in the playground, and girls' offices on roof playground; providing necessary drains for baths and lavatories, wastes, &c. in connection with proposed industrial school and new drainage scheme at Ponton Road School, for the London School Board. Mr. T. J. Bailey, architect:—

G. Kemp	£2,316	0	0
W. H. Lorden & Son	2,222	0	0
Johnson & Co.	2,142	0	0
R. P. Beattie	2,088	9	5
Peattie Bros.	1,988	10	0
H. Leney*	1,880	0	0

* Recommended for acceptance.

LONDON.—For improvements at Saunders Road School, for the London School Board. Mr. T. J. Bailey, architect:—

Stimpson & Co.	£16,003
Lathey Bros.	15,629
W. Antill & Co.	15,394
Leslie & Co., Limited	15,291
Martin, Wells, & Co.	14,574
W. H. Lorden & Son*	13,222

* Recommended for acceptance.

LONDON.—For works at Rotherhithe New Road School, for the London School Board. Mr. T. J. Bailey, architect:—

J. Appleby	£2,160
E. P. Bulled & Co.	1,996
T. L. Green	1,985
Holliday and Greenwood, Limited	1,966
J. Marsland & Sons	1,950
W. Downs	1,945
Maxwell Bros., Limited	1,850
W. V. Goad	1,825
E. Triggs*	1,790

* Recommended for acceptance.

LONDON, N.—For the erection of 10 detached houses in Shepherd's Hill, Highgate, for the Freehold and Leasehold Investment Company, Limited. Mr. Eugene C. Beaumont, architect, 78, Fleet Street, E.C.:—

T. Boyce	£25,858
Roome & Co.	22,917
Adamson & Sons	21,264
Lawrence & Sons	20,322
H. Brown	19,833
Grover & Son*	19,734

* Accepted.

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J. Fidder, Eckington	4,500	0	0
H. Burrows & Son, Barnsley	4,166	14	0
J. Holmes, Clay Cross, near Chesterfield	4,152	14	0
J. E. Nadin, Sheffield	4,100	0	0
G. Hall, Sheffield	3,985	10	0
G. Webster,* Sheffield	3,900	0	0

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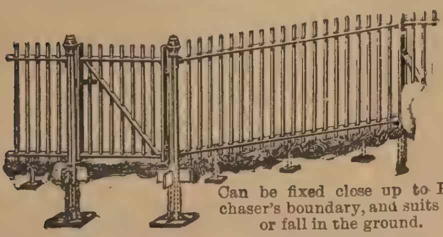

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F. L. Jones, Wolverhampton	£5,983
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W. Inger, St. James's Street	1,286
Parnell, Sneinton Dale	1,260
G. A. Pillatt, Parliament Street	1,195
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COMING EVENTS.

Wednesday, May 22.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS (Birmingham Local Section).—Discussion on Mr. A. C. Eborall's paper on "Some Notes on Polyphase Substation Machinery," 7.30 p.m.

Thursday, May 23.

SOCIETY OF ARCHITECTS.—Mr. H. H. Richardson on "Building Contracts," 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

ROYAL INSTITUTION.—Professor Dewar, F.R.S., on "The Chemistry of Carbon," I., 3 p.m.

CARPENTERS' HALL, LONDON WALL (Lectures on Carpentry and Joinery).—Mr. E. J. Burr on "Timber Houses," 7.30 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS (Dublin Section).—Annual General Meeting. Mr. W. Tatlow on "The Arrangements of Accumulators in a Small Installation," 7.30 p.m.

Friday, May 24.

ROYAL INSTITUTION.—Mr. R. T. Glazebrook, F.R.S., on "The Aims of the National Physical Laboratory," 9 p.m.

Saturday, May 25.

ROYAL INSTITUTION.—Prof. W. M. Flinders Petrie on "The Rise of Civilization in Egypt," III., 3 p.m.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Visit to the Royal Masonic Schools at Bushey at 3 p.m.

Monday, May 27.

GLASGOW INSTITUTE OF ARCHITECTS.—Council Meeting at 2 p.m.

Tuesday, May 28.

ARCHITECTURAL ASSOCIATION.—Valedictory Address by the President, Mr. Frederick Batchelor, F.R.I.B.A., and election of officers, 7.45 p.m.

Wednesday, May 29.

SOCIETY OF ARCHITECTS.—Meeting to ascertain the attitude of Scottish Architects on the Architects' Registration Bill, at the Burgh Court Room, City Chambers, Edinburgh, 6 p.m.

Thursday, May 30.

SURVEYOR'S INSTITUTION.—Country Meeting at Southampton (First Day).

GLASGOW INSTITUTE OF ARCHITECTS.—General Meeting at 2 p m.

SOCIETY OF ARCHITECTS.—Meeting to ascertain the attitude of Scottish Architects on the Architects' Registration Bill, at the Philosophical Society's Room, 207, Bath Street, Glasgow, 6 p.m.

Friday, May 31.

SURVEYOR'S INSTITUTION.—Country Meeting at Southampton (Second and last Day).

Saturday, June 1.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visits to The Round Tower, Abernethy, and Balmano Castle.

Monday, June 3.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Business Meeting: Annual Elections.

SURVEYORS' INSTITUTION.—Annual General Meeting at 3 p.m.

SOCIETY OF ENGINEERS.—Ordinary Meeting at 7.30 p.m.

Tuesday, June 4.

GLASGOW ARCHITECTURAL ASSOCIATION.—Annual Business Meeting.

Wednesday, June 5.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

Thursday, June 6.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m. Ballot for the Election of Fellows.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Second Conversazione at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

ROYAL INSTITUTION.—Professor Dewar, F.R.S., on "The Chemistry of Carbon," II., 3 p.m.

Saturday, June 8.

NORTHERN ARCHITECTURAL ASSOCIATION.—Outdoor Meeting at Hexham.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Council Meeting at 1.30 p.m. General Meeting at 2 p.m.

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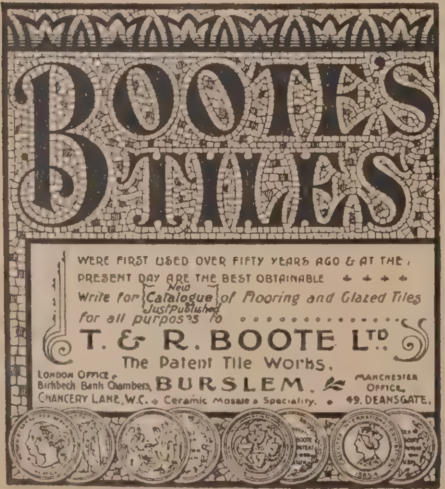

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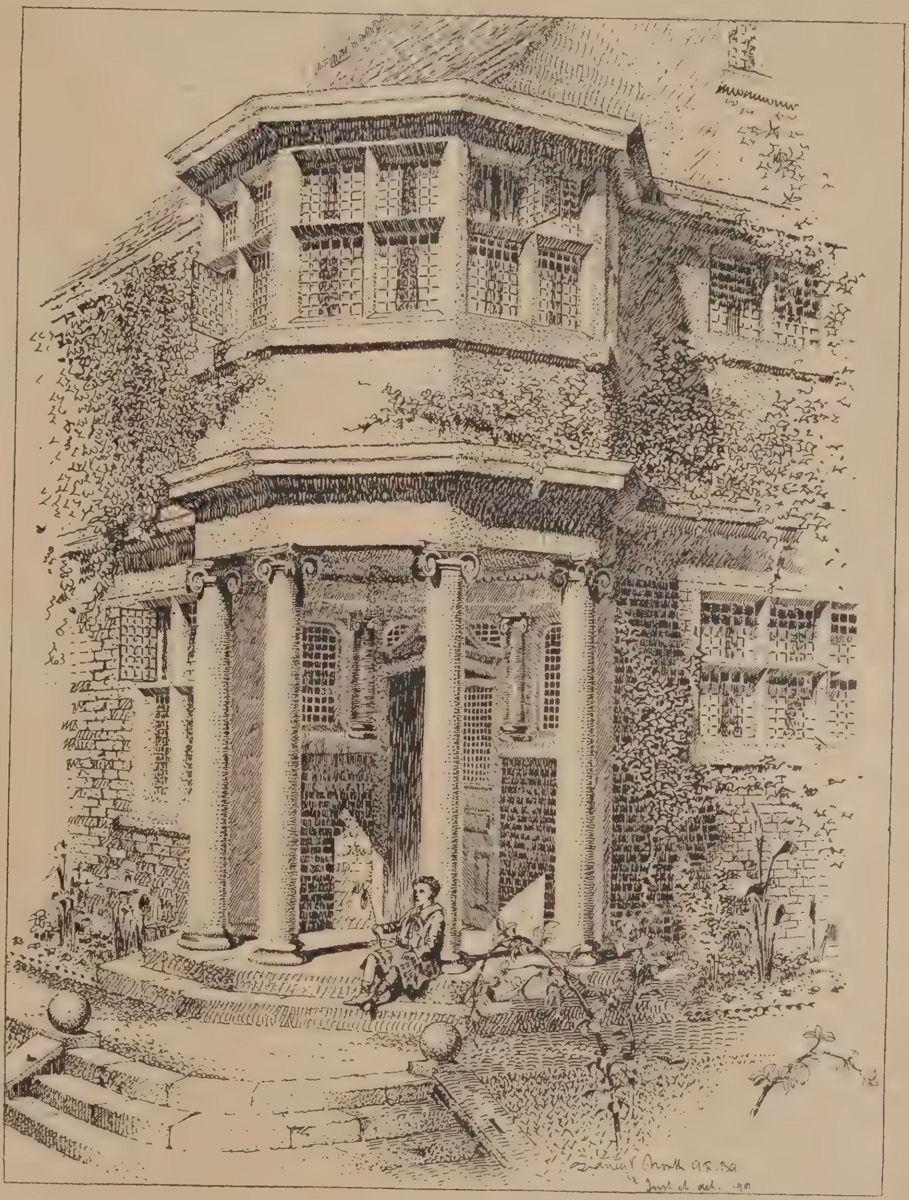
An Architectural Causerie.

Madame Du Barry's Hotel. THE French Government seem to be as indifferent as our own to the value of historical buildings. It appears that the hotel of Madame du Barry at Versailles, which is at present in the occupation of the commandant of the garrison, is about to be put up to public auction by order of the administration of public lands. Apart from the interest attached to the building as the residence of a person who played an important part in the contemporary history of France, it is also valuable as a work of art, the front having been designed by Jacques-Ange Gabriel (1719–82), the architect to the French Admiralty, who built the old garde-meuble, or storehouse, and the military school of Paris. To destroy a fine building, says a French contemporary writer, is as blamable as to destroy a fine picture or a beautiful statue, considering the rarity of such buildings. The Commission des Monuments Historiques appear to have taken no steps to prevent the possible demolition of the building.

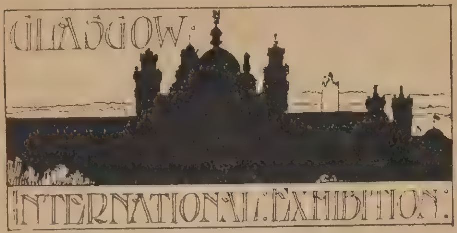
Changes in the Strand. THE changes which have already been effected in the Strand, those now in progress, and those to be made in connection with the new thoroughfare, will combine to give this world-known artery a totally different aspect. The neighbourhood of Charing Cross preserves its accustomed appearance, but a little way eastwards one sees the huge new front of the Hotel Cecil (erected from Mr. Sawyer's designs) now approaching completion; almost opposite, work is in progress for the addition of a tower to the Adelphi Theatre; at the bottom of Catherine Street a great clearance has been effected preparatory for the new street; while further east the graveyards of St. Mary-le-Strand and St. Clement Dane's are being cleared in order to give additional width to the thoroughfare. All these alterations have greatly changed the appearance of the Strand, which is now of a splendid width in several parts. Another improvement is to be effected by the construction of a new northern approach to the Savoy Hotel. The narrow precipitous approach by way of Beaufort Buildings is to be widened from 23ft. to 40ft., and levelled up, so that the hotel entrance will be level with the Strand instead of far below it. The front of the hotel is to be advanced 20ft., and, with the 17ft. gained by the widening of the Strand, this will bring the hotel about 35ft. nearer that thoroughfare. The houses facing the Savoy Theatre have been acquired, and will be replaced by an extension of the hotel and a spacious courtyard. It is possible that ultimately the hotel may have a frontage on the Strand, like the Cecil, which was a pet scheme of Mr. D'Oyly Carte.

Metal Construction. IT is an architectural axiom that any material can be used for building, provided it is suitable; and there is consequently no justification for opposing a new material simply because it is new, because it is unlike what has hitherto been employed. In tracing the evolution of architectural forms we find that the earliest are direct copies from Nature, the form gradually altering—for the better or worse—according to the abilities and environments of its adaptors. We find, for instance, that in the early dynasties of Egypt the lotus column very closely resembled the lotus bud, with the bands of papyrus and slender stems which constituted the prototype of what we now see at Luxor and Karnak. But in the later dynasties the form became debased, just as in Roman times Greek forms were debased, and features were exaggerated out of all regard to their original derivation. It will be noticed, however, that natural forms were first copied in wood; that wood forms were preserved in stone (such as the wedges in metopes); and, following the same sequence, stone forms might be continued in metal. This, however, is not defensible, as the qualities of the one material are totally different to the qualities of the others. In our own day we have witnessed the increasing employment of steel and iron in buildings and bridges, a change regarded by many as utterly deplorable. Novelty is no criterion of excellence; but iron and steel have proved eminently suitable to the needs of the architect and the engineer, and the fact that the bulk of the metal construction around us is so devoid of beauty does not argue that the fault lies with the material: rather it is with its users. Iron bridges are generally ugly, but it does not follow that they are bound to be so. It is not probable that metal will ever entirely replace stone as a building material, because of its conductivity; but that it will be still more extensively used in the future is certain. This can be legitimately done, and it is futile to abhor the material because of the abuse to which it is subjected.



DESIGN FOR A PORCH. BY SIDNEY V. NORTH, A.R.I B.A.

A Porch Design. THE porch by Mr. Sidney V. North, A.R.I.B.A., illustated on this page, is intended for the garden entrance to a small residence in a situation where it would not be exposed to winter winds. The columns, cornice, &c., are intended to be in pitch-pine, the carved caps in mahogany and the whole of the remainder painted white.



With Special Sketches by J. Jeffrey Waddell.

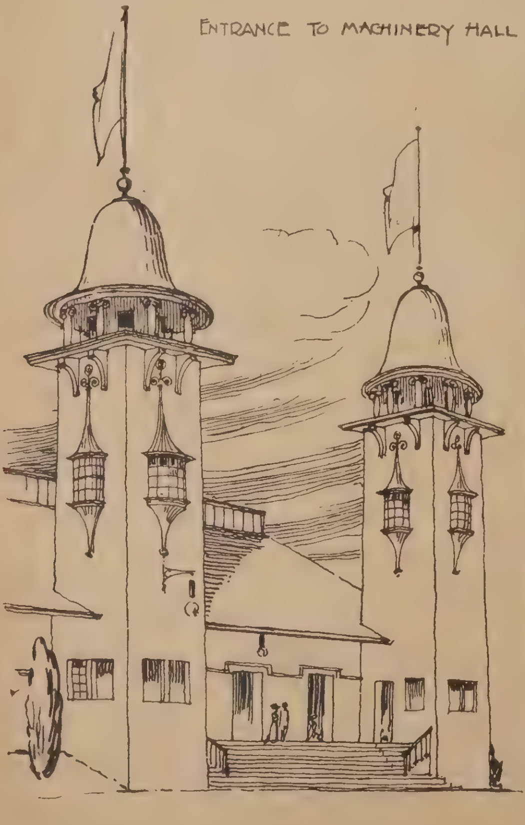
(Concluded from p. 294 of No. CCCXXVIII.)

THE great Machinery Hall represents most vividly the active forces of modern life. It is connected with the Industrial Hall and the Art Galleries by a covered corridor called the Grand Avenue. This is 1,000ft. long, 75ft. wide and 40ft. high, formed of semicircular laminated wood arches carrying a glass roof supported on iron astragals.

From the end of the Grand Avenue a roofed-in bridge, crossing over Dumbarton Road, leads direct into the Machinery Hall. This is a rectangular building, covering 175,000 sq. ft., and containing about 250 stands of machinery and ironwork under one roof. The arrangement of the hall is by Mr. Thomas Young, M.I.M.E. The floor space is divided into sections by frequent passages running at right angles lengthwise and crosswise, so that every stand is easily accessible, and a vast multitude of visitors may inspect the machinery at the same time without crowding or obstruction. Galleries also run overhead and permit an extensive bird's-eye view from above.

The plan of the Machinery Hall is admirable, and could not be improved upon; but the metal work is devoid of the interest of beauty, and one sighs for the combination of constructive and decorative skill which constituted the steel girder construction of the roofs, staircase and galleries of the Grand Palais in Paris, an example of twentieth-century architecture of the first order. The importance of money in this connection must not, however, be forgotten. Such matters as plan and construction are, after all, of minor importance in buildings of this nature compared with external effect, and in this respect they may be said to be entirely successful.

Only one structure in the Exhibition is permanent—namely, the new Art Galleries, which are, in a sense, a legacy from the last Exhibition. Messrs. Simpson & Allen were the architects. A start was made with a sum of £40,000, representing the surplus profits of 1888, and the buildings have been completed at a total cost of about £250,000. The materials used in these galleries are the handsome Locharbriggs red stone outside, and the Glasgow Giffnock white stone for the interior. There is a central court and two wings east and west, with galleries running all round, the whole very ample, spacious and dignified. Mr. F. H. Newberry, the headmaster of the Glasgow School of Art, has arranged the exhibits of sculpture and architecture, and Mr. R. W. Allan has done similar duties in regard to the pictures. The central court (125ft. by 56ft.) is devoted to sculpture, and the special feature of the collection is that it is the first representative exhibition of British sculpture ever held. There are examples of foreign artists—M. Rodin, for example—but the collection is essentially British, and it contains most of the finest work, either in originals or copies, that has been produced in recent years, No one interested in British art should miss it. Of the two wings (each 102ft. long), the western is devoted on the ground floor to Scottish antiquarian and historical objects; the eastern to architecture, art objects and photography.


ENTRANCE TO MACHINERY HALL

· CORBEL · UNDER · PILASTERS ·

Of the sculpture exhibited the bronze statue of Queen Victoria by Mr. George Frampton, A.R.A., which is temporarily situated at the entrance to the galleries, on its way (or out of its way) to Calcutta, draws the greatest attention. Of considerable interest, too, in view of the sculptor selected for the Queen Victoria Memorial, are the two examples of the work of Mr. Thomas Brock, R.A., namely, his statue "Eve" and his bust of the late Lord Leighton. Mr. E. Onslow Ford is represented by half a dozen pieces, including his "Shelley Memorial," the recumbent figure of the poet drowned, his Huxley, Irving and "Echo." Mr. Alfred Gilbert, R.A., has two original statuettes, "Perseus Arming" and an "Offering to Hymen," both lent by Mr. J. P. Heveltine, as well as a bronze head, the property of his fellow Academician, Mr. Luke Fildes. An attractive show of work by Mr. Andrea C. Lucchesi demands attention; it includes five life-size female figures, and two similar-sized busts called "Life's Coronet" and "Innocence" respectively. A plaster model of Mr. Hamo Thornycroft's Oliver Cromwell, now established at Westminster, is accompanied by his portrait busts of Sir James Chance and Sir George Stokes, and by two imaginative bronze statuettes. Mr. A. M'Farlane Shannon's statue of Lord Kelvin has been lent by the Glasgow Philosophical Society, and is appropriately placed in the Exhibition on the river from which Sir William Thomson took his title. Altogether there are more than two hundred and fifty pieces in this hall, a fair number of which come from France.

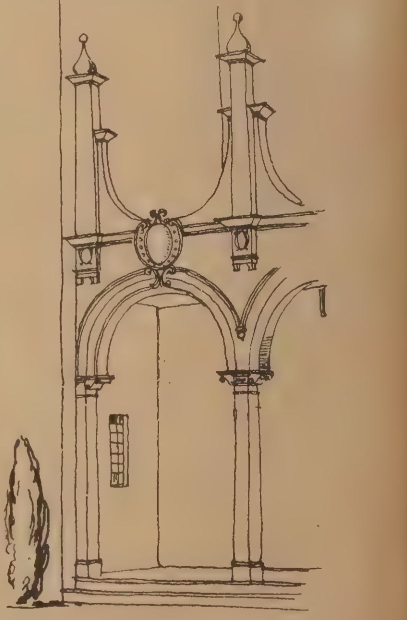
A little building known as "the Squireen's Cottage" represents Ireland. The house itself is charmingly situated on a slight elevation in front and to the left of the Concert Hall. It was designed by Mr. T. Manly Deane, and represents a small country house of Georgian period, at Malahide, standing on its own grounds. It is a low double-fronted house, with white concreted walls, rounded bay windows and thatched roof. The "friendly" aspect—to borrow a German term—of this modest structure makes it conspicuous. The interior is divided into several several rooms, which are devoted to different branches of Irish industry. A single exhibitor in Dublin has forwarded beautiful specimens of fourteen different kinds of Irish marbles, all polished, and there are some fine slabs and columns of Galway granite. The specimens of household furniture from Killarney deserve recognition.

Japan, France, Austria, Denmark, Morocco, Mexico, Persia and the United States are also represented, but no pavilion represents Germany, which is to be regretted.

In the two huge restaurants on the slopes of Gilmore Hill, clever and effective as they are in general mass and outline, the details are at once poor in conception and coarse to a degree. With this even the inexpert observer cannot but be struck if he compares them with the Van Houten building opposite. Designed by Mr. A. N. Prentice somewhat after the manner of an Old English manor-house, though very freely and characteristically treated in harmony with its function and manner of construction, it is especially notable for the refinement and care with which its details have been worked out, and is quite the best piece of architecture among the minor buildings. This little pavilion is cream coloured, with ornament picked out in gold.

The Indian Theatre, of which we give an illustration, is quite a small structure, and relies mostly for its delightful effect on the stencil work which adorns its front.

The arrangements for lighting the Exhibition merit a word. The system which has been adopted in the grounds was tried in Paris last year, and has since then been greatly improved. Mr. Buchanan has been in charge of this installation, and its effect is to make the outdoor part of the Exhibition better lighted than anything of the kind before. It consists of 140 columns, each carrying a shadowless lantern containing a three-light cluster of high-pressure Kern burners, consuming 31½ cubic feet of gas per hour, each cluster giving a light of over 1,000 candles. Twelve columns each carry three shadowless lanterns, with three-light clusters of Kern burners, and ten have five shadowless lanterns, each with three-light clusters. The total candle-power of the installation is 237,000. The gas is supplied by the Glasgow Corporation, who have laid special high-pressure mains for this purpose, and the work has been done by the Welsbach Company. The motor power is supplied by a water-motor plant (by Messrs. Keith, Blackman & Co., Ltd., of London) capable of compressing 6,000 cubic feet of gas per hour. The noise of the gas as it rushes into the burners makes the system unsuitable for indoors—at least in small interiors—but the cost is much less than that of electricity, and the light is more diffused. Electric arc lamps are, however, employed for the interior lighting of the buildings.


PORTION OF COLONNADE TO MACHINERY HALL.

Mr. James Miller, I.A., the architect of most of the Exhibition buildings, is thirty-nine years of age, and is a native of Perthshire. He served his apprenticeship with the well-known architect Mr. Andrew Heiton, of Perth. Having passed some years in Edinburgh, Mr. Miller in 1888 entered the service of the Caledonian Railway Company, where he remained till the end of 1892, immediately thereafter commencing business on his own account. The principal buildings erected from his designs are Belmont Church, Hillhead;

Prince's Pier Station, Greenock; and Gourock Station. Everybody in travelling by steamer must have been impressed with the admirable taste displayed in the designing of these fronts, while strangers are every summer heard to speak in the highest terms of the details connected with these conspicuous Clyde landmarks. Mr. Miller was also architect of the picturesque station at Botanic Gardens and Kelvinbridge Station, on the Glasgow Central Railway. Among other notable buildings he has designed may be mentioned the Glasgow Subway Station at St. Enoch Square, Kelvinbridge Mansions, Clydebank Municipal Buildings, Town Hall, and Public Baths, Library, &c., together with several churches and mansions in Glasgow and throughout the country. Mr. Miller has been recently appointed architect for the reconstruction of the Glasgow Royal Infirmary.

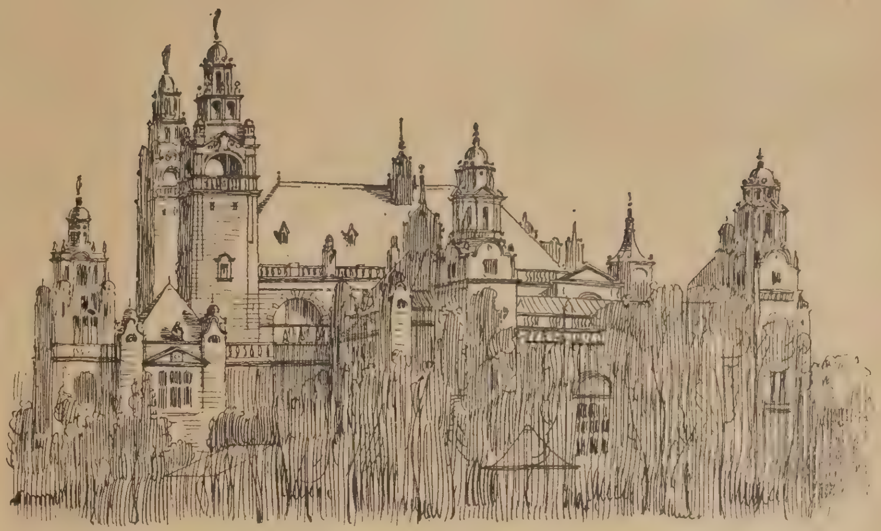
The contractors for the main Exhibition buildings have been Messrs. William Shaw & Son, of Commerce Street, Glasgow. As wrights and contractors, the firm has been long established. Mr. William Shaw died in 1872, when his son, Mr. Robert Barclay Shaw, succeeded him, then only nineteen years of age. The business was started as long as fifty years ago in Eglinton Street, and during the past quarter of a century Mr. Shaw has carried out numerous big works. His crowning achievements have no doubt been his erecting of the two International Glasgow Exhibitions, he having been responsible for the construction of the 1888 buildings as well as the present structures. It may be mentioned that in 1888 the main buildings, including the machinery annexe, measured 474,500 sq. ft., and covered about 10 acres. The 1901, including the Fine Art Galleries, cover an area of 20 acres. Mr. Shaw's firm used about 5,000,000 bricks and 750 tons of iron in the 1888 structure, also 700,000 cubic ft. of wood, 70 tons of nails and 250,000 sq. ft. of glass. Besides erecting the Industrial Hall, Machinery Hall and Grand Avenue, Mr. Shaw has this time also been entrusted with the building of two bridges over the Kelvin, the covered way at Bank Street, the Royal Bungalow, Bachelors' Café, Bodega, the bridge over Dumbarton Road, the agricultural section, the Concert Hall, water chute, two kiosks in front of the Art Gallery, and various tea rooms.

The engineer and electrician of the Exhibition is Mr. Thomas Young, M.I.M.E., M.I.E.E. He is one of the busiest men in the city of Glasgow.

Mr. Charles Carlton, sole member of the old-established firm of Charles Carlton & Son, St. Vincent Street, was entrusted with the painting and decorating of the Industrial Hall. Some time ago Mr. Carlton was successful in being appointed to carry out an important decorative scheme within the Municipal Buildings, and among the various large contracts secured by him of late was the painting at Woodilee Asylum. He is a Fellow of the Incorporated Institute of British Decorators.

Mr. Robert Whyte acted as master of works, his assistant being Mr. D. M'Intosh.

TOWER, MACHINERY SECTION.



THE FINE ART GALLERIES FROM BEYOND THE KELVIN.

REGISTERED ARCHITECTURE.*

By BULKELEY CRESWELL.

It is two years since I had the honour of addressing you in this room, and I feel somewhat apologetic when I remember that the subject I am bringing before you to-day might have been treated just as appropriately when I was here before. The proposal to register architects, like many other fatuous contentions, we have always with us, and the best that is to be hoped by those who are opposed to such a scheme is that it will remain in the state of being a proposal, and never actually be embodied in any rules regulating the practice of our profession. I am not aware of any reason why this subject should be dealt with at this particular date except a reason which is entirely personal, the reason being that a certain professional journal called attention to the subject, no doubt with the idea of enlivening its pages by resuscitating the slumbering polemics which this subject is notorious in provoking. I have been a good deal roused by what seems to me to be the extraordinary short-sightedness, and the lack of all those ambitions which one would expect of a profession which likes to call itself an art with a big A, apparently characterising those who lend the weight of their approval to the cause of registration. What I have first noticed as being essential in the regard of those who deal with this subject is that they look to the professional and material aspects of the subject, and seem to disregard altogether what to me is essential to the welfare and dignity not only of the practice of architecture but of any profession whatever. There is naturally a professional side to the question—the side which involves such questions as whether or not we shall be able with dignity and self-respect to make a living—and this, of course, must be considered; but it is certainly not the side which should be emphasised and made the essence of questions involving the welfare, discipline and conduct of the profession. My remarks must, therefore, fall under two heads, which may be described as the material, *i.e.*, the professional or trade, aspect of architecture, and with the ideal, that is, the personal, and I may say moral, aspect of the question; and in doing this I want to ask your toleration if I express myself with the emphasis I feel, and ask you to remember that I am not professing to be any wiser or more experienced than other people. I have frequently been called to task for expressing views which do not coincide with those of men of greater age than myself. I am weary of this; especially that I cannot make these men younger. This is not a matter of astonishment nor of regret to me in itself; because men whose minds grow old are at the stage of decay, and no man ever raised so paltry a retort unless he were desperately hard pressed for an answer. I am impatient of "Wait till you are as old as I am," for I take it that nearly everything that has been done in the world that has left its mark—that is making the world better—if it has not been done by young men, has been brought about by the persistency in men in remaining young. It is characteristic of youth, not of age, to make sacrifices and take risks. I take it that the essence of the "prudence" and wisdom of age is the absence of enterprise and courage, which has been reduced and disintegrated by the wearing and blunting process of living.

It is hard to have any reverence for that pennywise quality of wisdom such as we may imagine would conduct a provincial retail tradesman to a worthy old age and into which I, for my part, might beget a dread of lapsing if I were a largely equipped family man and the house full of measles. This sort of wisdom is entirely negative—it is a residuum, the waste of a life conformed to convention; it has no least affinity to the wisdom of Carlisle, Emerson, Ruskin; it has no fire, it is the dust and ashes of burnt-out convictions and ideals. We see these wise old fellows, with their knuckles on the table, at ponderous self-congratulatory functions emitting platitudes of expediency which a wholesome young man would be ashamed to utter. Call it "wisdom" if you will, yet it is not admirable but eternally lamentable. It examplifies that each has extinguished such fires as he ever had, and had pulled down his flag. There is, indeed, nothing reprehensible in this passive failure until it is made an ideal. I for one intensely resent that it should be accepted as an ideal, and I believe that we all here have that resentment.

I do not think that anything is more conspicuous of men of force of character, who have said things that the world is better for, or done things that future generations have loved to contemplate, than their perennial youth.

And there is another reason why on this occasion and in this place I have no objection to state my views with the emphasis with which I naturally feel inclined to endorse them, and this is the fact that the members of the Birmingham Architectural Association are supposed to belong to the younger branch of the profession, and I also am in the same rank, and I do not see why we should not discuss such subjects among ourselves, without the least suggestion of any reverence for or belief in the experience of other people. I have yet to learn that in any of the essential motives which direct mankind experience plays any very praiseworthy or indeed very considerable part. When I shall come to that part of my remarks which deal with the ideal aspect of registered architecture as I have named it, I shall have another apology to make, and that is to ask you to remember that you are not supposed to be listening to a sermon.

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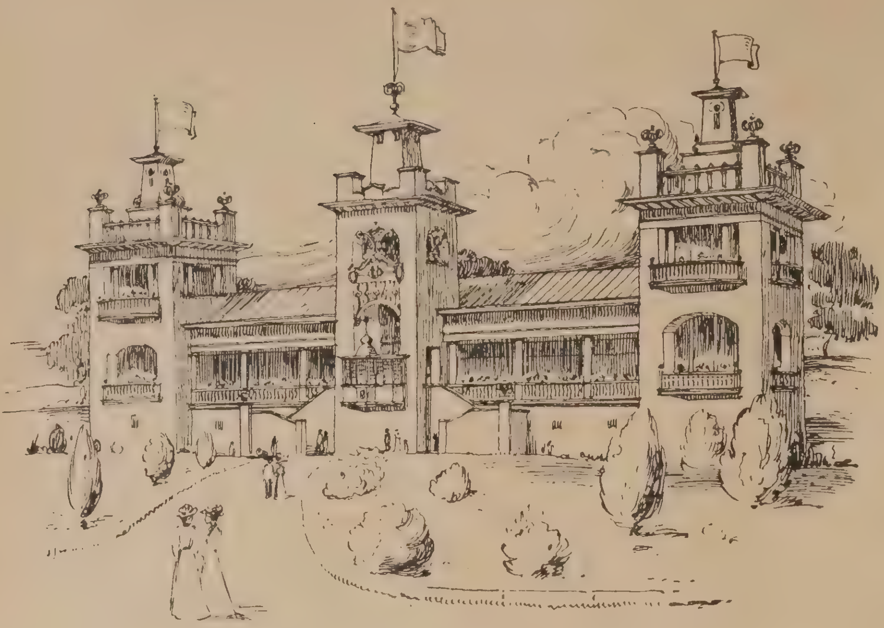
* An address delivered before the Birmingham Architectural Association on March 22nd, 1901.



THE PRINCE'S RESTAURANT, GLASGOW EXHIBITION.

I do not propose to spend much time in considering the Bills for proposed registration, but it has been a matter of surprise to me that there have been no less than five Bills brought in to the House of Commons in the ten years following the year 1888. These Bills are in essence identical, the last ones, however, being more concise. The history, scope and purpose of this Bill, for all in essence are one and the same Bill, may be summarised as follows: On April 6th, 1886, a meeting of architects was held in Freemason's Tavern, in London, attended by the members of the Institute, Society of Architects, and by practitioners not connected with any society, and a committee was then formed, called "The Architect's Registration Committee," to give effect to the following resolution then and there passed :—

> "That it is the opinion of this meeting that instructions be given to the Committee to consider the means necessary to obtain an Act of Parliament making it compulsory for all architects to hold a Government diploma."

This committee was composed of Institute members, members of the Society of Architects, and independent members, who set to work and eventually framed the Bill subsequently laid before Parliament.

The advantages claimed as arising from registration have been briefly stated to be as follows :—

Closing the doors to incompetent men.

Raising the standard of the profession.

Obtaining the confidence of the public and State recognition.

The provision of a general council and branch councils to administer the Act, composed of members of existing architectural bodies, as well as members nominated by the Privy Council and registered practitioners.

A provision as to the appointment of registrars, and the necessary machinery for registration.

The qualification for registration at the commencement of the Act, which includes all members of existing architectural bodies, and such other persons as could show, to the satisfaction of the council, that they were actually practising architecture ; and afterwards only such persons as have passed a qualifying examination.

The provision of an examination either by the general council or some already existing architectural body.

And, lastly, fines upon unqualified or unregistered persons practising as architects, and a provision as to their inability to recover charges for professional services rendered.

It has been further claimed that the first effect of a Registration Act would be to put a stop to any further increase in the number of incompetent practitioners, and thenceforth they would become a diminishing quantity.

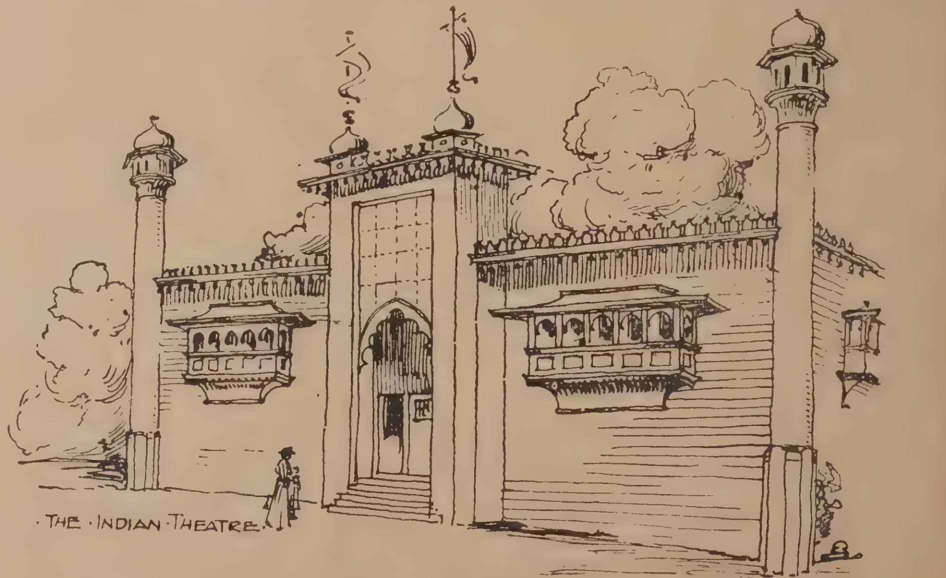
In the present it would mean that every man practising architecture should be duly enrolled in an official register under an Act of Parliament, and be duly responsible for his professional actions, and that no one be allowed to practice until he is duly enrolled.

In the future it means that no one be allowed to practise architecture until he is duly qualified, and has been found so by undergoing a qualifying examination.

The successive Bills prepared and brought in by various members of the House of Commons, among whom the names of General Goldsworthy and Mr. Atherley Jones are conspicuous, and among whom the name of Mr. Justin M'Carthy appears in connection with the Bill brought in 1889, are dated respectively 1888, 1889, 1890, 1895 and 1898.

After the first reading of the Bill in 1890, the Royal Institute of British Architects laid before the House of Commons a statement or petition against the second reading. The main objections put forward in this statement were that the Bill was not promoted by the Institute, which was the only body representative of the profession of architecture holding the authority of a royal charter ; that the Bill only provided against an unregistered person calling himself an architect, and, therefore, that a man calling himself a surveyor, engineer, builder, auctioneer, or, for the matter of that, pastrycook or chimney-sweep, would be free to practise architecture ; and the Institute further professed a healthy dread of their rivalry (which in the case of the pastrycook we may realise was wholesome and natural) ; that the fact of a man having been in practice for a certain number of years (the 1890 Bill fixed the period at five years, but it was reduced to two in the 1898 Bill) did not imply competency. The gist of the matter was that the Institute could not tolerate any such radical measure emanating from other invention than their own ; and that as the Bill enabled an incompetent architect to enjoy the privileges of registration, and would not preclude anyone from practising as an architect as long as he called himself by some other title, such as "builder designer" or "building agent," the result of the Bill would be chaotic, or, at any rate, that it would only contribute to the supposed anomaly it proposed to remove. These are all, no doubt, perfectly sound objections, but this statement of the representative body distinguished by a royal charter betrays demerits and disabilities in the profession which had been better kept underground. The point of demerit is that the profession avowedly has no objection to make to a scheme of registration which is not entirely based on considerations of personal benefit to the practitioner and the material welfare of the profession. Not a word or a sign appear which suggest that this representative body immaculated by its royal charter has any ambitions of architecture apart from the possibilities it holds out to the practitioner to grow fat in professional prosperity and achieving the dignity of a person of affairs. The admission of disability lies in the acknowledgment clearly implied and to be inferred that architects have entirely failed to impress the public with the good taste and merit of their designs and their general ability over and above that of the surveyor, builder or auctioneer who may put his services at the public's disposal in the rôle of architect.

I do not, however, propose to examine and criticise the clauses of the proposed Registration Bill. We may leave it with a parting glance at the possible picture it would provide of a well-qualified pastrycook, unregistered, hot in rivalry as a practitioner with an entirely incompetent, but registered, architect. I do not propose to take up the points of the Bill seriatim, because the principle is untenable to my thinking, and because, having in view the result, the restriction of freedom of thought and sincerity of expression, no Bill would be otherwise than disastrous to architecture considered as a profession only, to say nothing of the vast evil consequences it would have upon architecture in its highest sense as a fine art and as one of the most eloquent mediums for the expression and popular cultivation of taste and feeling that exists. As far as it is possible to decide, the object of the Society of Architects in so persistently urging the claims of this Bill seems to be based on some idea of adding cumulative



weight to the personal importance of members of the profession. This seems to be the general prevailing motive of those who are in favour of registration. The question they seem to ask themselves is, "Will registration lend itself to the impressiveness of my personalty with the public; will it increase the attitude of obligation in my client; will it augment the grudging 5 per cent.; will it raise me above my present social standing; and will it enable me to settle down—*i.e.*, to go impressively to church on Sundays with a silver-mounted umbrella, with wife and olive branches with enormous hymn-books, in full parade of their Sunday wardrobes, and to return home none the less impressively to a terrific smell of cooking at one o'clock? Will registration do these things for me?" One perceives that the answer has been in the affirmative. It is no use blinking the fact: rearrange and supplant the humdrum ideal as you will, this is the ideal of the five-per-center, and this the ideal which is one day to carry the tyrant Registration to the throne. The attraction which has made registration popular is no more than the attractiveness of a swag-bellied professional prosperity.

I do not say that the aspirations of all those who press the claims of registration are moved by any such ungenerous motives, nor that all those who have passed the examination of the Royal Institute of British Five-per——Architects, I mean—view the process as a means of hastening to the achievement of a rapid domesticity, but it would be ridiculous to deny that the great inducement to young men to enter for the examination is the qualification implied thereby in the public mind, and the act does not constitute an approval of the system, the real issues of which have no bearing on the decisions of the intending associates.

Then there is the public. It is constantly put forward on behalf of registration that it would secure for us the confidence of the public. I find it very hard to approach this contention with any patience. I cannot help detecting here also the special plea of the professional paunch and frock coat. Unless it is that we aspire to the dignity of the professional paunch and frock coat, of all confidences why aspire to the confidence of the public? I do not think that it is an exaggeration to say that in all matters involving the processes of the artist, or calling for the exercise of creative thought, the applause and approval of the public constitutes a very serious condemnation. The public praises and applauds what is specious and meretricious.

To him who assumes to be exponent of any art, or whose sphere is of creative thought, there can surely come no such unequivocal stamp of vulgarian and charlatan than this approbation in the eyes of the public. It may be stated as a general truth of all men of such calibre, that in so far as they have the confidence or approval of the public it is a proven token of shallowness of thought and vulgarity of method. That dark suspicion of speciousness which popularity throws is rarely at fault; its test is so searching that though the professed critic be unable to confirm the implication of public applause, the years will prove his error, and posterity know that their excellency is illusionary and ephemeral, and not of classic quality.

In architecture it is a fair and almost infallible proof of the true qualities of essential irremediable badness of a design that it shall provoke the applause of the public, and if a good design that it is regarded with popular coldness and distaste. This rule, of course, does not apply to traditional buildings, where quite other issues than those of architectural design direct the people's shout; but for modern buildings that aspire to architectural qualities this test is so far infallible that if we can gauge the attitude of the public towards a design we know with some exactness its comparative worth. Any cultured person may have personal tastes and prejudices which make him uncertain whether, for instance, the Houses of Parliament or New Scotland Yard is the better building; but with this test, he may decide at once that, whatever his own feelings may be, New Scotland Yard is much the best design because the public much prefers the Houses of Parliament and gave wild approbations to the design when the building was first put up. The attitude of architects should not be that of desiring the confidence or approbation of the public, but rather the reverse. The thinker and the man of artistic convictions, if he cannot altogether forget and ignore the existence of the public, will regard it always in the figure of a hulking mongrel cur gorging, with concentrated attentiveness, the offal in the gutter; and will remember, as was once pointed out by Mr. George Moore, that it is his duty and his privilege on all and every possible occasion to "kick the brute in the ribs."

I cannot conceive anything more humiliating to the ambitions and aims of a true artist or worker in any of the spheres of creative thought than to find himself the victim of the applause of the public—that is to say, to find himself the victim of the applause of the public by reason of his work; to know that his hard earnest efforts are so wanting in subtlety or original thought that they attract and amuse a thoughtless casual public. It is, of course, possible that a man may find a certain pleasure, and it is certain that many people *do* find a very great pleasure and satisfaction, in becoming a popular figure, a person of whom the public is ambitious to know what he has for breakfast and what he smokes.

This public concession to architects has been greatly lacking since Sir Gilbert Scott died, which speaks ill of our hold, of our endeavours, on the popular in this paragraphing age. But however sincere the flattery of public condescension may be it does not amount to any plea why the profession should shape its ends to this much mooted "confidence."

If we admit that in spite of all this the registration of efficiently qualified men is a thing which is desirable, the question then arises, How is this selection to be made? It cannot be arbitrary; it cannot be left to any body of persons to say that the ideals or acquirements of this or that architect entitle him to practise architecture, and that the attainments and abilities of another do not so entitle him. It is pretty clear that qualification, the process of eliminating the unsuitable or inefficient, can only be achieved by examination. Now what does this imply? What does it involve? It is obvious that no man can be tested by examination in that quality which the votaries of registration seem most anxious to secure and hold. The quality I refer to is the certitude of exacting full 5 per cent. from a grudging public. Even if it were possible so to examine men, the examination would obviously stultify its own end, for it would in effect select only those men who were best qualified to starve one another. The examination, if it were to exist to any real purpose at all, would have to make a test of the candidate's experience, culture and taste, and *of his ability to think.* I take it that these are the qualities upon which true proficiency in the practice of architecture is based. Unfortunately, the qualities which examination deals with are power of memory and knowledge of other people's experience—by which I mean the theoretical learning and knowledge acquired from text-books. I think we must all be agreed that there is much to be desired and much to be amended in the educational schemes in vogue in this country. The whole tendency of modern education is to cultivate the memory, and the memory is cultivated at the expense of the power to think. There is this strong uniform influence in every course of examination—that they tend to shape all minds to the same conventions of thought and the same intellectual methods. This is an influence in diagonal antithesis to those which promote creative thought and inspire imagination; and it is an influence which, more than any other, must devitalise the poor,

CANADIAN PAVILION.

fragile, twitching carcase of architectural enthusiasm in this country. An examination to qualify architects would reduce to an absurdity the established theory of education in this country—itself an absurdity. If we consider it, a magnified parrot would do not discreditably at an English public school and stand a chance of, perhaps, taking a prize or two back with him to his cage at the end of terms; and as his repertory increased he would make good marks in most of the public and professional examinations. By what process we have come to regard a capacity for retaining facts as a physical desideratum, or an admirable acquirement, it is difficult to conceive. Of our own experience we may all recognise how opposed is the habit of retentiveness of data to fertility of mind and a ready imagination. The faculty to command data is of little use or purpose. Every man remembers the facts involved of the routine of his daily work, and to hold a multitude of facts which are not within his usual need is to usurp some of the finer processes of thought. True power lies in the use of those essential facts; and a man who has a good handbook in his pocket and knows how to use it is vastly better equipped than another who has the data it contains in his mind, granted that their mental ability and vigour was in the first instance of the same calibre. Even if the test of memory, which is the test chiefly comprised in examination, were a sound and truly discriminating test in such positive subjects as law and medicine, it would still remain utterly fatuous to apply it in the case of architecture. The exercise of memory of data and the habit of committing to mind exact facts constitute a mental attitude the most hopelessly removed from that by which architecture is to be purified or dignified. In every building each moulding drawn and each nail driven for the reason, and by the mere knowledge, that it has been so done before is a contribution to the sarcophagus of architecture.

It is the power to think and feel only which constitute the intellectual qualities by which a man becomes an individuality and leaves the world in any case better or wiser than he found it. Any fool can remember things. We may say that thought and memory are in antithesis. A man who acquires the habit of memory loses the ability to think. We most of us have cause to regret the processes of our education, I think. My own education, as I remember, consisted in being required to remember facts and data, and I recollect that the sense of feeling was always supposed to be the chief of the receptive faculties. I may say, without exaggeration, that I took the bulk of my education through the skin, and it is a great satisfaction to me at this time to know that, in spite of all, I conquered in the end, and that I never learned to remember anything except by accident or when taking it unawares. I think there was hardly an exception to this, but I still retain a few items of historical data which burden my mind still, owing to the fact, perhaps, that it was instilled—that is the word, *instilled*—by jabbing me over the head with the book itself. There is something logical involved in this system, by which you will observe that the contents of the book are brought into direct connection with the brain-pan itself. It is thus that I never have been able to forget the date of the Battle of Hastings, 1066. It drew blood!

DETAIL ON TOWERS AT MAIN ENTRANCE.

But even if we choose to think that it is not unsuitable that the education of boys should consist primarily in forming in them the habit of remembering—and in view of the character and of the manner in which public examinations are now conducted, this form of education has, indeed, some excuse made for it—we must recognise that, when applied to the professional education of young men who anticipate practising as architects, the utterly disastrous results of directing the studies of these young men in such a way that they aspire to become proficient in the ideals of every age and country except their own, and to lay up in mind the tabulated experiences of other people rather than to grasp the ideals and needs of the present day, and to habituate themselves to cultivate their own ingenuity, observation and invention, cannot be exaggerated. I shall have more to say upon this subject shortly, but I wish now to deal a little more clearly with the examination. It has been brought forward by the votaries of registration that the proposed Bill means little more than the enforcement by compulsion of all who would call themselves architects to pass the examinations held by the Royal Institute of British Architects. I confess, generally, that I am not very much in sympathy with the Royal Institute. I hope any of you will take the opportunity of putting me right if I am in error; but I feel always that the Institute is not unjustly represented by the nickname of "Royal Institute of Five-per-centers." I do not say that the Institute is deserving of this twit in any exact or positive line of action it has adopted, but rather from what seems to me its lamentable neglect of what should be, to my thinking, the most pronounced and most salient characteristic of a body which esteems itself as representing under royal charter the interests of architecture in England. I think the Institute is associated much too closely with what I have already called "the paunch and frock coat of the profession," and that it has not identified itself with any subject whatever which has in view the furtherance of the vital and essential elements which make architecture a living national art rather than an opportunity for gentlemen to make handsome incomes with dignity and high repute of their fellow citizens. Upon whatever occasions, and in whatever circumstances, one approaches the Institute, one expects to find that the prevailing tone and the essential tendency of its actions are in the interests of five-per-centism or archæology; and one is never mistaken. I think that this quality of the Institute is exemplified by their system of examination. At the best the examination assumes to turn out young men decently educated, who are not likely to do anything which cannot be substantiated from a text-book, and are not likely to design anything the form of which cannot be traced in the traditional architecture of some country or other at some date of its history, and, in general, young men who are immensely gratified by realising that they are equipped fully to obtain a client and tear a five per cent. out of him. I am anxious not to be unfair, but I think this is no inexact description of the average output of the Institute.

THE MAIN DOME IN PROCESS OF CONSTRUCTION.

It is hardly necessary to point out that the examinations are entirely elementary in principle. It is true that it may not be possible to pass the examinations without trouble and time, but the character of the examinations is none the less elementary, though often in recondite and abstruse subjects. The processes of these examinations may be described as architecture by rote. The immediate product, taken as a whole, will be healthy young five-per-centers, who have subjugated the legitimate functions of their brains for a time, and have assumed formulæ, tables of facts, strings of dates, graduated weights of lead pipes, &c., and stores of similar useless fatuous things. They have acquired images and data of traditional forms of architecture all analysed and tabulated in readiness to be produced, drawn and articulated with the precision of Mr. Maskelyne's mechanical drawing girl, and the whole of which it is their salvation only to forget as soon as possible. Although it does not mitigate the fatuity of these examinations as an institution for qualifying architects, it is due to those who regulate them to say that it is difficult at all to conceive how they can be made other than elementary and impracticable. If it be considered, the various phases of architectural practice and its field of experience are so wide and varied, and the whole of so essentially a practical character, that it is clearly only possible to examine an incompetent man. The fact of a man's capabilities as an architect having been really and fully assessed in examination may be considered conclusive of his incompetency, for if a man has had the responsibility of conducting a certain class of architectural work, there is no one who can assume to examine him. In the field of his own experience the examinee can stultify his examiner, for no text-book can confute him; his examiner's field of experience is limited; and even if his examiner's field of experience should tally precisely with his own, and his conclusions yet be in antitheses, he cannot be convicted of error. It must stand merely as a difference of opinion.

There is no answer to his "I have done it" even were the text-books not notoriously at variance on subjects which would seem to be ascertainable facts. An admission of this portentous anomaly in the examination is made in the nervous distrust of the examining authorities, who arrange for a personal interview with the applicant before daring to "pluck" him. The examinee has written things in his papers which the examiners never heard of or which seem wrong—but it cannot be decided whether ignorance is on the side of the examiner or applicant until it is seen how the latter comports himself when challenged. In other words, the examiners (from the nature of the subject) cannot answer the questions they set except in an elementary manner, and it seems likely that a really admirable brazen liar could not be "plucked" by power of man. Here one finds a new lurking significance in the letters A.R.I.B.A. The examination as it now stands is easy and bland to the student, who, having induced atrophy of his thinking powers, has by the process of cramming acquired extracted handbook essences, and who generally knows his subjects as a child who sings in class "N'thumberlandnewcastle-on-th'tine" knows geography, but is harsh to the man who has knowledge and experience. The former, for instance, will give the recipe for putty by the reel, and repeat accurately in the words of his authority all "Rivington's" entirely inaccurate statements anent, for instance, the slaking of ground stone lime, although he may never have seen either, and he duly gains credit; while the latter, treating the matters insignificantly and from practical knowledge of them, will win to associateship, if at all, by cowing the examiner in personal interview.

Only the other day I was speaking of this matter with a friend of mine who does not altogether agree with the views I have just put forward; this may be partly explained by the fact that he is an "Ashpitel" prizeman. He admitted, however, that though it is many years since he won his success, and although he has since had wide and varied practice, he did not think he could without preparation pass the examination now, though he said he believed

THE BUNGALOW RESTAURANT, GLASGOW EXHIBITION.

that with a month's study he could do all and probably more than he had previously achieved in the way of earning marks. If we are to accept this as a statement of this gentleman's indebtedness to the examination—and I think it is probably a quite just and exact statement—it shows pretty clearly that the knowledge acquired in preparation for this examination is not the kind of knowledge which is applicable to a man in his practical work, or information of a kind which practical experience adds to or strengthens. Apart from this, as I have already pointed out, we have to take into consideration the highly derogatory influences which the process of storing data, facts and information generally in the mind has upon the processes of thought, power of imagination and selection, and upon that ingenuity and activity of resource which always mark and distinguish the capabilities of an architect.

I think that any general investigation of the condition of architecture in this country shows us clearly that it is our attitude towards tradition which more than anything else is stifling the impulses which tend to place architecture in the position of a great national art. We are hag-ridden by the traditions of past architectures. We find it very difficult to conceive a design except as represented in one or other traditional style, or, let me say, except as represented in the forms directly derived and exemplified in traditional styles of architecture. In Mr. W. Emerson's inaugural address as president of the Institute—and I refer to it as being the address of the president of the society which is taken to represent the best impulses of architectural practice—there is a passage in which he laments and bewails that undoubtedly the arcade gives the architect his only chance of making shop fronts constructively reasonable, and that at present huge facades of stone or terra-cotta and brick appear to be slung in air over a yawning abyss of plate glass. He adds that, of course, everyone knows that they rest on iron girders and columns, but a well-designed arcade would give a sense of safety and constructive propriety. I only call attention to this remark because it is on a par with many similar opinions which are frequently expressed. What is the grievance? Apparently Mr. Emerson, and people who think as he does, resent the necessities which compel architects to raise buildings over big shop windows in which there is plate glass; that is to say, that these gentlemen protest against and regret the insuperable difficulties of the adaptation of traditional styles under the conditions in which they have to work; to fill it in more fully, I take it that their objection is, "How on earth am I to take a stone lintel across an opening of 15ft., when I find that there has been no tradition of architecture in the history of the world which has ever in any degree provided forms or devices by which a span such as this one can be covered under the conditions which the needs of this case enforce?"

Well, we will grant that this is an exact statement. We will grant that architects, as needs have arisen, have stretched out their arches until they have become lintels, and pulled out their lintels, like sealing wax, until they were nothing; and we can appreciate that men of Mr. Emerson's nice discrimination and æsthetic sensitiveness would revolt from such outrages upon arches and lintel. Then, what is to be done? Apparently architecture as it would be rendered by architects of the greatest prominence and acquirements must cease; or else the public must leave off desiring shop windows with plate glass on the ground floor of lofty buildings.

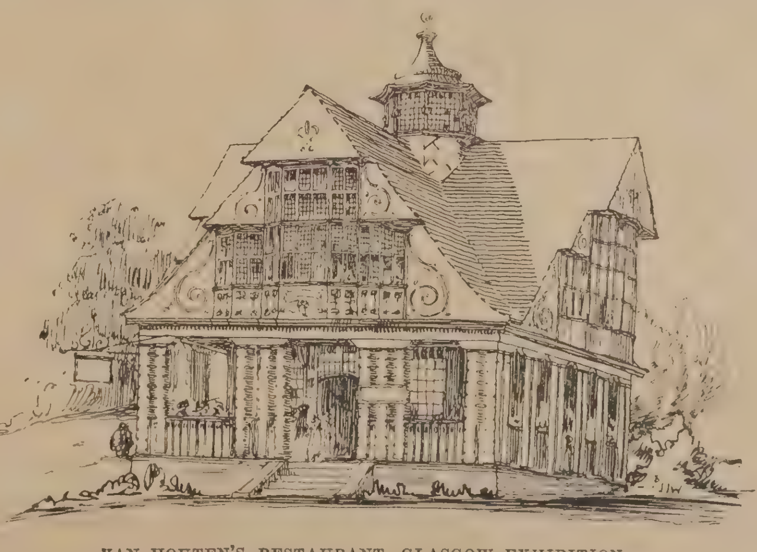
As far as I can make out, the matter is generally accepted as resolving itself into these two questions. As the second alternative is out of the question, we go on as we have been going on testing the elastic possibilities of arches and lintels, and training our eye and our mind until it discovers nothing unfitting in terra-cotta columns of a diameter which would be totally insufficient even if the material were the hardest granite and the other forms described by Mr. Emerson, and we generally shrug our shoulders and consider that we are making the best of a bad business.

Now, gentlemen, I wish to put it to you whether, so far from these unusual conditions and requirements with which our clients saddle us tending to restrict, deform and stultify the usages of architecture, they do not rather open up possibilities and give us opportunities which perhaps at no other epoch in the history of the world have before arisen. I ask you to consider what was the predicament of the early Doric builders when they first essayed to build with stone from the quarry, or what that of the Greek architects who sought to raise their traditional styles in Rome, where the materials of their craft were largely wanting; or what that of the early Romanesque builders in France and elsewhere who had to devise structures of freestone which theretofore had been rendered in large and hard stones of deep red. All three of these peoples at these three different epochs have formed a landmark in the history of architecture, and raised a monument to human ingenuity and truth of emotion which while the world lasts will be regarded as among its greatest wonders. So, again, may we not recall that almost greater wonder, the evolution of the Renaissance styles, which were not the result of any necessity whatever, but arose from some subtle mental reaction against forms and traditions grown too familiar.

I put it to you, gentlemen, that the predicament in which the Greeks and the Romans and the Normans found themselves, and which they faced with such triumphant results, were every whit as insuperable as those which Mr. Emerson calls attention to in his address. I think I may say that each of these peoples answered the questions put to them not by straining their traditions to fit the needs but by continually admitting these needs and eulogising them. There is no doubt that some such process creative of changes and modifications which took place at each of the periods which I have alluded to is now taking place with us; but we of the nineteenth century, who like to call ourselves the heirs of the ages, have the privilege of other people's experience and the wide view of past history, accessible to us and familiar to us all, to guide us and stimulate us in the right direction, and assure us that the direction which we take and the views we are adopting are those which will lead us to some such triumph as has waited upon our predecessors in the centuries past.

Instead, then, of regretting the need for structural ironwork, and attempting to hide and disguise it, we must not only avow it, but seek to emphasise it and decorate it. If we think that a rolled steel joist is an ugly thing in itself, that must be entirely and solely a matter of prejudice, because the quality of steel and of iron is a thing which is extremely beautiful, and, as compared with other materials, unique and wonderful. It is true that when we use a rolled steel joist where we would expect a stone lintel, it is offensive to us because our eye, or rather our mind, is prejudiced by being long accustomed to see its place occupied by a material which we have learned to admire and eulogise as possessing quite other qualities.

I think myself that a great deal might be done in the candid use of cast-iron beams, which from their nature and texture partake more exactly of the quality of the true lintel as we have learnt to regard it than does a rolled steel joist or a built-up girder. It is obvious, however, that if such material is to be incorporated in the design of a building, there must not be in the design of that building features which long habitude of convention and taste and prejudices have associated with arches or with stone lintels. But I do not wish to take exact instances or to analyse the practical application of the theory which I am trying to express—it is a very interesting speculation, but this is not the place for it. What I wish to insist upon is that if we are to be "live architects," to borrow an Americanism, we must place ourselves in close sympathy with the ideals and the needs of our own day.



VAN HOUTEN'S RESTAURANT, GLASGOW EXHIBITION.

There are many aspects of the practice of architecture which should make our own particular epoch particularly sanguine to the anticipation of architects, but, on the other hand, we have as a body serious limitations and very grave deficiencies in our attitude towards our art and our attitude towards the time. I think, perhaps, the most salient of these is the lack of robustness in our view of things, and our attitude towards life; and a certain æsthetic self-indulgence—shall I say?—in our architectural habit. There is, as we are all conscious and as we all experience, a very deep attractiveness in the romance that attaches to what is old and to what is associated with the life of our ancestors or the past history of the nation. It is a sentiment which simple people of essentially philistine and average intelligence can understand and appreciate. It is a sentiment which stimulates the imagination, and it is very easy to achieve—shall I say?—the poetic afflatus when the mind is environed with these associations. But this, I feel very strongly and wish to insist with a good deal of emphasis, is not the attitude towards art or architecture or poetry which ever does or ever will constitute an epoch which posterity will look back upon as forming a landmark or producing a school of thought or artistic achievement. The schools of art that have found a place in history have been schools that were intimately in touch with the life of their day and the aspirations of their surroundings. The men whose work has lived and has been proved to be intrinsically sound, true and good have always been the men who were an integral part of the system and surroundings in which they lived. I do not think I need insist further upon this point; it may be amplified and enlarged upon almost without limit. We do not really try hard enough; we have no right to rest on our oars and enjoy the dreamy images created in the romantic atmosphere which frames the past. If any architecture worthy the name is to be built at all, it will be an architecture that expresses the needs, ideals and conditions in which we live. Nothing will be achieved by the work of any cult. We may all of us see this in the vapid folly and crudeness and unreality of the work of the revivalists. There is a great deal in which the impulses of the revivalists are still seen. We note the inability of the nation—of architects—to express even its religion. We are beginning to try to do so a little, but until lately no one seems to have tried to build a church except such a one as expressed the mystic surroundings of centuries passed, when devotees with red-hot pincers tore the toe-nails out of other devotees who happened to be fewer in number or who had not their pincers with them. I think, however, that the baldness of thought and feeling that mark church architecture is more due to the prejudices which attach to the modern devotee than to the fault of architects. People think that there is no more reason why the form and the sentiment expressed in the forms of the architecture of their churches should be changed than that the prayer book should be reprinted. The curious thing is—though, indeed, I think it is only what would be expected—that the class of architecture which will be regarded by posterity as having the most sincere distinctive mark, the essentially characteristic mark as attaching to this epoch in architectural history, is by us almost disregarded and by the majority of us, I believe, tabooed as being unworthy of the highest traditions of the architect—I allude to public-houses and restaurants. I see in these, as put up in our large provincial towns and in London, a style of architecture which is generally distinct from anything traditional, which perfectly expresses the sentiments and the needs of its existence (which I take to be to satisfy the æsthetic want of a muzzy or drunken man); and I take it that this style has been evolved, and a tradition has gradually grown and attached itself to the idea of what a public-house should be, without any thought being expended on the subject except such as would enable an architect to satisfy his client; and that such architectural education or culture as belongs to the profession of architecture has had no bearing or very little bearing upon the motive, nor has it regulated the forms and decorations which mark these buildings. If we realise this, we may regret that some serious attention has not been given to this class of building. The growth of restaurants and hotels during the last ten years, chiefly in London, has been phenomenal, yet I may say that the profession of architecture has had little or no voice, and has not exerted itself or achieved any substantial uplifting or chastening of the crude wants of an inebriated public. For my own part I think that the direction which offers the best opportunities to the architects who are going to raise the characteristic twentieth-century architecture, which I insist will be in many ways a revolution of previous principles, is that afforded by such things as pumping stations, waterworks, electric-lighting stations, gasworks, and so forth.

I think the man who had the opportunity of designing or building soap works or a bone-manure factory would have such an opportunity as few architects in the world's history have surpassed. We still have prejudices that such things as soap-works, waterworks, gasworks are not things that it is possible to express or idealise in architecture; but to that I, for one, am in very strong opposition.

These factories and works are the centres of human history, and are the hub round which the life of the people and the life of the nation is centred. If the life surrounding these places is squalid, unhealthy and destitute of the wholesome recreation and relaxation which alone makes life a graceful or worthy thing, this is not due in itself to the nature of the employment, nor perhaps rather to the fact that these industries are all of so recent a date that the race is not yet accustomed to the new conditions in which it finds itself. It is the prerogative of architects to invent forms which shall eulogise such needs and employments of the race.

I think that most of us, though we could rise to the possibilities offered in the opportunity of designing a cloister, and would have no difficulty in calling up that essential element of enthusiasm and imaginative activity from which alone an appropriate design can emanate; and though we should have no difficulty in acquitting ourselves to our satisfaction in the matter of this thing, which has been for some 200 years dissociated with life in England, and which is suggestive of nothing more than what we hold to be the gloomy horrors of ignorance—we should few of us succeed, even if we had the intrepidity to try, in adequately or even in any degree expressing the idealisation of soap works in the architecture of the building.

In giving this particular instance there is perhaps the danger of reducing my contention to absurdity, but I am perfectly sincere and earnest in what I say, and if you will admit that the true mission of architecture is rather to idealise and eulogise such wholesome and dignified institutions of our age as pumping stations or electric-light stations, you will see, I think, that it ought to be ambitious of the power to make even soap-works or bone-manure factories, whose existence is coincident with the nation's prosperity, and to which a large part of the population have to look for their means of sustenance, actively expressive of the undoubted dignity of their purpose.

As I have already said, I cannot, and do not, believe that the great epochs of architecture were created by men who worked in the atmosphere of retrospection in which we work, or who drew the enthusiasm which inspired their work from the romance which attaches to the associations of the past.

We are always tasting our own dishes; we are always congratulating ourselves; we all are tremendously conscious—know we are Artists with a big A. This I firmly believe to be annihilation to all effective work; and by effective I mean sterling work. This notorious quality which belongs to us among the spheres of activity at this present day has drawn from Mr. H. Wilson the witty saying that there can be no art where there are artists.

I take it that the Dutch, when they decorated and shaped their milking cans and dairy and kitchen utensils, did so from a feeling of instinctive dignity and fitness which they desired to see expressed in their surroundings rather than from any self-congratulatory idea that they were artists, or with any idea that these things were fit to be set about and looked upon solely for the intrinsic beauty of their outline and decoration. I think the lack of robustness in our ideals, and lack of aptitude to cope with the exigencies and demands of the times in which we live, is in itself, if it were not counteracted by other aspects, a distinctly decadent impulse, such as would mark a decaying and decadent race. It is quite fair to say of the ruck of our profession that they are standing on each other's feet. They do not move to fresh enterprises of their own, but hang each on to the lapel of his fellow's coat—that Jones did so-and-so is a good reason for Brown to do likewise. The illustrations in the professional journals are a bugbear. I have myself worked in an office where some forty or 400—I forget which—volumes of the "Building News" formed what I may describe as the working capital of the office. It is terrible to think of the number of buildings which owe their genesis to the litter of perspective views which fall on our heads once a week from the regions of Fleet Street and Covent Garden. Is any prospect more truly hopeless to the existence of architecture at all than that such a custom should obtain among us? There is a metaphor which is applied to men who exist by reproducing themselves, namely, that they live by sucking their own paws; but I think that we architects are deserving of a more unsavoury comparison, for the bulk of us may be said to exist not indeed by sucking our paws, but by sucking each other's paws.

Gentlemen, I think that so long as we are content to shelve the responsibility which undoubtedly attaches to our profession in this matter, that all hope of resuscitating the true spirit of architecture is at an end, and I think that nothing is more hopeful or more suspicious to contemplate than these insuperable difficulties of plate glass and shop windows which the President of the Institute of British Architects laments; and I think that nothing holds forward a better hope of the foundation of a new and a true architectural epoch in this present century than the opportunity which may be offered to architects to supply new needs with new materials, whose æsthetic possibilities hitherto throughout the history of the world no architect has ever had to deal with. I have dwelt so long upon this part of my subject, because it seems to me that the examinations of the Institute of British Architects—and I think any other examination as distinct from a course of study which it is easy to imagine—would effect that all would-be architects in the years of their studentships would be qualifying and training themselves in precisely this same habit of thought and method of work which I have been depreciating. The present conventions would be formulated by State interference. Registered architects implies registered architecture of this hopeless order. I do not think that any examination can be so designed and carried out as not to have essentially the same faults, and not to lead to essentially the same bad results as those which are undoubtedly effected by the examinations of the British Institute.

It is not merely that the conditions of the examinations—if, indeed, they do not entirely preclude the mental processes of design—require an examinee to draw something he remembers, and give preference to a design in which tradition forms appear, but that the whole tendency of the examination is to direct prejudices of architects into those proven paths of wrongness which were idealised early in this century. We, the new blood, the vital element of architectural progress, have long satisfied ourselves of the essential ignorance involved in the motives which directed the enthusiasm of the revivalists. They thought that by attempting to repeat an inimitable thing they were perpetuating the beautiful. These repetitions, irremediably ugly and stupid, writ over with a conscious vain effort of design, smelling of india-rubber, of 5 per cent., of the contract system, of provincial p.c. amounts for carving—these imitations, spread about over the country, have almost made the inimitable incentives to the craze repulsive to us. Is it not within our common experience to enter one of these inimitable mediæval buildings and gaze upon it in mental weariness? On all sides its parts recall parallel or divers treatments, and provoke comparisons among hosts of modern buildings cheap, uncandid, of repugnant associations, spring visited by the Architectural Association, or published in the ruck of published perspective views. By them our critical faculties are become jaded and enervated, our taste by constant analysis debauched, we are *blasé* and insensible. Ours has been the loss of the man who makes scented cotton roses for a living, when he goes into the summer garden; and we have deserved it. If we all wear sham jewellery the essential beauty of true gems will soon be placed beyond our powers of appreciation; and it is further true that admiration of the kind that, on its own initative, sets about to make an imitation of the thing admired is of a gross calibre and points to the savage's insensibility of perceptions. What do we read in the destiny of a nation which is at once so oblivious to the mystery, pathos and almost sanctity attaching to the examples of the conventions of art of past ages as to desire to associate them with their drinking and money-getting, and at the same time has not the vitality to idealise its own life and aspirations? We have frank indications that this order is passing, and that it is to be changed by this generation. The principle of eclecticism has long been established, and is now ideal with us which tends to the error of being transcendental. The modern building which we now hold distinguished is that which holds no reflections in its elevation, and returns no echoes. In their susceptible days our fathers only considered a building to pass muster when it showed a polite and scholarly relationship to precise traditions in its parts and proportions. And it is our fathers who now sit in power at 9, Conduit Street, and frame proposals for registration. Is not this how it comes about that the Royal Institute of British—I was going to say Four-per-centers—Architects, &c., &c., in its scheme of examination enforces a principle of education which is opposed to the redeeming spirit of eclecticism. Thus it requires: "Give the dates of ——," &c., &c., &c.; "draw to half-inch scale an example of ——," &c., &c., &c.; "state the proportions of ——," &c., &c., &c.

I now come to what may be called the somewhat transcendent aspect of my subject. It has been urged by those who advocate the Institute examination that the examination offers a young man an opportunity of obtaining employment which will be an advantage to him when he first takes his place in the practice of the profession of architecture, but I do not think it is necessary to make any remark in retort upon such a contention. It is undoubtedly true, but is of course entirely beside the mark. If the examination is to be employed at all, it must be on the ground that it benefits the profession of architecture or that it magnifies the status of architecture.

It has been, however, urged that there is no sort of reason why a man should not avail himself of all possible advantages, and that, after all, if a man should choose the course of educating himself on the lines indicated by the examination, and so qualify himself, he only acts in accordance with sound common-sense. No doubt, people who put forward such a contention as that think they have made a strong point. I can only say, for my part, that I think it entirely discredits the examination, and entirely discredits the motives and ambitions of those who upon such grounds advance the claims of examination and of registration; for, gentlemen, what is common-sense?

I think, if we consider it, we shall realise that the quality of common-sense when we get beyond the sphere of activity of the small retail tradesman, let us say—that the quality of common-sense is one which is almost entirely absent from among the characteristics of men who have done things that the world was glad to remember and think of after they were gone. If we imagine Isaac Newton a man of "sound common sense," we must imagine him eating the apple when it fell. Who, gentlemen, but a man devoid of all common-sense when the kettle was boiling would ponder upon the reasons of its boiling instead of enjoying himself, shaving himself and moving upon his business? Yet it was by such a man that the world was introduced to the potentiality of steam. I may mention to you the name of a man to whom all of us, whatever our views and however we may regard the views of this great man, yet owe a great deal, who had no suggestion or taint whatever of common-sense—I refer to John Ruskin. The very essence of common-sense is the prudence and foresight that avoids risk, the foresight that enables a thing to be done as easily and as profitably as may be. On the other hand, the very essence of all original effort and of all art worthy the name, and, indeed, of all real work, is to make sacrifices and to take risks. I find it very hard to recall an instance of any man whose work we remember with gratitude as having helped us and taught us whose life is not very largely a continual example of sacrifice great or small; and what is the history of the individual is the history of the cult or school to which he belongs. I think it is this very element of sacrifice, of giving without return, without speculation for return which really does constitute what is great, inspiring and ennobling in all art. The work that is done for money or that is done the easy way, though we may not recognise it at the time when our view is distorted by convention and the reactions of fashion in which we live, will to posterity always bear the clear mark and indication of having been done for money or having been done easily and without pains. It is this element, I take it, that Ruskin continually insists upon in his writings under the somewhat unfortunate term of "worship."

I think we can hardly turn to a conspicuous name in creative thought or in the domain of art but we find just this same self-immolation. I recall that Romney sent his wife away from him because he found that her proximity interfered with his ability to clearly conceive and render his pictures. Those of us who have read the Vailima Letters may recall the extraordinary self-denials which Stevenson enforced upon himself in order that his work might be rendered at that high nervous pitch and tension which, indeed, eventually killed him.

There is the same instance in the splendid devotion of another writer, Mr. George Meredith, who has stuck to his own ideals and persistently and unwaveringly held to his own convictions in the face of years of misunderstanding and misinterpretation and the abuse of critics. It may not be generally known among you, gentlemen, "Richard Feverel" was published in the same year as "Adam Bede."

I do not think it is in the least necessary to amplify this point. The thing which never vanishes in the work of a man or the work of a school, cult or profession is the motive of it. If work is to be done for 5 per cent. or if it is going to be done in order to attract clients, the building will bear written on its face for ever: "This was done for 5 per cent.; this was done to please the crowd."

At the same time, as I have already said, it cannot for one moment be said that a man is not perfectly justified in declining to make these sacrifices, and in electing to live a life of more complacency and one less nervously enervating. But even then his motives should be the highest motives if he is to take his place in the rendering of such subtle and complex matters as the architect is called upon to contemplate; and though we have small chance of giving expression to our highest enthusiasm, or of seeing our most disinterested ambitions realised, it is the very essence and life of the practice of architecture that such ambitions and ideals should exist and be recognised, and where should such ambitions and enthusiasms exists if they are not to be found among young men, if they are not to be inculcated among those who are preparing themselves to take a part in the profession? And how hopeless must any project of architectural improvement appear if a system is adopted which involves conditions of education, which, I think, without any unfairness or any exaggeration, may be said to depreciate enterprice and high ambition, which tends to depreciate all instinct for abstract reflection, or, indeed, of thought or reflectiveness of any kind, and which is clearly formulated in the interests of the profession and five-per-centism rather than in the interests of the advancement of architecture from its present submerged state to a national living art. And of those gentlemen who are willing to make sacrifices in the cause of their ideals and to deny themselves the luxury of a professional paunch, and to whom the architecture they are responsible for is the best and highest good, what is their reward?

I have nothing better to say to this than to ask you to read the little parable by John Ruskin (in his "Queen of the Air"). It has been christened "The Fly and the Watch Dog."

Correspondence.

Examination Questions in Building Construction.

To the Editor of THE BUILDERS' JOURNAL.

GLOUCESTER.

SIR,—Most persons are, at last, becoming aware of the fact that examinations are not fair tests of knowledge, and I quite agree with the remarks made by "A Student" on p. 309 of your last issue. Personally, I am quite disgusted with the building examinations. Anyone who knows a little about building construction, if he takes the trouble to examine the papers for the last five years, will notice that the questions are annually becoming more difficult and less easy to understand. I think that this subject is very badly taught in schools. For instance, I have more than once known a student set to "do a door," and he puts plan, elevation and section in almost any position upon his paper, not having the least idea that there is any connection between the three; and this after two or three months' teaching! The more students that are pushed through the examination the better for the school, and the Government grant.—Yours truly,

ANOTHER STUDENT.

To the Editor of THE BUILDERS' JOURNAL.

SIR —I must emphatically endorse the remarks of "Student" in your last issue with reference to the questions in the recent examination of the Science and Art Department in building construction.

For instance, in the Honours examination, Division III., a figured diagram is given of a shop front with the height from floor to floor figured as 12in. It may be intended as 12ft., but how is the candidate to know this is not a catch question intended to test his powers of observation. Two answers depended on this diagram.

In the same examination, Division II. (dealing with strength of materials), there are only three questions, and a failure to answer one of them correctly is fatal to the candidate's success. All reference to tables, &c., is strictly forbidden, yet the first question, which relates to the strength and stability of a factory chimney, cannot be answered without reference to a table which gives the value of a hollow rectangle. Rivington, Part IV., works out an example of the stability of a chimney, but refers the student to a table (Appendix XIX.) at the end of the volume for the value of a hollow rectangle. Then, again, this question relates to a factory chimney, whereas the syllabus distinctly states "in ordinary walls . . . he must be able to ascertain the conditions necessary to stability, &c." A factory chimney is scarcely an "ordinary wall," but this is perhaps a small objection, as the principles are the same. In the same division, second question, the forces acting on a roof are shown at varying angles, and the way to resolve these normal to the roof surface is by multiplying them by the cosine of the included angle, which cannot be done without reference to a table of natural or logarithmic sines, &c. In the third question, the weight per foot of a rolled joist of given dimension is asked, which depends on a formula rarely used in practice, as manufacturers' lists are depended on for the weight of various sections. This is not hinted at in the syllabus, which says, "he must be able to . . . determine the safe dimensions of iron or wooden beams subjected to dead loads."

Thus in Division II., out of three questions, two could not have been answered without reference to tables, and the third depended on a rarely used formula about the weight of iron girders, when only the "safe dimensions" are asked for in the syllabus, and these do not depend on the weight per foot. The examiners were also very strict in forbidding the students to take away the printed questions, although this, I understood, was allowed in previous years. Was this to prevent criticism?

The time allowed is the same (four hours) for Elementary Advanced and Honours divisions, which seems a mistake, as it is almost impossible to do full justice to a paper which entails a large amount of detail drawing and sketches in the same time allowed for an elementary examination.—Yours truly,

ANOTHER STUDENT.

HEREFORD CATHEDRAL FROM BELOW THE BRIDGE.

Views & Reviews.

HEREFORD CATHEDRAL.

THE interest of this little book depends not so much on its letterpress, as for the several delightful illustrations by Mr. Hedley Fitton, who possesses the ability to draw architecture in a "sketchy" manner while being truthful to the construction. This combination in a draughtsman is rarely found in the same degree; for either the technique of the drawing is excellent and the architecture depicted without knowledge, or the architectural construction shown correctly, but in a harsh and inartistic manner. It is the mark of excellence when the draughtsman combines these two qualities. Though Mr. Fitton's sketches form the main attraction of the book, still the Dean tells the history of this old cathedral in a very readable manner. The event which first brought the building to the general notice of Christendom was the murder of Ethelbert (king of the East Angles), an event variously related and embellished and one which resulted in Offa (king of Mercia) raising a costly church over the grave of his rival king; the church became that of St. Mary and St. Ethelbert. After the death of Offa and of his son, Mildred built "an admirable stone church" at Hereford, but at the end of 200 years it had so fallen into decay that Ethelstan, bishop in 1012, appears to have entirely rebuilt it; about forty years later, however, it was pillaged and destroyed by fire, together with a considerable part of the city, so that scarcely any remains of it are traceable. Soon afterwards Robert de Lozing, or Lorraine, commenced a new cathedral, which was completed by his successor, Bishop Reynhelm, and it is this structure which forms the bulk of the present edifice. The outer porch of the north entrance was erected by Bishop Booth in the sixteenth century, and "may be said to be the last work of the grand old bishop-builders, the work after that being restoration, or in some cases deformation, as was the case when the west tower fell in 1786, crushing in its fall much of the west end; the rebuilding of it was entrusted to James Wyatt, who substituted his own feeble Gothic for the fine Norman facade, triforium and clerestory, and shortened the nave by 16ft. It was well said by a writer soon after the rebuilding: 'It was only in ruins when the tower fell; it was not ruined until James Wyatt had done with it.'"

Hereford Cathedral contains examples of all the varieties of work from the Norman to the Gothic, and is therefore a singularly interesting building. Each successive builder worked in the style of his century, and seemed to be actuated by no desire for uniformity throughout the structure. "The student will find here the choicest specimens of both earlier and later architectural skill. He may see by what an easy yet perceptible gradation each style advances on the preceding. For instance, in the south transept may be seen some striking examples of early Norman of the eleventh century (possibly, although this is not certain, remains of Bishop Ethelstan's church, which was destroyed in 1055); the tall arches of wall arcade (similar to those in Lombardy); the balustraded triforium (like the eleventh-century transepts of St. Albans, Chester and Pershore)." The north transept is a fine example of Middle Geometrical of the thirteenth century, whilst Perpendicular work may be studied in the large windows of the south transept, and the Audley and Stanbury chapels. The choir has heavy masses of wall, like St. Albans and Chichester, supporting finely-carved arches and the magnificent triforium, the work of Robert de Lorraine. Transitional work may be seen in the retro-choir and what originally constituted the ambulatory; whilst the lancet of the thirteenth century is represented by the Lady Chapel. The cathedral is also rich in monumental effigies. At this time of the year it forms a delightful subject for a visit; and to those intending to take such a holiday, we would recommend this little book, written in an interesting manner and illustrated by a skilful draughtsman.

HEREFORD CATHEDRAL FROM THE WEST.

"Hereford Cathedral." By the Very Rev. Dean Leigh. Isbister & Co., Ltd., 15 and 16, Tavistock Street, Covent Garden, W.C.; price 1s. nett.

Builders' Notes.

Thomas Darby, master builder, of 2, Brighton Street, Nottingham, died recently.

Mr. Alexander Stephen, master plasterer, of Cameron Street, Stonehaven, died recently at the age of seventy-six years.

Mr. James Marsh, builder and contractor, of St. Annes, died recently. Deceased erected large blocks of property at Leigh, Chorley, and for the last twelve years at Horwich, where he was a member of the district council. His last undertaking was for 500 houses at Vickerstown, Barrow.

Sunday Building Operations.—When the report of the West Ham Town Council Works Committee was recently under consideration, Councillor Terrett called attention to the fact that in South West Ham building operations were carried on on Sundays. It was their duty to see that the plans were properly carried out. If builders were hard at work on Sundays, when the inspectors were having their day of rest, that was the day when their plans would be evaded, and when work would be done which was not in accordance with the plans. Of course they had no power to say these men should not build on Sunday, but the inspectors have power to go on Monday morning, and if they saw work done since the Saturday which was not right, they could have that work pulled down. He did not mind building going on on Sunday, but it ought to be inspected.

British Fire Prevention Committee.—The formal opening of the Committee's new fire-testing station at Westbourne Lodge, Bayswater, took place on Wednesday afternoon last, Mr. Edwin O. Sachs himself being present. Like their former premises at the side of the Regent's Canal, an old house has been utilised for the purposes of the Committee, in the garden of which two single and two double testing huts have been built; formerly they had only four single huts. During the afternoon tests were conducted with a ventilated floor, a suspended ceiling under wood joists and a partition, all by Bank's Fireproof Construction Syndicate, Ltd. The results of these tests will be published in our columns later, when the official report is issued. A large number of photographs of various materials and fittings subjected to fire tests were exhibited in the Lodge, as well as a model of the huts and gas-generating apparatus. This model was made by Mr. John B. Thorp, and is for an exhibition to be held at Berlin.

London County Council.—At last week's meeting the Technical Education Board brought up a report recommending the purchase for £45,000 of a site at the corner of Southampton Row and Orange Street, Bloomsbury, for the erection of a new building for the Central School of Arts and Crafts, now housed in Regent Street (see p. 301 of our last issue). The recommendation was adopted without discussion.—The Inebriates Acts Committee recommended that £17,660 should be expended on the provision of additional buildings at Farnfield to accommodate ninety inmates. This was agreed to.—On the recommendation of the Public Health Committee the by-laws under the Public Health Act, 1891, were amended so as to provide for the collection of house refuse in London not less than twice a week.—The Highways Committee recommended that tenders should be invited for the reconstruction, for electrical traction, of those portions of the London County Council tramways between (a) the junction of Kennington Road with Westminster Bridge Road and St. George's Circus; (b) the Elephant and Castle, along New and Old Kent Roads, New Cross Road, and Greenwich Road, to the terminus at Trafalgar Road, Greenwich; and (c) the Elephant and Castle, *via* Newington Causeway, to St. George's Church, Borough, and thence *via* Dover Street to the junction of New and Old Kent Roads. This was approved.—The Council have adjourned for the Whitsuntide recess until Tuesday, June 18th.

A Bronze Statue of Queen Victoria is being erected in the Dunn Square, Paisley, and the pedestal is now finished. The sculptor is Mr. F. J. Williamson, London.

RECONSTRUCTION OF GLASGOW ROYAL INFIRMARY.

The Executive Committee defend their Action.

OUR readers will doubtless recollect that some months ago considerable attention was drawn to the action of the Executive Committee respecting the plans for the reconstruction of the Glasgow Royal Infirmary, the Committee having overridden the selection made by their professional assessor, Dr. Rowand Anderson (see our issues for January 16th, January 30th and February 6th last). The Committee held a meeting recently, when a letter was read from the infirmary managers, who considered that the time had come for a definite policy to be adopted, and cited the following conclusions: (1) That an entire new hospital is an admitted necessity; (2) that the buildings on the north side, estimated to cost about £77,000, should be erected first; (3) that the money required for the entire new hospital, estimated at about £170,000, in addition to the £82,000 already in hand, should be subscribed before anything more is done; (4) that Lord Provost Chisholm, as head of the municipality, should be invited to initiate and guide the enterprise for the obtaining of subscriptions; (5) that the sum of £82,000 above referred to should be held *in retentis* to pay the cost of the front or south block when it comes to be erected; (6) that the new hospital, and not a section of it, should be regarded as alone worthy of the city of Glasgow, and as a fitting memorial to the sixty-three years' illustrious reign of the Queen.

The Committee next proceeded to consider the statement for the public formulated by their special sub-committee, and unanimously approved and adopted it. In the course of this statement it is said:—

The Site.

In regard to the site, the managers and the majority of the medical staff are agreed as to its perfect suitability. Dr. Russell, late medical officer of health for the city, has pronounced decidedly in its favour. It is situated in the very heart of a vast industrial population. It has been the universal experience of great towns that their large hospitals must be in the centres of the populations. It is so in London, with all its great hospitals, almost all of which are in crowded localities, the only exception being St. Thomas's, which was so fortunate as to secure a site on the river bank. St. Bartholomew's is at Smithfield, closely surrounded by narrow crowded streets; Guy's is in the congested district near Tooley Street; the London Hospital, the largest in the metropolis, is in Whitechapel; the Middlesex is in one of the most densely-built parts of London; King's College is everywhere surrounded by tall houses, and is approached only by narrow lanes; and University College Hospital, now being rebuilt, has four streets of houses for its boundaries.

In Manchester the case is still more pointed. There the Royal Infirmary is in the heart of the city, surrounded by business buildings, and the site is very valuable. It also requires to be reconstructed, and after long and anxious discussion, a strong party having favoured removal, it has been resolved to rebuild the entire infirmary upon its present site, which is not only more valuable but less desirable otherwise than ours.

The present site of the Glasgow Royal Infirmary is far superior to that of the Manchester Infirmary and to any of those in London that have been mentioned, with the exception alone of St. Thomas's. On one of its four sides it has the large and open Infirmary Square, on another it has the Necropolis, on a third, under the plan adopted, there will be a distance from the greater number of its windows of 250ft. to the buildings on the opposite side of Castle Street, and these great open areas are necessarily permanent and must remain to the infirmary in all time coming. In short, there is no other site in the city, or its immediate neighbourhood, that, in so far as open space and free ventilation are concerned, can at all compare with the position of the present institution for the erection of a great city infirmary.

Number of Beds.

Another question that has been discussed is the number of beds that should be provided in a new hospital on the present site, and it has been urged that in the future fewer beds than at present should be provided; that the site is much too small to permit of anything like the present number of 600 beds. It is true that in many of the wards of the present building the cubic space per bed is greatly insufficient, but this in no way disposes of the question. The plan adopted by the Executive Committee provides a cubic space for every one of the 660 beds as ample as the most advanced hospital reformer ever alleged to be necessary, and in every ward there is the fullest through-and-through ventilation from windows placed along the walls from end to end of the wards, in addition to whatever system of artificial ventilation may be adopted.

St. Bartholomew's Hospital has 600 beds, Guy's Hospital has 600 beds, the London Hospital has over 800 beds. All of these hospitals are on sites smaller than that of the Glasgow Royal Infirmary. It is true that this provision of ample bed space in our hospital is only to be obtained by carrying the buildings to a height of six storeys, but with the adequate provison of lifts this great height, so far from being a disadvantage, will be a decided benefit, and it will probably be found that the members of the professional staff of the infirmary will compete with each other for the upper floors.

Further, in the plan adopted by the Executive Committee the buildings are so arranged that only the minimum of shadow will be cast by any one block on any other, and this is one of the merits of the plan.

An Explanation regarding the Plans.

In regards to the plans this must be said: The Executive Committee and the managers bestowed on the subject lengthened and painstaking consideration. Authorities on hospital construction were consulted, visits were paid to the best hospitals in Great Britain and America, and the views of the staff of the infirmary as to the general conditions and requirements of the institution were carefully ascertained. As a result of this seven sketch plans were, under direction of the managers, prepared by Mr. George Hill, comprehending the provisions specified by the staff, and after due consideration agreed to by the managers as necessary for an infirmary which was desired to be abreast of the foremost institutions of the kind. Of these sketch plans, two which were specially selected by the managers were submitted to ten selected architects, but were distinctly stated to be "suggestive and illustrative only," not binding.

To assist the Executive Committee in deciding on the competing plans, Dr. Rowand Anderson was appointed as their assessor, his function being, as he himself frankly acknowledged, to guide and advise, not to select. When the final selection was made the Executive Committee fixed on a plan which the assessor reported as being one of two which most closely conformed to the sketch plans. The other of these two plans the assessor had placed first of all, but he had not included in his short leet that fixed on by the Executive Committee. Further interviews with the assessors satisfied the Executive Committee that its exclusion arose from no failure on the part of the selected plan in regard to vital or essential particulars, but chiefly from a difference of opinion in regard to the style of architecture and the general elevation—matters on which the Executive Committee ventured to think they were quite entitled to follow their own opinion, and the minority cordially acquiesced in the selection of the majority.

Internal Arrangements.

As regards internal arrangements, the plan selected by the Executive Committee is to be preferred for the following reasons: Firstly, that it provides on the main floor through-corridor communication from end to end of the building without passing through any of the wards. Secondly, on account of the superior lighting of the wards, by which every bed shall have share of a window for light and ventilation. Thirdly, that the venereal ward shall be isolated from all other wards. Fourthly, that small wards or side rooms are conveniently situated so that they can be entered without passing through the main wards. Fifthly, it gives a promenade on the roof for convalescent patients. Like most other plans of similar magnitude the internal arrangements of this plan are in some respects no doubt open to modification and improvement, and every care will be taken by those responsible for the work to ensure that all the arrangements shall be as perfect as possible.

Dwarfing the Cathedral.

It has been alleged that the buildings being so lofty will dwarf the cathedral. The buildings must be lofty if the hospital requirements of the public are to be adequately met, and the Executive Committee believe that they have shown discretion in approving the architectural style of the adopted plan. It is distinctively Scottish—the national art of the fifteenth and sixteenth centuries, of which we have examples in Heriot's Hospital, Holyrood, Linlithgow and Falkland palaces, and in our own old College lately in the High Street.

It is, therefore, not only appropriate to the historical associations of the site upon which stood the castellated Bishop's palace, but permitting, as it does, a limited use of Gothic forms as in Heriot's Hospital, Edinburgh, it is more in harmony with the cathedral itself than any classic or modern style. It was not, however, this consideration but the superiority of the plans which chiefly influenced the judgment of the Executive Committee. A careful consideration of the circumstances seems to suggest that the proper course out of the difficulty which has arisen is to face the entire reconstruction. It is undoubtedly more than the original idea with which the scheme was started, but it is not more than the necessities of the infirmary require; it is not more than the reputation of the city for public spirit and for determination to have all its institutions fully abreast of the times demands; and it is not more, when a good case is put before them, than the liberality of the citizens can overtake. The reconstruction of the entire infirmary is estimated to cost at least £250,000, so that a further sum of about £170,000 is required. It is a citizens' scheme, and must be treated as such. It must be fairly put before the citizens, and they may be safely left to see it carried through.

Law Cases.

Sueing the Commissioners of Works.—The case of *Graham & Sons* v. *The Commissioners of Works and Public Buildings* was heard in the King's Bench Division of the High Court of Justice on Wednesday last. It was an action brought to recover damages for breach of contract and for wrongful conversion of builders' plant. The plaintiffs, who were builders and contractors, in September, 1899, entered into a contract with the Commissioners of Works and Public Buildings to erect a post-office at Stalybridge, in Lancashire.—The Court gave judgment for the plaintiffs. Mr. Justice Ridley said that the matter depended upon the general principle that an officer of the Crown was not liable to be sued in respect of a contract made by him as agent of the Crown, and the question was whether the Commissioners of Works in this case were acting as agents of the Crown or not. There were several decisions on the point. In this case no such relation existed between the Commissioners and the contractors as existed between the parties in *Gidley* v. *Lord Palmerston*, and his Lordship drew the inference from the fact that the present was a case in which the defendants expressly contracted for themselves. That being so, they must be treated as liable under the contract. Mr. Justice Phillimore said that he was of the same opinion. The only question, therefore, was whether the Commissioners of Works were within the class of officials who could sue and be sued for acts done on behalf of the Crown. There was no reason why they should not belong to that class, and in his Lordship's opinion the mere fact of incorporation conferred on them the privilege of suing and imposed on them the liability to be sued. He saw no reason why their liability should be restricted to the Acts with regard to which the liability had been specifically imposed. In his opinion there was a general liability upon the Commissioners to be sued, though the Crown property, if they had any, could not be seized.

New Patents.

These patents are open to opposition until July 1st.

1900.—Stone-Working Machinery.—7,406. F. Trier, 1, Great George Street, Westminster, S.W. The machine, having rolling cutters, is provided with two or more cutters working in steps, the finishing one being held in a toolholder actuated by a stop-rod and rocked automatically.

Sewage Filters.—7,834. D. Cameron, 1, Sylvan Road, Pennsylvania; F. J. Commin, 7, Bedford Circus; and A. J. Martin, Bradninch House: all of Exeter. One of the objects of this invention is to accelerate the filling of filters by storing up a quantity of sewage in a tank and releasing it suddenly. The action is reciprocal, the discharge valve being closed when the admission valve is opened, and *vice versa*, this being effected by floats. Means are provided for locking a lever so that the admission valves cannot be opened until the desired quantity of liquid has accumulated in the tank.

Lifts.—10,426. F. Garside, 14, Bouverie Street, Chester; W. Carter, Bank Villa, Helsby, Cheshire; and The Hydraulic Engineering Co., Ltd., of Chester. On the wall of the lift shaft are fixed as many positive strips as there are floors, and a return or negative strip. A brush is attached to the cage, and the latter has a rope grip operated by a spring and released by a solenoid. The operator sets his brush to rub on the strip corresponding to the floor he wishes to reach. The current then passes and the lift is moved until the floor is arrived at, when the current is automatically broken and the lift brought to a standstill by the rope grip.

Fixing Tiles.—11,403. J. A. Dobbie, Waverley Works, Pattison Street, Leith, N.B. The tile is fixed by a screw in the centre, the head being covered by a button which may be of the same material as the tile.

Metal Hearths.—11,543. W. L. Dennis, 224, Mary Street, Balsall Heath, Birmingham. The hearth is made of a mild-steel plate, enamelled as desired, with a pad of asbestos underneath.

Sewage Screens.—11,632. S. H. Adams, Cumbrae Park Avenue, Harrogate. The screen is so constructed that as it is drawn up it closes and forms a basket in which floating matter is caught. When brought to the surface a suitable part opens and enables the matter to be readily removed.

Automatic Fire Shutters.—11,696. R. L. McIntyre, Toronto, Canada. The shutters are normally held open by a wire. When, however, the temperature reaches a dangerous point a ring on the wire fuses and so allows the shutters to be automatically closed by springs, being securely fastened by dogs.

1901.—Street Sweepers.—2,446. P. Haerst, 566, North Clark Street, Chicago, U.S.A. The machine consists of an adjustable shovel at one end with means for conveying the dirt to a central hopper, while at the opposite end is a circular brush also provided with means for taking the sweepings into the hopper.

Sash Pulleys.—5,319. A. V. Campbell, 6, Coleraine Road, Hornsey, N. The invention consists of a slot-headed screw (passed through the stile) having wheels running on it, with or without mortise linings.

The following specifications were published on Saturday last, and are open to opposition until July 8th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1900.—7,870, Darrah, siphon-flushing cisterns. 8,409, Warren, manufacture of cement. 9,537, Ross, acetylene-gas generators. 9,709, Row, pulleys. 9,819, Reeves, sewage treatment. 10,519, Goddard, windows, fanlights, &c. 10,549, Shaw, lift valves. 11,007, Case, construction of groynes, breakwaters, &c. 11,151, Smith, chimney pots. 11,462, Hodkin, slabs for walls or partitions. 11,508, Ledowsky & Cambiagio, pipe couplings. 11,510, Grube & Sanny, flushing cisterns. 11,518, Follows, cone mills for grinding paint. 12,803, Schmidt, kilns for burning cement and lime. 23,602, Boult (*Segalerba*), ceilings, walls, &c.

1901.—22, Ingham & Langton, machinery for making tapered, radial and other bricks. 3,445, Manke, safety locking-gear for lifts. 4,015, Jackson, pipe wrenches. 4,125, Lake (*National Package Co.*), manufacture of fibrous compositions. 6,421, Smith, water-closets. 6,538, Glassup, Venetian blinds.

CITY OF LONDON LUNATIC ASYLUM.

The chapel and new buildings at the City of London Asylum, Stone, were recently inspected by the Lord Mayor and members of the Corporation, at a state visit to that institution. The improvements which have just been completed were commenced in February, 1898, from plans prepared by the City Surveyor. The male and female hospitals are connected to the east and west ends respectively of the original structure, and are projected southwards into the gardens. The male hospital is not altogether a new building, a portion of the old hospital ward having been reconstructed and formed into a day-room, dining-room and bath-room, with a large dormitory on the first floor. The new building contains a hospital ward with fourteen beds, a day gallery, six single rooms, two attendants' rooms, and other necessary accommodation, all on one floor. The female hospital is a new building on the ground floor, with accommodation for fifty patients. There are two large hospital wards, containing sixteen beds each, one for sick and the other for infirm cases, with a small dormitory for working patients. A separate dining-room is provided. There is also a central day-room with day galleries to the right and left, all facing south.

Opening out of these galleries are nine single rooms and four nurses' rooms. The new laundry block comprises three sections—general, staff and foul. The two last-named are of equal size, and each has a washhouse and drying, airing, finishing, receiving and delivery rooms. The old laundry block has been converted into a block containing the housekeepers' cutting-out rooms, a mess-room and sleeping-rooms for the laundry staff, together with new engine room, and day and sewing and mending rooms, with kitchens, &c. To the west of the laundry is a new mortuary, with laboratory and pathological room. This building is being fitted with conveniences for carrying on the finer pathological investigations now common in most public asylums. The recreation-room, which was formerly the chapel, has been much changed, as a stage 35ft. by 27ft. has been constructed over the kitchen, with two dressing rooms and a fire escape staircase. A new floor for dancing has been laid of 3in. pitch-pine boards.

The chapel is a distinct building, erected about 80yds. to the north of the administrative centre. The style of architecture is Early Perpendicular, and the external walls are faced with flints found in the local chalk quarries, the dressings and finials being of brown Portland stone. Internally it consists of a nave 72ft. by 36ft., lighted by five two-light windows on each side, and a five-light window in the west gable. At the west end there are two entrances, and adjoining each entrance is a small room in case of need for epileptic patients. The floors of the nave and entrances have been laid with wood blocks on a concrete foundation. The hammer-beam roof of the nave, which is a feature of the interior, is also in oak. The chancel, 25ft. wide, is formed with an octagonal eastern end, lighted by a single-light window in each side of the octagon. It is paved with encaustic tiles, and the walls are faced with alabaster in panels. The organ, cased in oak, has been erected by Messrs. Henry Speechly & Son, of the Camden Organ Works, Dalston. Wind is supplied from bellows and feeders fixed in the chamber beneath, and worked by two hydraulic engines. The windows of the chapel are of stained glass, by Messrs. Heaton, Butler & Bayne, the five single-light windows in the chancel representing "King David," "Isaiah," "The Good Shepherd," "St. Paul," and "St. Peter," arranged in the order named. Appropriate emblems of each figure appear in the tracery above. The west window, consisting of five lights and tracery, contains the figures of the "Light of the World" and the four Evangelists, the tracery containing emblems and texts referring to the central figure.

The lighting of the asylum has been improved throughout, and the present opportunity has also been taken to entirely reorganise the fire alarm, tell tale and telephone systems. At the same time the telephone system is being considerably extended so as to comprise both a complete and extensive exchange system, and also direct lines between various parts of the asylum where immediate communication may be required during the night.

The farm, which has recently been enlarged to 170 acres, is now in excellent order, and is of valuable assistance in providing healthy labour and recreation for the rate-paid patients, while at the same time it supplies them with fresh and wholesome food. The old farm buildings, of small value at the time of purchase, have been thoroughly restored, and other new buildings erected to meet requirements for live and dead stock, stores and implements. The electrical installation has been carried out under the supervision of Mr. A. A. Campbell Swinton, C.E., and the alterations to the heating and warming apparatus under that of Mr. W. H. Beck, M.I.M.E. The names of the various contractors are as follows: Washing machines, coppers, &c., Messrs. Bradford & Co., Messrs. Manlove, Alliot & Co., and Messrs. Tullis & Co.; the buildings generally, Mr. Charles Wall, of Chelsea; the water-softening apparatus, The Atkins Filter & Engineering Co.; the heating and warming plant, Messrs. Rosser & Russell; the electric lighting and power installation, Messrs. Mayor & Coulson, Glasgow; and the tell-tale, fire-alarm and telephone work, Messrs. Cox-Walkers, of Darlington. The interior fittings of the chapel have been polished by "Ronuk," Ltd., 83, Upper Thames Street.

NEW HOSPITALS IN VIENNA.

In addition to the great public works projected by the State in Austria, some others of almost equal interest have been decided on by the Vienna Town Council. They are intended as adjuncts to the celebrated medical school, the Wiener Allgemeines Krankenhaus, in the Alserstrasse, which, with its many clinical institutes, its numerous and spacious wards, and its concentration of the best material for clinical observation and research, is the most extolled, and, at the same time, the most criticised public hospital in Europe. While the high reputation of the professors of the Vienna Medical School, and the facilities given to medical men from abroad, are everywhere recognised, the crowded state of the wards, the disturbance due to street traffic and the scarcity of room in the clinical institutes are often the subject of unfavourable comment. It has at last been proposed to erect clinical institutes, with a total of about 2,000 beds, within easy distance from the present Allgemeines Krankenhaus, and, at the same time, away from the noise of heavy traffic, and in a somewhat better atmosphere. The best site available is that now occupied by the Lower Austrian Lunatic Asylum. The proposal is that this and the adjoining Asylum for the Aged and Infirm should be bought by the State for 17½ million kronen. The Town Council has now given its consent, and the Diet of Lower Austria will shortly be asked to vote for the project. No fewer than 220,000 square mètres will be available for building purposes, and it is intended to erect on the site upwards of forty separate pavilions, including seventeen clinical institutes, with 2,000 beds altogether, which is as much as the old Krankenhaus itself contains. It is hoped that the new buildings will be ready within ten years. There will also be a large new hospital for slight cases on the Wilhelminenberg, outside Ottakring, a separate lying-in home and gynæcological institutes at Gersthof, also near the Wiener Wald, a new lunatic asylum for the province further away, a large citizens' asylum for the Viennese at Lainz, and, finally, a large home for convalescents, to be erected by the State in the midst of the Wald. Altogether the new buildings are estimated to cost £2,000,000 sterling, and the expenditure will probably amount to as much again. In Austria provision for the sick is not a private affair; all hospitals and institutes being erected and maintained either by the State or by the towns, or by both together, out of the rates and taxes.

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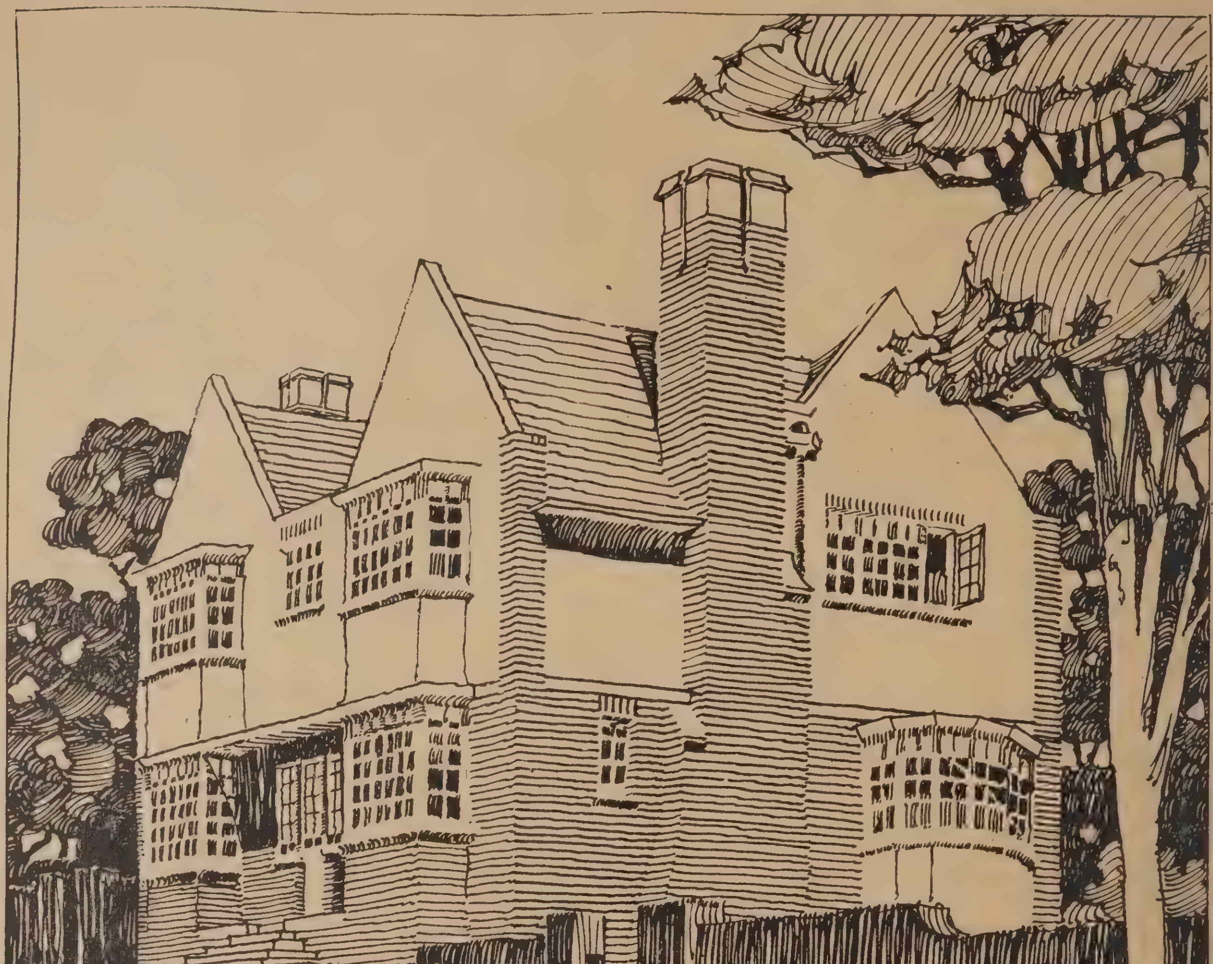

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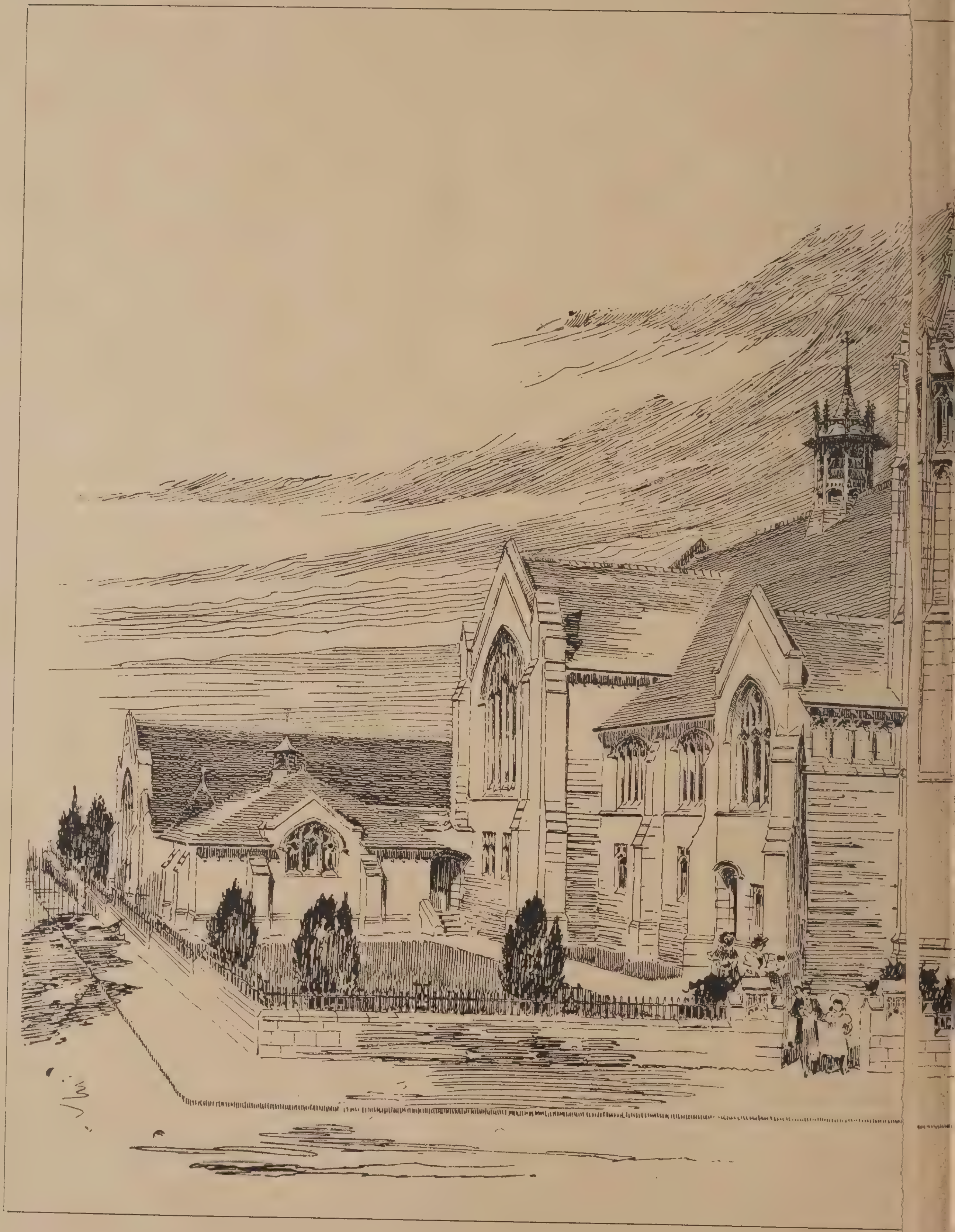

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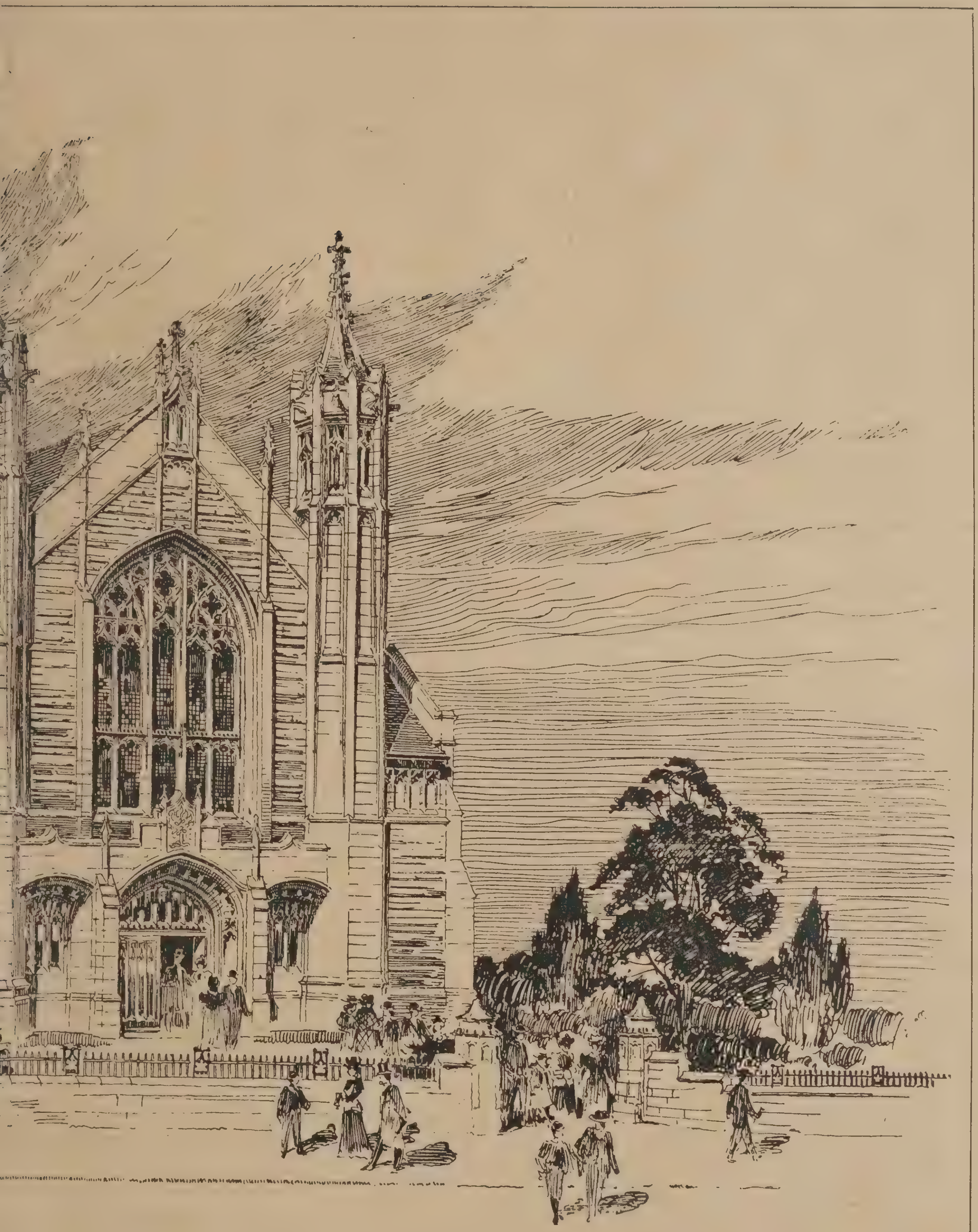

SGOW. Miller and Black, Architects.

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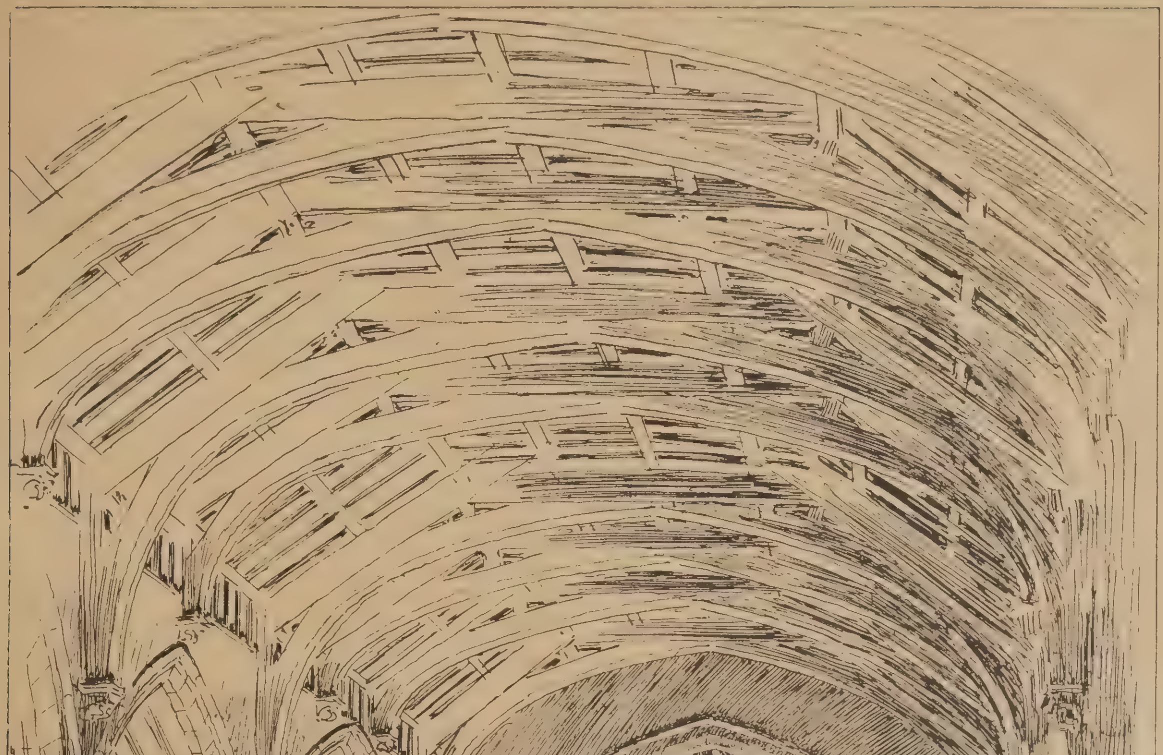

SHAWLANDS UNITED FREE CHURCH, GLASGOW.

Miller and Black, Architects.

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Bricks and Mortar.

APHORISM FOR THE WEEK.

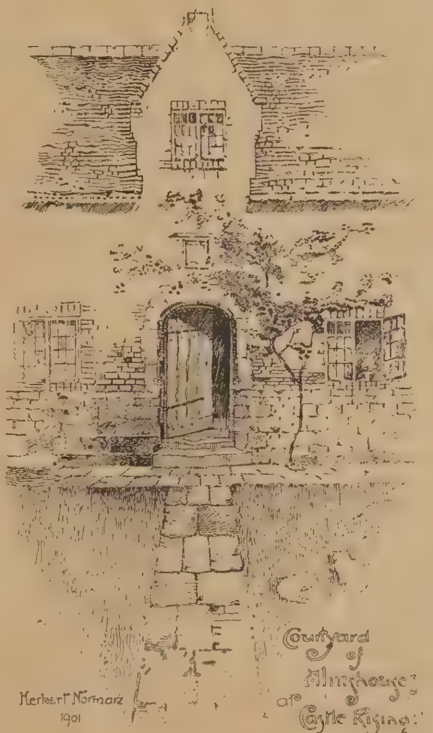
A true artist should put a generous deceit on the spectators, and effect the noblest designs by easy methods.—BURKE.

Our Plates. THE memorial stone of the Shawlands United Free Church, Glasgow, was laid recently. The church occupies an important site at Shawlands Cross, and will, when completed, have a commanding appearance from the road. The main entrance is fronting Shawlands Cross, with massive octagonal turrets on either side 70ft. high, which will form a prominent landmark in the district. The style of architecture is a broad treatment of fifteenth-century Gothic. The church is seated for 1,016 persons, and the pews are specially spaced for comfortable sitting. In addition to the church there are large and small halls, a large session-house seated for sixty-five persons, vestry, classrooms, &c., and a church officer's house. The architects for the work are Messrs. Miller & Black, of 58, Renfield Street, Glasgow.—The small country house by Mr. F. Winton Newman, architect, of 58, Savernake Road, Hampstead, N.W., was designed for a sloping site, and would be built in brick, the first-floor walls covered with rough-cast, and tiles used for the roof. The accommodation on the first floor consists of six bedrooms, bathroom, w.c., &c.

The Late Mr. Gregg. THE death of Mr. Ebenezer Gregg, of 1A, St. Helen's Place, London, E.C., which was announced on p. 307 of our issue for last week, occurred on May 14th at Teighmore, Sutton, Surrey. At the early age of thirteen years Mr. Gregg left school and entered the office of Mr. Sabine, architect, of Old Broad Street, where, before he attained the age of seventeen, he was appointed manager, which post he retained until 1868, when he commenced his practice at 1A, St. Helen's Place. He quickly succeeded in establishing a large and influential business. He was elected a Fellow of the Royal Institute of British Architects in 1870, and at the time of his death had been for many years Examiner on Professional Practice and Specifications. While his practice was chiefly domestic, he was an architect of wide scope. Some of his chief works were: Dr. Barnardo's Village Home at Ilford; officers' quarters, ice house, &c., and offices of the Royal Mail Steam Packet Co., both in Southampton and London; Moody and Sankey's temporary mission hall, to seat 10,000, erected in six weeks; the Banks of Adelaide, New Zealand and New South Wales; and more recently as London architect for the Exploration Company's building in Johannesburg, and the works at 71 and 72, Piccadilly, 24, Austin Friars and 141 and 142, Fenchurch Street. For many years he had acted as surveyor to Jesus College, Cambridge. His death, at age of sixty-eight, will be deeply regretted, especially among students, for whom he always had a helping hand. He will be succeeded by his son, Mr. Theodore Gregg.

The Stock Exchange. THE centenary of the Stock Exchange was recently celebrated. The nomenclature "Stock Exchange" was not coined until 1773, when, on July 14th of that year, some of the leading brokers hired rooms for business purposes at New Jonathan's in Sweeting Alley, and passed a resolution that it should be called "The Stock Exchange"—"which is to be wrote over the door." The brokers then collected sixpence each and christened the house with punch. The first stone of the first real Stock Exchange was laid on May 18th, 1801. The architect of this building was James Peacock. The building, a very plain one with a stone front—except the attic, which was of brick—was opened for business in March, 1802; whereupon admission was regulated by vote by ballot, and ten guineas a year fixed as the subscription, the members at that date numbering 500. The innovation of regulating admission, however, met with bitter opposition from certain quarters. As only the wealthier members of the association had provided the capital for the new building, the Stock Exchance henceforth consisted of two distinct bodies—proprietors and subscribers. Notwithstanding this improved accommodation, the steady increase of business caused an overflow of jobbers and brokers, who sought shelter in the Rotunda of the Bank, where they became a great nuisance, and indeed often created such an uproar that the beadles were provided with rattles, which they sprung when the noise became deafening. These gentry were ejected from the Rotunda in 1838, and the space employed in cashing the dividend warrants of the fundholders. In 1854 Peacock's original Stock Exchange gave place to the present building, erected after the designs of Thomas Allason, jun., which, after being enlarged on one or two occasions, was supplemented in 1885 by a great annexe, equal in size to, but of an entirely different shape from, that of the original building. This was designed by Mr. J. J. Cole, and comprises the additions in Throgmorton Street and in Old Broad Street. The interior of the New Exchange, with its second dome, is lined with marble. Capel Court, in which it stands, was so called from the London residence and place of business of Sir William Capel, ancestor of the Capels, Earls of Essex, and Lord Mayor of London in 1504.

Almshouses at Castle Rising. THE drawing of the courtyard of almshouses at Castle Rising, by Mr. Herbert Norman, is probably somewhat fanciful, as it is made from a very rough pencil sketch jotted down whilst resting in the middle of a cycle ride.


Herbert Norman
1901
Courtyard of Almshouses at Castle Rising.

St. John's Priory Church, Clerkenwell. THE nave of the ancient crypt of the Priory Church of St. John at Clerkenwell, was opened last week for parochial purposes by Earl Egerton of Tatton, Chancellor of the Order of the Hospital of St. John of Jerusalem in England. The crypt is of great antiquity, having been erected by the Knights of the Order of St. John about the year 1100. This was the original chapel, and consists of five bays, with side aisles or chapels to the eastern part, that on the north side being of one bay only, and that on the south of three bays. There are chambers of minor importance on the north side, westward of the aisle. In the latter part of the twelfth century, about the year 1175, the erection of a grand priory church having been determined on, the original chapel, with the extension then made to the eastward, became a crypt under the choir of the new church. This church was consecrated by the Latin Patriarch of Jerusalem, Heraclius, in the year 1185. There is no structure of its kind in London worthy to be compared to the crypt, which, on account of its great antiquity and its historic associations, as well as on account of its intrinsic architectural merit, has well deserved to be rescued from its dilapidated condition and to be put into its present state of good repair. The building has been restored at a cost of £800. The rector is now very anxious to restore the remaining portions of the building, but £500 is still required.

Finsbury Circus. FINSBURY CIRCUS is being completely transformed, more than one half of the circuit being already occupied by lofty stone mansions, in the place of the insignificant brick houses of which many on the opposite side for the present still remain. More than one attempt to get possession of this large open space so close to Moorgate Street and the Bank has been made by railway projectors; but the costly property now rising in this locality, not to speak of that imposing structure the London Institution, must serve still further to daunt them. The circular garden, with its trees and plant and grass plot, will, presumptively, now be equally safe. Like Finsbury Square, which is further from the heart of the City, and is some twenty years older, the circus was originally designed entirely for private residences, and nursery rails may still be noted across the upper windows of some of the original houses. For many years past, however, the houses have been let out in chambers to merchants and other business folk. Finsbury Circus was built about 1815, soon after old Bethlehem Hospital was removed from here to its present site. In front of this quaint old hospital—that is, on the spot now occupied by the circus—was once to be seen a considerable expanse of turf, with sheep feeding and citizens promenading in shady walks.

Richmond Hill. THE view from Richmond Hill, it is feared, may be seriously affected. Land on the Middlesex side of the river, in the parish of Twickenham, is being rapidly covered with bricks and mortar. The Lebanon House and the Marble Hill estates, which form a pleasing feature of the view from the hill, are said to be in danger of attack by the builder. At a meeting of the Twickenham District Council the offer of Lebanon House and grounds for parochial offices, including a Free Library, for a sum of £6,000, was not entertained, although the would-be vendor had offered to contribute £250 for the laying-out of the riverside land as a public garden, and to pay £500 towards the cost of preparing the building for the Council's use. Mr. Max Waechter, a well-known resident of Richmond, has set an excellent example to brother philanthropists by his presentation of Petersham Ait to the borough.

A Gothic Archway at Gray's Inn. WHILE making some minor alterations to the hall of Gray's Inn, the workmen have come across an archway which is at least 400 years old. They were widening a doorway, when they came across stretches of carved stone. The stucco was taken away, and it revealed a beautiful arch of the late Perpendicular style. On each side there had been a coat-of-arms, but the Philistine with the stucco had scraped one of them away to make a good surface for his plaster. The other remained almost perfect. The arms, which are surrounded by the Garter, are those of Charles Brandon, Duke of Suffolk, who was the only Duke of his line, and is not to be confounded with the present Earls of Suffolk. His title was created in 1514, a fact which justifies the view of Mr. Bodley, A.R.A., who, on seeing the arch before the shield had been traced, gave the date as about 1480. The only thing remaining is to trace the connection of Charles Brandon with the Inn. Searches are being made at the British Museum for the purpose. The discovered archway appears in old prints as the front door of the hall; but it was always assumed that the arch had been swept away. Gray's Inn has suffered badly from the stucco fiend, the whole building being once covered, and it is only four or five years since this was removed, showing the hall in its true colour of Elizabethan brick.

THE NEW NORTH BRIDGE STREET, EDINBURGH.

THE eastern half of North Bridge Street, Edinburgh, has now been completed, and marks another important stage in what, when it is completed, will be one of the most important street improvements that Edinburgh has seen for many years. In the reconstruction of the North Bridge, in the widening of the street, the demolition of the old houses, and the erection of the large blocks of buildings, still in progress on the west side, there will have been spent in this city improvement by the Corporation and by private enterprise, within the last few years, over one million sterling of money. The new buildings now finished on the east side are of an imposing character. "The Scotsman" buildings will occupy the other side of North Bridge Street. The improvement on this the main thoroughfare between the Old and the New Town was embodied in the Edinburgh Corporation Act of 1896. The "Scotsman" took the whole of the west side of the street at a cost of £120,000; and on the east side the south block was acquired by the Commercial Bank, which erected thereon a larger building, of which their branch bank forms in the angle a prominent feature. The remainder of the eastern side of the street, two-thirds of the whole, was purchased from the Corporation by Mr. John White, builder, for £70,000, and it is his part of the scheme, extending from the Commercial Bank Buildings to the North Bridge, with a frontage of 357ft. to North Bridge Street and of 120ft. to Jeffrey Street, overlooking the railway valley, that has now been, after the lapse of only two years, completed. The designs were by Messrs. George Beattie & Son, Edinburgh, the architects of the new North British Railway Hotel; and are in the Scottish Baronial style of architecture, with frontages to North Bridge Street and to the north, overlooking the valley. In the angles are turrets surmounted by copper domes; the central feature on the North Bridge Street front is the spacious entrance to the Bon Marché, which at the higher level breaks into a massive gablet flanked with turrets; and, for the rest, the windows have pedimented heads, and there are ornamental string courses and other decorative features. From the North Bridge Street level Mr. White's buildings practically rise five storeys, but they descend by another four to Jeffrey Street, and their foundation is carried down to the railway level. Something like 30,000yds. of earth had to be removed before the rock was found on which to build. This was from 30ft. to 40ft. below Jeffrey Street. On the rock was spread a solid basis of concrete, and the whole of the inner supporting walls were raised therefrom of Staffordshire brick, while the external walls, front and back, are all of polished ashlar, with the shop fronts of red polished Aberdeen granite. The floors are carried on steel girders, and are of fireproof construction. From the foundations to the top of the highest tower is 201ft.; the general elevation along North Bridge Street is about 80ft. in height.

There is a line of shops on North Bridge Street—seven in number, with considerable window space. In the north-east block has been placed an hotel—"The Carlton"—the chief entrance to which, with access from North Bridge Street, has been ingeniously constructed at the end of an open terrace carried on screened girders, along the north face of the building. The hotel descends to Jeffrey Street, where there is an entrance handy to the railway, and a lift works from the basement to the top of the building. There are about 120 rooms in all in the hotel. The main entrance hall and corridor are domed; the corridors on all the floors are spacious, and a feature has been made of the decorations of the public rooms. The commercial room has Elizabethan forms, the restaurant Celtic, the grand dining hall Egyptian, and there is a reading-room in the Adam style, with Chippendale furniture in old rose and the walls panelled in yellow satin wood. One of the floors below the North Bridge Street level of the main building, a spacious hall, lit by electricity, has been set apart as a billiard saloon, in which there are no fewer than thirty-five tables; while the *pièce de resistance* of the block is what is to be known as the Bon Marché, which is 120ft. long, 100ft. in depth, and with a well in the centre 45ft. square, rising from the North Bridge Street level through five floors, where it is crowned with a steel cupola filled in with stained glass. This part of the building has been specially arranged by the architects and builders for the conduct of a large drapery and general business. Its entrance for the arrival and delivery of goods is on the Jeffrey Street level, where are water heating-apparatus, motors for working numerous goods and passenger lifts, and for compressing air for the Lansome cash tubes with which the Bon Marché is freely fitted. By means of this well, and from ranges of windows on each side, this spacious shop, with its five large galleries, is flooded with light. The shop floor and stairs are of marble, the flooring of the galleries is of pitch-pine and oak parquetry, and the well balustrades and internal fittings in solid dark oak. The whole of the west side of the first floor gallery is set apart as a tea and luncheon room, and rooms have been allocated for reading and writing, for music and other entertainments, and a large part of a gallery has been partitioned off as a smoking- and coffee-room for gentlemen. The kitchen is on the top of the house, connected by hoist and Lansome tubes with the restaurant, and there also are work- and dining-rooms for the staff. This block, including the site, has cost about £300,000. Of that sum the Bon Marché, with its stock and furnishings, is credited with something like £150,000.

CELEBRATED ANCIENT BUILDINGS.*

BY JOHN SLATER, B.A., F.R.I.B.A.

IN the preface to the first edition of his "History of Architecture" Mr. Ferguson uses these words: "Beauty in architecture does not reside in pointed or in round arches, in bracket capitals or horizontal architraves, but in thoughtful appropriateness of design and architectural elegance of detail." Although it requires education in design to appreciate the full force of this remark, yet the average man with only hazy notions of art will feel its truth without knowing why; for whether you place him before the majesty of the Parthenon or the ruins of Imperial Rome, or stand him in some great mediæval cathedral where

> " . . . the blessed saints are smiling dumb
> From the rich painted windows of the choir
> On aisle and transept,"

his whole nature will be impressed with the grandeur of the building. Critical analysis may explain for us the wonderful refinement and beauty of the curve of the entasis of a Greek column, may show us the proportions of architrave or pediment, the detail of string course, capital or cusping, but for the great majority the general effect of the whole building will be what will stir the emotions and not the fact of its being in this or that style of architecture.

During the last century there were frequent revivals of styles among us, the chief features of which have been the undue exaltation of that particular style which became fashionable and the excessive depreciation of all others. People are too apt to forget—especially those who pose as leaders and directors of the public in matters of taste—that in the history of the world no system or style, whether in the religious, the political, the social or the artistic sphere, has ever arisen that has not in it some germs of good and was not prompted by some wise reaction against the faults and excrescences of a previous system. And if this is true of the origin, development and decline of the various phases of architectural art known as "styles" through the characteristic features of the buildings which were erected at various periods, still more is it the case in modern times, when we either copy and adapt for our new requirements the methods of former ages, or else are so eager to devise something new that we are ready to acclaim as a new genius the extreme of faddism and eccentricity. The present generation of architects has seen the rise and decline of Modern Gothic whereto has succeeded a modern renaissance, of which we may almost assert with Horace that it appears likely to give birth to a more unworthy offspring. For the present I am going to ask you to accompany me a very long way back down the pathway of Time to a period anterior to all the recognised styles, so that we may see what kind of buildings the ancient peoples of the world erected and how they constructed them, when the sole object of the builders was to put up an edifice that would exactly meet the requirements of those who were to use it and who obtained architectural effect by ornamenting their construction and not by constructing their ornament.

The First Builders.

The origin of building, like everything else, is lost in the mists of antiquity, but the probability is that at first natural shelters, such as caves, would form the dwellings of primeval peoples, and that subsequently the most easily manipulated material, such as wood, would be used for construction, and wooden forms were very frequently reproduced in stone buildings.

The first builders who attained to any architectural skill were that great branch of the old Turanian race which settled on the banks of the Nile and founded the kingdom of Egypt. Here we get the first records of authentic history, but it is absolutely certain that ages and ages must have elapsed before the Egyptians arrived at such a state of civilisation as to enable them to erect the magnificent structures which have so largely defied the tooth of time. Four special periods in Egyptian history stand out pre-eminently as those of great architectural activity. First, the period of what is known as Manetho's fourth dynasty, when the great Pyramids were erected, probably about 3500 to 3000 B.C.; second, the period of the twelfth dynasty, to which belong the tombs at Beni-Hassan; third, the period when Thebes was at the zenith of its power, as shown by the ruins at Luxor and Karnak; and, fourth, the period of the Ptolemies, when the temples at Denderah, Edfou and Philoe were built. I do not propose to inflict upon you any of the theories as to the mythical, mysterious meaning of the Pyramids, because I do not believe in them, but at the risk of telling a thrice-told tale I must draw your attention to some of the principal points of interest in the construction of these gigantic monuments.

The Great Pyramid of Cheops

or Surphis has a base approximately square, the sides being all within a few inches of 760ft. long; the height is 484ft., and it covers an area of 577,600 sq. ft. It was built of limestone, the external casing and the lining of the internal passages and chambers being of granite. It is in the construction of the sepulchral chamber, and the approaches to it that the skill of the builders is most evident. The entrance was on the north face, at a height of 47ft. above the base, from which point a passage about 300ft. long slopes downward at an angle of about 26½ degs. to a chamber cut in the rock 90ft. below the base of the Pyramid. This chamber was not the place of sepulture, but at about 85ft. from the entrance another gallery starts upwards, runs for about 135ft., and then bifurcates, one passage running horizontally to a small chamber known as the Queen's room, and the other continuing upward for another 150ft., where in the heart of the Pyramid is the king's tomb 135ft. perpendicularly above the base. The superincumbent weight above the gallery and the tomb was of course enormous, and the most scientific precautions were taken to prevent these being crushed in.

The great aim of the Egyptian kings was for their bodies to lie undisturbed for 3,000 years, and recent explorations have shown what precautions were taken to prevent their tomb from being approached. The probability is that after depositing the embalmed body in the chamber prepared for it, the workmen blocked up the passage with huge blocks of granite, and then made their way down a small well-hole to the first mentioned passage, and thence to the outer air.

Wooden Construction Imitated in Stone Buildings.

In some of the private tombs near the pyramids are found very interesting examples of the exact imitation of wooden construction in stone buildings, the carving being an exact representation of wooden beams, posts, lintels, &c.

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* A paper read at the Carpenters' Hall on March 7th, 1901.

In these early examples we find no properly architectural forms, but in the rock-cut tombs of Beni-Hassan, 1,800 years older than the earliest known Greek examples, we have columnar architecture fully developed. On the top of the column proper is a small square slab, or abacus, upon which rest the heavy beams carrying the roof, which has a slightly segmental form, and I think there can be no reasonable doubt that we have here the prototype of the Greek Doric order, and there can be equally no doubt that this form of column was imitated from a wooden post.

The columns at Beni-Hassan are 3ft. 4in. in diameter, and 16ft. 8½in. high, and they have sixteen faces, of which fifteen are fluted and the sixteenth left square for the introduction of hieroglyphics. But, more than this, I believe we have also in these rock-cut tombs the embryo of the perfected Greek temple. The history of the evolution of architectural forms and features has yet to be fully written, but we can scarcely hesitate to take the old Egyptian temple as the early form of the Greek one, knowing as we do the immense influence which Egyptian art and civilisation had on Greece? This is more than ever apparent at a later period, when we find the small temples called Typhonia or Mammisi exhibiting a complete peristylar form.

Karnak.

I must not omit to say a word of the wonderful temple at Karnak, where is the Hypostyle Hall, 334ft. by 167ft., the roof being carried on 134 columns, the centre row being higher than the others, forming a sort of clearstory.

This huge hall, it must be remembered, was only a small part of the whole temple, which, with its entrance court and smaller halls, covered altogether an area of nearly 418,000 sq. ft. Various forms of capitals were used in the early periods, imitations of plants being mainly adopted, such as the lotus bud and the palm leaf, the latter having a particularly graceful outline, and occasionally, at a later date, the capital would be carved into a representation of the head of Isis.

One particular feature of the Egyptian temple is that the walls are not perpendicular, but slope inwards from the base, and it is very probable that their shape is a relic of the time when the tent was the chief abode. The only ornaments used other than painting, which was employed universally, was a bead at the angles, and a sort of cornice formed of a large cavetto with a fillet at the top.

It is only a short time ago since the news came that the large columns of this temple of Karnak are being reinstated. Twenty-seven had fallen, eleven of them only about eighteen months ago. Some of the blocks of stone which form portions of these columns weigh as much as 50 tons, and, curiously enough, precisely the same means are now being employed to take down and re-erect these huge masses of stone as were probably used in their first raising, viz., a long inclined plane.

The main dominating idea of the Egyptian was to build for Eternity, and the stupendous massiveness and solidity of his works chiefly attract one's admiration. But this solidity and massiveness were relieved by the most elaborate and varied system of colouring, and it is almost impossible to conceive of the effect of these enormous temples, the columns and walls of which were all richly painted with figure and flower subject and various geometric patterns. In order to obtain a smooth surface for the application of the colour decoration, Sir Gardiner Wilkinson says distinctly that the Egyptians used to coat their columns even of granite with stucco or plaster. These majestic temples were generally approached by long avenues lined with Colossi or Sphirexes, and at its best period Egyptian sculpture was, in its fidelity to Nature, almost equal to that of the Greeks. In clearing out a deep well near the Pyramids nine statues of Chefren, the builder of the second pyramid, were found, and of one of these the late Sir Richard Owen wrote as follows: "The trunk in anatomical truth is equal to the work of Michael Angelo."

Although not to be compared with the great temple at Karnak, the buildings of the fourth period under the Ptolemies are of considerable interest; but as the influence of Greek art had by this time made itself felt, we can hardly look upon these edifices as strictly coming within the scope of this paper.

Many and interesting have been the discussions as to

The Origin of the Arch

in construction, and the probability is that we shall never know the earliest instance of its use, but all the more recent discoveries point to a far earlier date than was at one time credited for it. The instances are numerous in some very ancient buildings where an arched form of spanning was obtained by projecting horizontal courses of masonry, and then cutting the underside of each course into a concave shape. The Treasury of Atreus at Mycenæ is a well-known example of this, and there is a tomb at Assasseef, in Egypt, where the same kind of construction is found; but Prof. Hayter Lewis assures us that in a tomb at Gizeh, which is almost certainly as old as the fourth dynasty, *i.e.*, about 3000 B.C., he himself found the stones of a flattish arch spanning an opening each of which was cut as voussoirs on lines corresponding with the radius of the curve. Lipsius gives several drawings of brick arches, but without dates, so that there can be no doubt that this form was used by the Egyptians; and it has been a matter of some surprise that the trabeated form alone is met with in the larger monuments which have come down to our own time.

But the fact is that the profound scientific knowledge of building which the Egyptians possessed prevented their using a method of construction which was liable to fail in buildings destined, as they hoped, to last for eternity. And from this point of view they were undoubtedly right. If you get your points of support numerous enough and your horizontal beams massive enough, there is far less risk of failure when all the pressures are vertical than when you have to calculate for oblique thrusts, as in the case of the arch, which threaten to push out the abutments as soon as any weight is placed on the apex.

It has been conjectured that these temples were exceedingly dark and gloomy, and certainly the number of columns must have caused very heavy shadows to be cast, but it is certain that so much labour and pains would not have been expended on the ornamentation of the walls and of the columns themselves had there not been ample means of lighting the interior; and, in fact, the way in which this was done is now pretty well established. In one of the later and smaller temples, that of Isis at Philœ, one may see the small slits close to the top of the wall, and the very deep splay on the inside would allow a flood of light to pour down; in fact, the whole of the wall opposite the opening would be illuminated. I ought not to omit to mention the very curious

Rock-cut Temples,

many of which are found, the most extensive and interesting being at Abou Simbil, in Nubia, built by Rameses II. about 1320 B.C. This temple was adorned at the entrance with four majestic colossal figures of the king, two on each side, in a sitting posture. A narrow passage about 18ft. long leads to a large hall 56ft. long by 52ft. broad, at the end of which a short passage leads into a second hall, beyond which again are smaller chambers. But the curious thing is that on the two sides of the large hall are no less than eight irregularly placed chambers, varying in size from about 48ft. by 13ft. to 13ft. by 10ft. It is possible that these chambers may have been intended to serve as tombs for members of the king's family. These chambers are covered with figure paintings and scenes of all kinds, showing the daily life of those who, as Horace Smith says,

> "Had walked about (how strange the story!)
> In Thebes' streets, three thousand years ago,
> When the Memnonium was in all its glory,
> And Time had not commenced to overthrow
> These temples, palaces and piles stupendous,
> Of which the very ruins are tremendous."

Crossing from Africa into Asia, we find a different race of men, different materials and different methods of building. The probability is that the valleys of the Tigris and the Euphrates were peopled at as early a date as that of the Nile, but no building stone being at hand, we have no remains at all approaching in antiquity those of Egypt The soil being chiefly of clay, sun-dried and burnt bricks formed the staple building material, and with these the enormous Ninevite and Babylonish palaces were constructed. The sun-dried bricks soon became friable, and it is owing to this fact that until comparatively recently, there was nothing but vague tradition to fix the site of many of the most wonderful buildings of antiquity, the ruins appearing to the passing traveller mere heaps of rubbish. But it is to the apparently valueless character of these heaps of rubbish that we owe some of the most interesting discoveries of recent years. It is only within the last half century that we have obtained any reliable information as to the early Asiatic nations and their methods of building, and all the remains of the earlier dynasties are in a terribly ruinous state.

The Chaldæans

are the earliest people who dwelt in this part of the continent, and much of their history is mythical; but as far as can be ascertained from those most competent to form an opinion, there existed a Chaldæan dynasty in the neighbourhood of Babylon from about 2200 B.C. to 1500 B.C., although tradition would attribute a far earlier date to this people. It is very difficult to attempt a restoration of an early Chaldæan temple from the data which we have, but Mr. Ferguson, who had a perfect genius for this kind of study, has attempted it. The Chaldæans were planet-worshippers, and one curious feature of their temples was that they were several storeys in height, the different storeys being placed unsymmetrically, such as the celebrated Birs Nimroud, first described by Rich, and afterwards more fully by Sir Henry Rawlinson. It is highly probable that some such building as this gave rise to the legendary story of the Tower of Babel. Each stage was differently coloured, and dedicated to the seven heavenly spheres. The magnificence of Babylon, her palaces, her hanging gardens and her general luxury have been alluded to so frequently by early Jewish and Greek writers that they have become almost proverbial, but, unfortunately, we can only say of all this, "perierunt etiam ruinæ."

Of the subsequent Ninevite kingdom, however, we fortunately have a very extensive knowledge, thanks to the explorations which have been made during the last half century by Rawlinson, Loftus and Taylor, Layard, Botta and Place. This dynasty lasted from about 1250 B.C. to 625 B.C, when Nineveh was destroyed. No less than seven palaces of the kings of this period have been unearthed, and it is in consequence of the fact of the interior walls being wainscoted with alabaster slabs, upon which were delineated all the exploits of the kings, that we have a complete history of their doings in the same way that the hieroglyphics of Egypt have laid bare their life for us. The earliest of these palaces which have been excavated is one at Nimroud, built about 880 B.C. by Ashur-Bani-Pal, and explored by Sir Henry Layard. The palace formed approximately a square measuring about 330ft. each way, and contained at least six large halls, the largest being 152ft. by 32ft., grouped unsymmetrically round a central court, all the apartments being lined with sculptured slabs of alabaster.

The Palace of Khorsabad.

More recently, however, Messrs. Botta and Place have exhumed a far more complete palace at Khorsabad, formerly called Hisir-Sargon situated about 15 miles from the Tigris, where King Sargon built his country palace about the year 721 B.C. This was probably inferior in size and magnificence to the palaces of Nineveh itself, but it is a most extraordinary pile raised on a mound whose dimensions were about 1,030ft. by 1,120ft., and by far the greater portion of this immense area was covered with buildings. The portals of the palace were approached by a grand double flight of steps, but there was also a slope giving access for vehicles and mounted visitors. The Great Gate gave access to an outer court, round which were grouped stables and out-houses and metal stores. To the north-west of this large court was the residential portion of the palace. and beyond this the state apartments. To the south-west of the Great Court was the harem, and near it the observatory, and closely adjoining the private apartments was the temple.

The discoveries made by Mr. Place were of the most unexpected nature. The entrances to the various courts were magnificent arched gateways of bricks, the voussoirs being carefully moulded to the proper shape and enamelled in various tints, forming a most beautiful pattern, the colours being as vivid as if they had been only lately taken from the kiln. Artificially-burnt bricks were found used for paving, so hard that they rang like a bell; arched covers for sewers and conduits formed of most accurately-moulded radiating bricks, and glazed wall tiles in profusion. The state rooms were all faced with engraved alabaster slabs up to a certain height, and above this colour decoration was used. In the harem the walls were lined with encaustic tiles, with all kinds of figured subjects enamelled in different colours.

Authorities' Opinions on Lighting.

One very interesting and much debated question is as to the method of lighting and roofing these large halls. Mons. Place believes they were vaulted, and he attempts a restoration of the rooms on this basis, which I am bound to say does not recommend itself to my mind, as the effect is very heavy and the lighting could only have been by bull's eyes in the vault. Ferguson, on the other hand, believes—and he has the analogy of existing houses in the country to support his view—that the roof was formed of horizontal beams supported on intermediate wooden columns with moulded caps, the whole covered with dried clay or mud; and he thinks that as the walls were very thick, dwarf columns were placed on them at intervals, and that curtains, or screens, were arranged for shutting out the weather. There are, however, very grave difficulties in the way of accepting this theory. As the first thing which the Assyrian builders did was to raise a large mound of clay, it would be almost impossible to place comparatively small columns on this without any kind of brick pier or foundation under them, and yet in all the palaces that have been examined there has never been found the slightest trace of any such foundation in the internal space between the walls. The wooden columns may very well have perished, but surely some trace of piers would have been found. Moreover, with all the upper portion of the walls open, the draught would have been very great, and there would have been no privacy.

The excessive thickness of the walls would almost suggest some system of vaulting, and one of the French explorers believes he found traces of some sort of lunettes at the springing of the vaults just above the wall line. Sculptors tell us that all the Assyrian wall decorations are arranged so as to be perfectly lit by openings just above the top of the walls, but exactly how this was done will always be a problem wherewith to vex the mind and tax the ingenuity of the antiquarian. Although we have no details of the columns, yet from the small sculptured ornaments on the walls we are able to form a fairly accurate notion of the kind of work which was in vogue, and one of these representations shows what we know as the Ionic volute so unmistakably that we can scarcely doubt that its origin lies with the Assyrian builders, and there can also be little doubt that the carved heads of animals as we find them at Persepolis were also used as caps. It is quite evident that colour was largely used, and that much of the effect of these palaces was due to it; but when compared with the strength and massiveness of the Egyptian buildings, Assyrian architecture must take a very inferior place. We must, however, never forget that they were without any good building stone.

The Persian Builders.

The third great building nation of antiquity were the Persians, who appear to have gained the supremacy in Central Asia about the middle of the sixth century B.C. under Cyrus, and to have retained it until their overthrow by Alexander the Great. There was one province of the Assyrian Empire which became an independent kingdom, viz., Lydia, which has an interest for us historically, though not architecturally, as after it became an independent monarchy under Gyges to the time of Crœsus it was brought very closely into contact with the Greeks of Ionia. It was the Lydian monarchy which was first attacked by the hardy Persian mountaineers under Cyrus, who took Sardis and soon reduced the Asiatic Greeks to a state of tribute. His son Cambyses conquered Egypt, and there can be little doubt that the sight of the magnificent stone buildings in that country fired the monarch's ardour to try and compete with them, and exercised considerable influence on the subsequent architecture of Persia; for before this date there are no ruins where stone had been employed for columns or structural ornament as opposed to surface decoration. Darius gave his attention to consolidating his empire, and commenced the palace at Persepolis which was afterwards largely added to by Xerxes. The grandeur of Persepolis may be gathered from the fact that when it was taken by Alexander, about 330 B.C., the treasure found there was said to have exceeded 120,000 talents, in value equal to about thirty millions sterling.

Persepolitan Palaces

were built on a platform of rock varying in height from 14ft. to 40ft. above the plain, from which they were approached by splendid flights of stairs of very easy rise, and the palaces themselves were raised still higher on elevated terraces. In the ascent from the plain to the northern platform the stairs are 22ft. wide, with treads 15in. wide and risers 3½in. high, and they can be ascended on horseback. The entrances were adorned with human-headed bulls, and the roof was carried by four columns, so that we may call it a distyle hall. On the right of this is the Chehil Minar, the magnificent hexastyle hall of Xerxes, with similar porticos on three sides of it. The bases of all the seventy-two columns have been found *in situ*, so that the plan of the hall is beyond dispute, but there is a difference of opinion as to how the angles were filled up, the probability being that small rooms were constructed here. One of the early explorers found some pipes evidently leading to a drain, and he jumped to the conclusion that no wall could have existed here; and, in fact, Mons. Chipiez has boldly published a restoration of this building without any walls at all, and he professes his belief that there never were any, and that the building was simply a kind of open durbar hall for state occasions, when the monarch could be seen by all those who attended.

No one, however, who has actually inspected the remains has come to this conclusion, and further research shows that the pipes turned off with bends much in the way that our own rain-water pipes would do if they came down the face of a building, and the drain was discovered quite clear of the foundations of the wall.' Furthermore, a little to the right of this huge palace is the smaller one, tetrastyle on plan, built by Darius, and here portions of the wall are still in existence, so that the balance of evidence is against the hall of Xerxes having been entirely open. Still further to the right is a large building, proved by inscriptions to have been erected by Xerxes. This is hexastyle; and here again portions of the walls remain. Ruins of other buildings—including one large dekastyle hall called the Hall of the Hundred Columns, which has been explored by Stolze, and also by Dieulafoy—exist on the terrace, and it is very probable that some of these were never finished, as it has been well said that an Oriental potentate would far rather begin a palace of his own than finish one begun by his predecessor.

The Small Palace of Darius

is specially interesting from the fact that the same king had a tomb for himself cut in the rock about eight miles from Persepolis, on the other side of the river, and he made the entrance to it an almost exact copy of the façade of his palace; and from this we are enabled to gain a very good idea of what the latter was like.

The material used was a fine dark-grey marble, which was obtained in very large blocks, columns 60ft. high being in two, or at most three, segments. It is almost certain, however, that this stone was only used in the walls for the door and window jambs, the main body of the wall being constructed of crude brick, and faced with enamelled or glazed bricks and tiles. The taller of the large columns of the Chehil Minar is 67ft. 4in. from the floor level to the back of the bull's neck. Beams were placed between the bulls' heads, supporting the flat roof, which was of timber and covered with clay. The other column has a capital of great height, probably imitated from Assyrian forms, with curious volutes placed vertically instead of horizontally, and above these were brackets under the beams.

The columns were always fluted, and there is this difference between the Persian and the Egyptian or Grecian columns, that the former have many more flutings than the others—forty, forty-eight and fifty-two flutes are found in the Persepolitan columns, whereas in Egypt there were never more than sixteen, nor more than twenty-four in Greece. The intercolumniations also are always much wider than in the Greek examples. I may mention that the columns of the Parthenon were only 34ft. in height; and this will give some notion of the magnificence of Xerxes's splendid hall.

I would specially call your attention to the base of these columns, which appears to me to combine simplicity, gracefulness and correct construction in a very remarkable way, and it is curious that the Greeks seem never to have adopted this form of base, although one very similar has been found in some excavations at Rome. An ornamented Persepolitan base would be a very effective addition to the Corinthian or Composite orders. The Persian kings had other palaces at Ecbatana and Susa, the latter of which has been explored by Mons. and Madame Dieulafoy, and some very interesting discoveries of wall decoration were made. No mention of Persian architecture would be complete without a reference to the ruins of some

Remarkable Buildings in the Province of Fars,

which have afforded a very fertile field for discussions and differences of opinion among archæologists. Nearly all the buildings which I have described are in the trabeated style, but at Feruz-Abad and Sarvistan are the remains of a very different kind of building. It was first described by Flandon and Coste, and has more recently been visited by Mons. Dieulafoy. This is an isolated building about 135ft. 6in. long and 118ft. broad. The main entrance is in the west front, where is a lofty vaulted gateway 47ft. wide and 19ft. deep, with two small gateways on each side, the wall spaces between and on each side of the gateway being enriched with engaged columns of about 27in. diameter, with neither caps nor bases. On the north side there is another deep vaulted gateway giving access to a hall with two ranges of short thick-set columns. In the interior is a court nearly 42ft. square, with a lofty ovoid dome over it, and on the south there is another pillared hall with a smaller domed apartment. The domes and vaults are of well-baked brick, the corner walls are cased with stone, and the columns are of stone plastered over. Now it is extremely probable that these, and similar buildings, were the precursors of the later mosques, but what is their date? Mons. Dieulafoy considers that they have affinities with such buildings as at Khorsabad, with its vaulted gateways, and puts them as co-eval with the Persepolitan buildings, about 450 B.C., and if this could be proved it would be another instance of the very early date of arched forms. But the more generally recognised view is that they belong to a much later period, either to the time of the Arsacid dynasty, or possibly as late as the Sassanid. At any rate, they are worthy of a passing notice, situated as they are in the heart of the desert, and their history will probably never be elucidated.

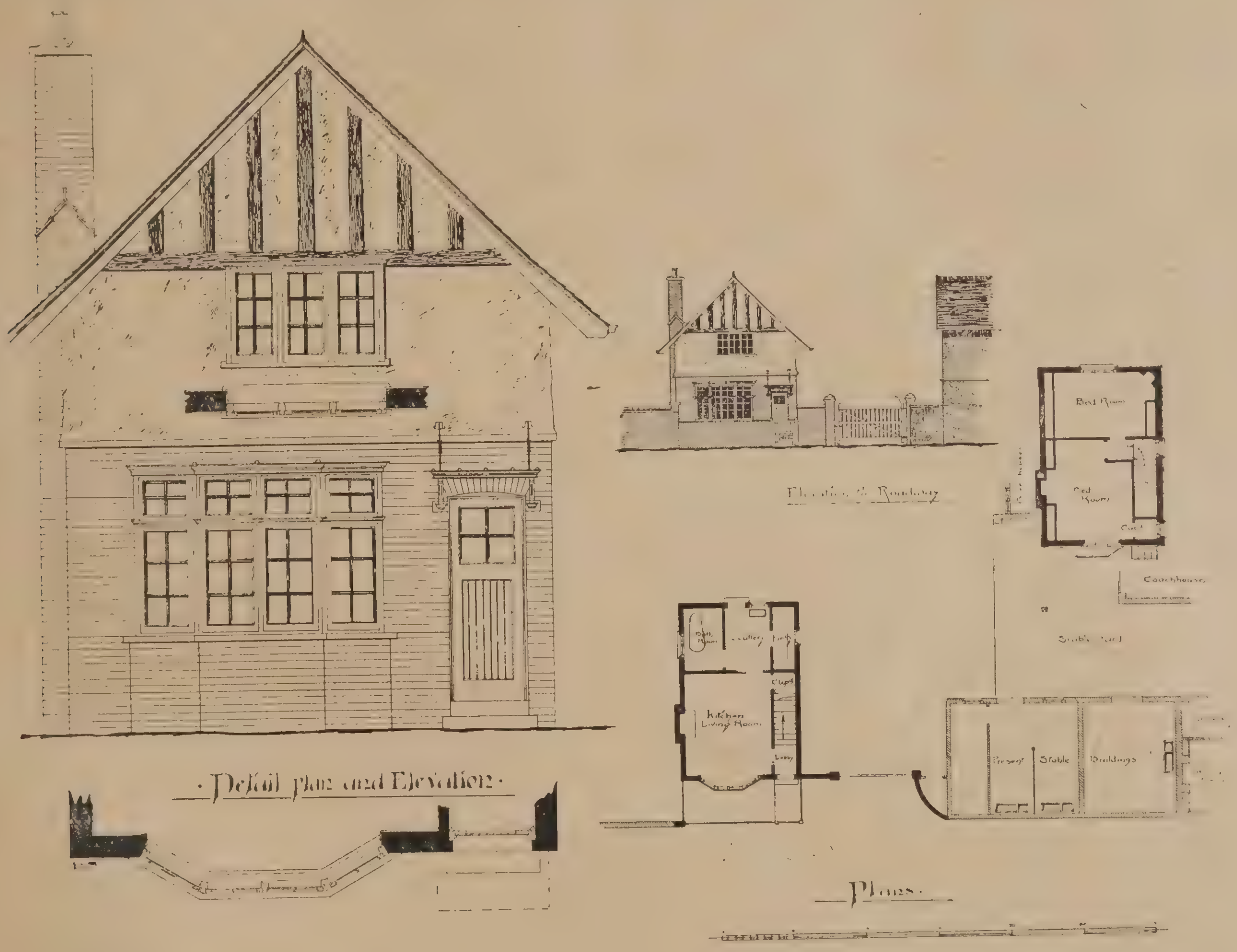
Greek and Persian Art.

There is one very curious point, that must strike every student of ancient art in connection with Persian architecture, which attained its highest perfection between about 500 B.C. and 450 B.C. Now, about 598 B.C. were commenced the Temple of Diana at Ephesus and the Temple of Juno at Samos; later in the same century the Temple of Olympian Zeus at Athens was built, the Temple of Panhellenic Zeus at Egina towards the end of the century, and the Parthenon, the crowning glory of Greek architecture, was built in 438 B.C. Herodotus tells us that the ships of Darius and Xerxes swept the Ægean, Greek mercenaries entered the armies of the great king, envoys from various Greek states, political refugees like Demaratus and Themistocles, doctors like Ktesias, and others—all formed part of the court of the Persian monarchs; and, in fact, the relations between Greece and Persia were very extensive. How is it, then, that so little Greek influence is manifest in these Persian buildings? The answer is that the two nations were in their politics, their religion and their art utterly dissimilar; that Persia was in all essentials an Asiatic power, and allied to the older Assyrian civilisation; and that her art was modelled on its lines. After the Macedonian conquest we find the Hellenic genius asserting itself all over Asia in the wake of Alexander the Great, when architects from Greece were largely employed by the Asiatic satraps.

Explorations in Phrygia.

It must not be imagined that the three great monarchies which we have been considering were the only ones in the ancient world where a high standard of art prevailed. Many brave men lived before Agamemnon, as Horace tells us, whose names have perished because no inspired bard has sung their exploits; and scattered over the eastern world are the ruins of cities which we know to have existed, but which had been absolutely forgotten and their sites lost 1,800 years ago, when Strabo wrote; and in many cases the districts in which these cities were are now so far removed from the track of civilisation that they are rarely visited. Ancient Phrygia, for instance—the history of which is almost entirely legendary—has recently opened up for us some secrets of her long-forgotten past, thanks to the enterprise of the Society for the Promotion of Hellenic Studies. From these Phrygian explorations some further interesting examples of the imitation of wooden forms in stone have been discovered. In one case is a representation carved in the rock of one of our commonest wooden forms of roof. The upper part of this chamber was carried by two piers cut out of the rock and formed into columns, one of which has been knocked down, but the other is standing and is decorated at the top with an ornament which can scarcely be called a cap, as it is only carved on one side, which was subsequently largely used in Greek architecture. This ornament is distinctly unsuited to a column, but it is applicable to a pilaster, and must have been imitated by a mason who had seen the ornament in a different position. Curiously enough, on a stele discovered by Mons. Place at Khorsabad almost an exactly similar ornament was found.

It is a curious circumstance that although Indian traditions go back to as remote a date as 3100 B.C. no remains exist of any stone buildings earlier than the time of King Asoka, who reigned between 272 B.C. and 236 B.C. Previously to that timber must have been almost exclusively used, and wooden forms have left their print on much of the native Indian architecture to the present day. We know that Alexander's conquests extended into India, and it would not be surprising to find traces of Persian art in some of the Indian buildings; in fact, at Cabul is a pillar so strongly resembling the Persepolitan column in its upper members that it must be a copy probably made from memory, and doubtless many other such might be found. But I have no time left to indulge in a hunt after these sporadic reminders of the architecture of the ancient world, nor to touch upon the wonderful buildings of Cambodia or the relics of ancient civilisations which have been found in the heart of the American continent. Although explorers have unearthed for us many valuable remains, it must be perfectly certain that there still remain buried—sometimes beneath the sand of the desert, sometimes under the waves of the encroaching sea, and sometimes under the accumulated débris of centuries, upon which other modern buildings have been erected—relics of antiquity which far transcend any that have been discovered. In many places tradition lingers long, and in the course of years enhances and exaggerates, but there is generally a solid substratum of truth at the bottom of it, and we may yet live to see many more of these celebrated ancient buildings disclose to us the secret of their fame. In other places tradition completely dies out, and it is only chance that leads to most valuable discoveries. Quite recently we have heard of most wonderful discoveries in the island of Crete, where explorations are being systematically carried on with the most unexpected results. At Knossos the palace and throne of King Minos, who was considered to be almost a legendary monarch, have been unearthed, and the interest of these discoveries will probably be greater even than those of Dr. Schlieman at Troy and Mycenæ. The very earliest beginnings of Greek architecture are here revealed, and its further affinities with Egypt are made clear. As the world shrinks and its by-ways become opened up we are continually finding unexpected remains of building nations—even in Mashonaland such have been only recently discovered—but the builders have entirely disappeared. It is not too much to say that wherever over the whole face of the earth explorers have come upon the relics, in stone or brick, of a remote civilisation, their wonder has been excited at the solidity, and in many cases the high artistic quality, of the work; and it appears to me, despite all our modern resources and all the discoveries of science in these latter days that no one can study such buildings as I have brought to your notice this evening without having a little of his modern conceit taken out of him, for truly do the remains testify that in energy, in intelligence and in skill there must have been giants in those days.



COACHMAN'S COTTAGE, "BLEAK HOUSE," PATRINGTON, NEAR HULL. ALBERT C. FREEMAN, ARCHITECT.

A COACHMAN'S COTTAGE.

THE addition of a coachman's cottage (illustrated on this page) to "Bleak House," Patrington, near Hull, is for Dr. W. H. Coates, M.D. It is proposed to be faced with red facing bricks, with rough-cast plasterwork to the first-floor external walls, and half timber work and barge boards to the gables. The roof is to be covered with red tiles. The design is by Mr. Albert C. Freeman, architect, of London, who carried out the library and other additions to the house some time ago.

New Mission Premises for the Barbican Mission to the Jews have been erected in the Whitechapel Road as a memorial to the late Prebendary Gordon Calthrop, vicar of St. Augustine's, Highbury, and first president of the mission. The total cost of the building, including purchase of the site, furnishing, &c., has been about £8,700.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Apportioned Cost of Repairs to Adjoining Drains.

LONDON, E.C.—ARCHITECT writes: "On p. 287 of your issue for May 15th, under the heading 'Apportioned Cost of Repairs to Adjoining Drains,' your expert says, in answer to 'A.H.': 'If the drain in question is a "combined private drain," and not a "sewer" vested in the local sanitary authority, then the cost of reconstructing or repairing the combined drain should be kept quite distinct from other work, and divided equally between the owners of the two houses draining into it.' Under what Act of Parliament, or under what decision in a court of law, is this question decided?"

The reply referred to is given as constituting a reasonable basis for the amicable and equitable division of the expense of reconstructing a combined private drain amongst the property owners concerned, and is in accordance with the general principle set forth in the Public Health (Amendment) Act of 1890. Under section 19 of this Act it is laid down that "where two or more houses belonging to different owners are connected with a public sewer by a single private drain, an application may be made under section 41 of the Public Health Act, 1875 (relating to complaints as to nuisances from drains), and the council may recover any expenses incurred by them in executing any works under the powers conferred on them by that section by the owners of the houses in such shares and proportions as shall be settled by the surveyor or (in case of dispute) by a court of summary jurisdiction." The legal powers conferred on sanitary authorities within the metropolis when dealing with combined private drains will be found in the Metropolis Local Management Act, 1855, the Metropolis Local Management (Amendment) Act, 1862, &c. In all cases of reconstruction of combined private drains it is most desirable that the property owners concerned should mutually agree to pay their fair share of the cost. If any such friendly arrangement is impossible, and the necessary reconstruction required by the local authority is allowed to go by default, then the local authority will execute the necessary works, and charge or apportion the cost as may be considered necessary, according to the particular circumstances affecting the case and locality.

T. E. C.

Powers of County Court Judge respecting an Arbitrator's Award.

PETERBOROUGH.—M. H. writes: "Some time ago a report was given in your columns of an important case relative to architects as arbitrators. An arbitrator having issued his award, what are the powers of a county court judge in respect to it?"

The case you quote (see p. 79 of the BUILDERS' JOURNAL for March 6th last) came to this. The architect certified that a certain sum was due from the building owner to the contractor. The contract provided that this certificate should be conclusive evidence of the work "having been duly completed, and that the contractor was entitled to receive payment of the final balance." The building owner alleged that the architect had measured up the work negligently, and had made him pay too much, and claimed damages. The Court of Appeal, however, held that inasmuch as the architect had really been an arbitrator between the parties, he could not be made liable for negligence. This decision does not affect the powers of the county court judge with reference to the certificate. By the clause quoted, the contractor could sue under his contract.

A. O. H.

Boiler Chimney-shaft.

NIMAJNEB writes: "I am building a boiler chimney-shaft, and propose to line it with firebrick 4½in. thick to a height of about 25ft. The shaft is octagonal, and measures 2ft. 6in. in the clear inside of lining. Between the latter and the main walls of the shaft I have a ventilated cavity. Should the firebrick lining be tied or bonded in any way to the main walls by ties bridging over the cavity? The object of a cavity is, I presume, to allow expansion, &c. If the lining be tied or bonded at all to the main walls, would not the object of the cavity be defeated and cracks occur where the bonding was? If not bonded to main walls, is there any danger of the lining collapsing? If lining should be secured to the main walls, what is the best form of tie or bonding under the circumstances—iron or firebrick?"

The firebrick lining should not be tied or bonded to the main walls, the object being to allow free expansion. Twenty feet is generally considered high enough for a half-brick firebrick lining for a boiler shaft. A sailing course should project immediately over the cavity from inside of shaft, to prevent dust and soot falling between and blocking it so as to prevent expansion. The cavity does not require to be ventilated; any opening made into it would spoil the draught.

HENRY ADAMS.

Sketching at Beverley.

DUNFERMLINE.—SKETCHER writes: "I propose going for a fortnight's holiday to Beverley, Yorkshire. Kindly mention one or two places of architectural interest in the neighbourhood?"

In Beverley itself there is plenty of interest, both in the Minster and the church of St. Mary; but although it is generally difficult to make a mistake in Yorkshire, there seems to be little of value that is easily reached by rail from Beverley, except Headon Church, near Hull, with its pure Early English north transept and its early Perpendicular central tower. It would be quite possible, however, to work round from Hull to Howden, and thence on to Selby and York, in all of which places there is ample material for study.

G. A. T. M.

Shivers.

NEWCASTLE-ON-TYNE.—G. C. writes: "In the recent South Kensington examination in building construction a question was asked, What is a shiner? What is this?"

Apparently this is a misprint for "shiver"—a spall, or small splinter.

Liability for the Non-Fulfilment of Contract.

PERPLEXED writes: "The answer to my question on p. 286 of your issue for May 15th is rather disappointing. I wish to know whether there are any legal decisions bearing upon the question. If so, kindly quote them."

Matters of this kind depend so largely upon the *exact* wording of the contract both between architect and employer, and employer and builder, and the conditions, that only general answers can be given together, with the advice that a local solicitor should be consulted. We know of no decided case upon the precise point raised.

G. A. T. M.

Damage due to Water Leakage.

WOODHOUSE.—MASON writes: "I live in my own house. The next-door sink is at the other side of a partition between the two houses. There is a leakage of water, and it oozes through the wall, destroying my paper. The landlord has had a man to look at it, but the nuisance continues. What is the best action to adopt?"

Write or interview the owner of the adjoining house, requesting him in a friendly manner to effectually repair the defective water-pipe and make good the damage caused to your property. If you are unable to obtain a satisfactory settlement in this way, consult a local solicitor of good standing.

T. E. C.

By-laws relating to Chimney Openings.

PETERSFIELD.—H. T. K. writes: "(1) Model By-law 42 requires the back of a kitchen chimney opening in a party wall to be at least 9in. thick to the height of at least 6ft. above such chimney opening, and such thickness to be continued at the back of the flue. Does this mean the whole height of the flue, or only to the height of 6ft. above the opening? (2) The by-law further provides that the back of every other chimney opening not being in an external wall shall be 9in. thick from the hearth up to the height of 12in. above such opening. Does this mean that the flue above this specified height may have a backing of 4½in. only, even if in a party wall, as seemingly implied by the previous by-law?"

In questions of this description it is desirable to quote the entire section of the by-law, and not incomplete or detached portions, as such extracts may be entirely contradictory when separated from the context. (1) The back of the flue of a kitchen chimney constructed in a party wall should not be less than 9in. thick for the whole of the height in which such flue is built in connection with the party wall. (2) Under this by-law the back of every other chimney opening and flue (not being in an external wall) must be 9in. thick up to a height of 12in. above the chimney opening. The remainder of the flue may be 4½in. thick unless prohibited by any other section or by-law.

T. E. C.

Engineering Notes.

London Tramways Extensions.—The Select Committee of the House of Commons have declared to be proved the preamble of the Bill of the London County Council seeking powers to construct numerous junction lines of tramway and several new tramways, principally in the south of London, the whole of the proposed lines, together with the existing systems, to be worked by electricity, except so much as refers to the Farringdon Road extension and the York Road, Lambeth, tramways, which are thus rejected.

The Tunnel to the Isle of Wight.—Messrs. P. W. and C. S. Meik, the engineers entrusted with the building of the tunnel to connect England with the Isle of Wight, hope to begin operations in September. It is more than likely that the trains will be propelled by electric motors, making it the only tunnel of the kind in the kingdom. The total length of the new line will be eight miles, but that of the tunnel proper will be no more than two miles and a quarter. Of the estimated cost of £550,000 as much as £400,000 will be spent on boring under the Solent. When the project is completed passengers will be carried from London to the Isle of Wight in the record time of two hours and a half.

Mr. Henry Brunton, M.I.C.E., whose death occurred recently, held a remarkable place in the history of the international relations between Japan and this country. The treaty negotiated by Lord Elgin with Japan stipulated that the coast should be lighted and buoyed for the safety of general navigation. When Sir Harry Parkes drew the attention of the Japanese Government, in 1868, to this clause, which had not been fulfilled, he was informed that they were perfectly willing to carry out their obligations, but their ignorance and inexperience made them unable to fulfil them without further advice. Finally, Mr. Brunton was selected to aid them, on the advice of Messrs. Stevenson, of the Scotch Lighthouse Board. On his arrival in Japan he found that the work before him was not so simple as building lighthouses in his native country. Sir Harry Parkes persuaded the English admiral then in China to let him have the use of the despatch steamer "Manila," and in that Mr. Brunton and his staff made a tour round the coasts of Japan, visiting some twenty sites and making the necessary surveys and calculations. In ten years' time he had built fifty lighthouses, and had arranged a complete Government department for their maintenance. He further reported on, and made the plans for, the removal of the bars at the mouth of the rivers, on which the Government officials are even yet working. His design for the harbour in Yokohama Bay was thought too expensive by the Government at the time, but that subsequently adopted was on his lines. He also started the telegraph system in Japan, and introduced methods of constructing bridges, buildings, &c., to withstand earthquake shocks. On the completion of his lighthouse work he returned to this country.

THE RISE AND DEVELOPMENT OF EGYPTIAN ART.*

By Professor FLINDERS PETRIE.

WHEN a summary of what was known on early art in Egypt was read by me here eight years ago, I had to say that not a single sculpture was dated before the fourth dynasty, and that the rise and course of this art were still buried. But every year since then has yielded some portion of the early art, until now we can trace it from the very beginning.

Our first view of any civilisation in Egypt starts with the beginning of cultivable land, on the first deposits of Nile soil, about 7000 B.C. Before that Egypt was only a rocky gorge frequented by wild animals and palæolithic hunters. The oldest graves that are known are of a settled pastoral people, and show that pottery and small quantities of copper were already possessed by the rude inhabitants. But this civilisation rapidly developed in the fertile valley of the Nile, and

The First Steps of Art

are seen in the white clay paintings on the red pottery vases. These paintings are usually figures of goats, but some are known of hippopotami and human figures. This style of pottery painting disappeared in the early part of the prehistoric age, only being found in the first tenth of the known graves.

The carving of slate palettes in animal forms begins at its best in almost the earliest graves, and underwent continued degradation through the whole prehistoric period. The best work on slate was that of the incised lines. The favourite scope for animal figures was in the ivory and bone carvings on the heads of combs. They are, however, but rudely treated, and no fine or spirited work is found among them. The general low level of the figure work among these people co-existed with a very fine taste and skill in purely mechanical outline, as seen in the pottery and stone vases.

Of the latter part of the prehistoric age many examples of drawing remain on the painted pottery; and of the same style, but more varied, are the paintings on a tomb.

Prehistoric and Dynastic Art.

There is a strong contrast between the prehistoric and the dynastic art. The former was, at its best, far inferior to the rough work of the later people; while in mechanical ability the later people show no marked improvement, and in some respects—such as flint work—they never reached the prehistoric level.

The earliest work that may be assigned to the dynastic race is the first statue of the god Min from Koptos, made rather before 5000 B.C. The figure is of the rudest, a long block with legs and arms marked by grooving; yet on the side of it, roughly hammered on the surface, is an excellent head of a stag and two *pteroceras* shells. On another statue of Min which is more elaborated there are several carvings, of which the hyæna chasing a calf is the best, showing a good sense of expression and character.

At Koptos were also found pieces of pottery figures in the round, which explain how the Egyptians attained at once such a fine style in sculpture when they adopted working in stone. The pottery is only of coarse clay, black inside, but a fine face of hæmatite was burnished on the surface, which gave a high finish to the work. Only fragments were found at Koptos, but a noble figure of a lion comes from Hierakonpolis.

From the same site comes our next half-dozen examples of the art shortly before the first dynasty. A great mass of ivory figures have shown what abundance of such work there was in this age, and how complete a mastery of carving had been attained. Beside the good proportions of the figures, we see in the carving of the heads real portraiture, as true to a type as any of later time. In all this work, though traces of archaic style cling to it, yet the power of expression is of the best, as showing character and race.

A rougher kind of work appears in the little glazed pottery figures of animals of the same period, which are interesting as showing the freedom of using glazes at so early a date. Glazed tiles were also made at this time for wall decoration, and continued into the third dynasty. The fine work in hard stones seems to have come to a climax under these earlier kings; as nothing has exceeded in size and work the great syenite bowl from Hierakonpolis.

Carved Slate Palettes.

We now come to the most important of early monuments, the carved slate palettes. And since the discovery of that of Narmer, which is now fixed by his tomb as being just before Mena, we may date all such carving to the pre-Menite kings. The only slate with entirely animal figures was found at Hierakonpolis. The work is of the same stamp as other examples that we have noticed, somewhat archaic but full of vitality and character.

One of the largest slates shows a long procession of warriors bearing different weapons. The style is more flat and cheap in effect, grooved lines being freely used. The scenes have not that directness and unity that we see in the other examples; and altogether, though full of interest in the subjects, it is the poorest of all in the art. The reverse of it is flat. Pieces that belong to one of the finest slates make us greatly regret that no more of it is known. One side shows a beautiful group of two young giraffes and a palm tree. In the sense of artistic grace and design this is the finest piece of such work that is known.

The outline work attained its full growth in the time of Mena, as seen on some of the ivory vases. The figure of a hawk is practically the same as in any later period; the style is complete, and no trace remains of the archaism of the previous reign. The fragment of a bull's head on another ivory vase shows that carving in relief was not quite so far advanced.

The main examples of decoration and technical work of this time are the bracelets of the queen, found so unexpectedly this spring upon her arm. The band of hawks in alternate turquoise and gold is a record of the culmination of the art. This bracelet just embodies the changes of that critical point in the history of the art; a change as rapid and decisive as the change in Greek art, from the pre-Persian to the Phedian sculpture.

In the Reign of Zet.

On coming to the next reign—that of King Zet, the third of the dynasty—the incised carving is seen to have been fully carried out on the stone bowls. The cutting is as flowing on this hard metamorphic slate as on the soft ivory.

The richness of the dynasty seems to have culminated under the fifth king, Den; he was the first king who used stone in his tomb, and he grandly paved the whole of it with slabs of pink and grey granite, a labour no other king attempted to copy for centuries afterwards. He first had a pictorial royal seal showing his herculean labours in wrestling with the hippopotamus, and hooking the crocodile by its jaws. And the only relief inscription on a vase belongs to him, a splendidly cut panel on a large alabaster jar. He was distinctly the magnifico of that age; the work less severe and noble than that of Zet, but more showy and sumptuous.

Furniture Legs.

Throughout the earlier part of the dynasty there was a standard decoration for the legs of stools or other furniture, of carving them in the conventionalised form of bulls' legs. This pattern descended from prehistoric graves, as it is found on a large scale in wood at about four-fifths through the prehistoric age. The work of these bulls' legs is remarkable for the highly conventional decoration of the vein lines; and it might be mistaken for *cinque cento* design rather than credited to the beginning of history.

Lastly, we see here the earliest statue that is yet known, belonging to the middle of the second dynasty, or about 4350 B.C. It is obviously a long way from the archaic style, and we have yet to find a long series of sculpture to lead up to this. The head is highly finished, and more natural in the form of the eye and mouth than any of the crowd of royal statues which filled the succeeding ages.

It is to the temple site of Abydos that we must look for the carvings on slate, and perhaps the royal statues, which will more completely fill our view of the rise of art; and it is that site to which I hope to give the next three years of work in Egypt.

Keystones.

A Stained-Glass Window has been placed in St. Giles's Cathedral, Edinburgh, in memory of Major-General Wauchope.

A New Church in Edinburgh has been erected for the Fountainbridge United Free Church congregation at Murchiston.

A New Pavilion for the Darwen Golf Club was opened recently on the links at Winter Hill. The pavilion, which has cost close upon £300, overlooks the first tee. It is a timber erection with a corrugated iron roof. The pavilion has been erected under the supervision of Mr. G. G. Sames.

A New Church at Smethwick, dedicated to St. Stephen, is about to be erected in the parish of Holy Trinity, at a cost of £4,750, from the design, of Mr. F. T. Beck, architect, of Wolverhampton. The contract for the new church has been secured by Messrs. J. Harley & Sons, of Smethwick.

Changes of Address.—Professor Charles Gourlay, A.R.I.B.A., has removed from 2, Oakvale, Gibson Street to 30, Hamilton Drive, Hillhead, Glasgow. Messrs. Thomas W. Aldwinckle, F.R.I.B.A. & Son have removed their offices from 1, Victoria Street, Westminster, S.W., to 20, Denman Street, London Bridge, S.E.

The New Inghamite Chapel at Cotton Tree, Colne, built by a section of people which split from the Winewall body, was opened recently. The new erection is built of Winewall stone, and consists of an upper hall, which will seat about 400 people, and a large lecture-room on the ground floor. This latter will be used as a Sunday-school until the church has developed. The cost of the new building is estimated at £2,000.

The Edinburgh Architectural Association recently visited Dunfermline, where, through the kindness of Colonel Hunt of Pittencrieff, they were enabled to inspect the old House of Pittencrieff, with its various old articles of furniture, pictures, &c. Mr. John Houston, architect, of Dunfermline, acted as leader, and read descriptive accounts of the house and the picturesque glen in which it stands. The party then drove to Pitfirrane, where they were received by Sir Arthur Halkett, Bart., by whose courtesy the splendid old pile was examined, and who gave a most interesting account of the house, and recalled how it had been inhabited by the Halketts of Pitfirrane since 1437.

A New Infants' School is being erected for the Preston Church Day Schools' Association in Plungington Road. Accommodation is provided for 300 children, and the cost has been about £2,400. The school will contain a schoolroom, 66ft. by 24ft., to accommodate 190, to be divided by movable partitions to form classrooms. There will also be a class-room to hold sixty, and a babies' room for a similar number. Adjoining these will be a mistress's room, spacious cloak and lavatory rooms, &c. The yards are spacious. The materials employed in the building of the school are brick and stone for the outside, the roofs being of open timber. All the rooms will have a glazed brick dado about 4ft. high. The architects are Messrs. Myres, Veevers & Myres, and the contractors Messrs. T. Croft & Sons, of Preston.

Sheffield Society of Architects and Surveyors.—The fourteenth annual report (for the year ending April last) states that the membership now stands at 111, as compared with 109 last year. Reference is made to the objections raised by the sub-committee of the Highway Committee respecting the construction of area lights in footpaths, as reported on p. 217 of our issue for April 24th last. The statement of accounts shows a balance in the bank of £99 4s. 6d. We notice several misprints in the pamphlet—such as "Pryor" for "Prior," "Dauber" for "Dawber," "Bryden" for "Brydon," "Slator" for "Slater," "Baggaley" for "Baggallay," while in one case we read "Berresford Pite" instead of "Beresford Pite." "Palladio Archittura" is also given for Palladio's "Architettura." It is so easy to verify the names that we are surprised to see them misspelt.

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* Extracts from a paper read before the Applied Art Section of the Society of Arts on May 21st last.

A Statue of Queen Victoria is to be erected in Halifax at a cost of about £2,500.

Staincliffe Church has been reopened after re-painting and decorating by Messrs. Powell Bros., of Park Square, Leeds, at a cost of about £207.

New Town Hall for Marylebone.—The Improvements Committee of the Marylebone Borough Council recommend the latter to acquire a site of 28,000 sq. ft. extending from Circus Street to Wyndham Street, Marylebone Road, whereon to erect a town hall which shall comprise a large hall for public meetings, &c.

The Liverpool Diocesan Church House has just been completed. The building occupies a prominent site in one of the main thoroughfares of the city, and, besides a diocesan board-room and well-equipped library, contains accommodation for the various agencies connected with the Church of England in the diocese.

Coldbath Fields Prison, with its huge and gloomy gateway, of which but a vestige remains, will shortly be a thing of the past. The Post Office at Mount Pleasant has taken possession of the "House of Correction," which was opened in 1794, and closed its doors to the guilty public in accordance with the provisions of the Prisons Act of 1877.

The Parish Church of Llanrhidian, Gower, was reopened recently, after restoration. The work of constructing a new roof for the chancel, repairing the ceiling of the nave and renovating the masonry has been accomplished at an expense of £350. The chancel has also been refitted with choir-stalls, communion-table, &c., and stained-glass windows were presented by several donors.

Keppel Street Baptist Chapel will soon be demolished in consequence of the changes which are taking place upon the Duke of Bedford's London estate. It has been found impossible to modify the plans to such an extent as to permit of its retention; but the ground landlord has contributed one hundred guineas towards the provision of a new building elsewhere. Keppel Street Chapel dates from 1795, and it then stood alone in the fields.

A New Kursaal at Southend is being erected in the endeavour to emulate the glories of Blackpool. The kursaal, which has been building for more than two years, is now announced to be opened on the first Monday in July. It has cost £100,000. It includes a shop arcade 120yd. long; a tower, of which only the foundations are yet laid, 530ft. high; a ball-room for 2,000 dancers; a dining hall which will accommodate 1,000 persons; and a palmarium, balconies, billiard-room, cricket ground and cycle track.

Ruskin's Grave.—The memorial stone which has been placed on the grave of John Ruskin, in Coniston Churchyard, forms a cross of the type lately revived from the models of the age before the Norman Conquest. It was cut from the neighbouring Tiberthwaite quarries, and, with its base, is a little over 9ft. high. The only inscription gives the name and dates of birth and death. The remainder of the stone is beautifully carved with symbolical representations of Ruskin's principal works, from the designs of Mr. W. G. Collingwood, of Coniston. The sculptor was Mr. H. T. Miles, of Ulverston.

A Memorial of the Late Duke of Westminster in connection with his efforts to provide sites for working-class dwellings on his London estate was unveiled last week. The memorial consists of a bronze tablet affixed to the wall of the buildings overlooking the public garden in Duke Street. Upon it is a representation in *basso relievo* of the head and shoulders of the late Duke. Mr. Taubman was the sculptor. Sir Sidney Waterloo said the company had been prompted to erect the memorial from a feeling of gratitude to the late Duke, who was one of the best great landlords of the Metropolis, and had devoted his influence and great wealth to the promotion of all kinds of philanthropic objects. It was about fifteen or sixteen years ago that he first became connected with the Improved Industrial Dwellings Company, to whom he leased plots of ground greatly below their value for the working people of the district. In this way 773 dwellings had been provided for 4,000 persons. The dwellings were never unoccupied, and were undoubtedly a great convenience to the working classes of the district.

Statues of the late M. Jules Simon, philosopher and statesman, are to be erected in the Place de la Madeleine Paris, and in Lorient, his native city.

A Stained-Glass Window at Mersham Church has been erected to the memory of the late Rev. Frederick Bernard Lockwood, a former rector and canon of Canterbury Cathedral.

Christ's Hospital.—At last week's meeting of the Court of Common Council a report was read from the City Lands Committee in which they stated that they were not prepared to recommend any opposition being offered to the acquisition by St. Bartholomew's Hospital of the land occupied by Christ's Hospital, which would become vacant by the removal of the school to Horsham. The report was adopted.

A Memorial Arch for New York.—The designs of Mr. Ernest Flagg for the New York Naval Arch have been finally approved by the promoters of the undertaking, and a committee has been appointed to raise funds for carrying it into execution. Meanwhile the design is to be submitted to the Municipal Art Commission, whose sanction is necessary before it can be erected. The cost of the monument is now estimated at eleven hundred and thirty thousand dollars.

The Society of Lovers of Old Paris is agitating for the removal of the bronze statue of Napoleon I., by Seurre, from the depôt where it lies at present to one of the museums of Paris. This statue of the Emperor shows him in the well-known greatcoat and *petit chapeau*. It was taken from the top of the Vendôme Column during the Second Empire and replaced by the Cæsarean Napoleon, which was destroyed when the Communists demolished the column thirty years ago.

A Discovery of a Masterpiece has just been made in a convent in the Latin Quartier, formerly the residence of the Comte de Chambrun. It is the work of Clodion, a famous sculptor of the eighteenth century—a bas-relief composed of four great friezes and four lunettes. The Ville de Paris is anxious to acquire possession of the work, but the price demanded is too high, and for the moment negotiations are in abeyance. But there is no danger of harm befalling the sculpture, as it will be well cared for in its present position.

A Monument to Officers and Men of H.M.S. "Powerful" who died in the South African Campaign has been erected in Victoria Park, Portsmouth. The monument is 24ft. high, the bottom stone being of York landing, 6ft. 6in. sq. Then comes a granite dressed base, on the top of which is a moulded base, above this being the die stone, with the inscriptions. This is polished and dressed, as is also the surmounting cap and needle, the latter being 12ft. high. Peterhead granite alone has been used in its construction. The base is 5ft. sq. and 1ft. 7in. deep. The monument was designed by Fleet-Engineer Edwards, of the "Powerful," and the work was executed by Young Bros., of Highland Road, Eastney.

King Alfred's Millenary.—The city of Winchester, in which the representatives of universities and learned societies will shortly assemble, was the capital of King Alfred. The National Home-Reading Union has arranged to hold its summer assembly in Winchester from June 22nd until June 29th, when the members of the assembly will disperse, visiting Athelney or Wantage. During the week lectures will be given by Dean Stubbs, the Bishop of Bristol, Professor Skeat, the Rev. Dugald MacFadyen, Mr. P. H. Wicksteed, Dr. T. J. Lawrence, sometime Deputy Whewell Professor of International Law at Cambridge, the Dean of Winchester on "Winchester Cathedral," Mr. N. C. H. Nisbett on "Wolvesey Castle," Mr. J. E. Marr, F.R.S., Sec. G.S., on "The Application of Geology to Scenery," and others. The last named lecture indicates a secondary purpose of the meeting; namely, the study of the geology and botany of the district, as well as its archæology. The afternoons of the assembly will be devoted to visits to the places and monuments associated with the great king's fame, as well as to the exploration of the memorials of mediæval times with which the district abounds. The assembly is open to all who obtain tickets, price 10s. 6d., from the secretary N.H.R.U., Surrey House, Victoria Embankment, London, W.C.

THE KING AND THE "B. J."

LAST week's catastrophe to "Shamrock II." in the Solent, when His Majesty's life was so seriously imperilled, is a poignant example of the suddenness of accident.

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Masters and Men.

The Masons and Builders Association of New York has locked out between 15,000 and 20,000 bricklayers owing to differences which have arisen.

The Penrhyn Quarry Dispute.—The following notice, dated May 20th, has been issued by the manager of the Penrhyn Quarry: "The Penrhyn Quarry will be open on Tuesday, June 11th, to all the late employees who have applied for work and have been accepted. As announced in February last, the discipline rules have been relaxed, and a new rule has been drawn up and agreed upon which will practically give a half-holiday on the last day of every month; in other respects the quarry rules remain as before. (The new rules referred to are given below.) During the next fortnight (*i.e.*, not later than Tuesday, June 4th) I am prepared to receive further applications from late employees (except boys) who wish to return to work. All applicants must give their former quarry number and 'ponc,' also full name and address. Applications from 'boys' for readmission to the quarry cannot be considered until at least a fortnight after the commencement of work by the men. In order to enforce the law concerning intimidation or annoyance by violence or otherwise (under the Conspiracy and Protection Act) efficient police protection has been promised by the chief constable, Colonel Ruck.—E. A. YOUNG." The new rules referred to above are: Discipline.—All punishments will be by "suspension" or dismissal. For instance, if a workman comes late (except through sickness or sudden case of great emergency) he will the first time be "cautioned," the second time suspended quarter day, third offence half day; but persistent offenders would be more seriously punished or dismissed. Settling Day.—On the last Tuesday in each quarry month the employees after giving up their slates, settling their accounts and arranging their bargains for the coming month will be free to leave the quarry if they wish for the remainder of the day.

Strikes in Italy.—At Milan the masons, bricklayers and men employed in all branches of the building trade have gone out on strike. At Milan they number at least 12,000. An important feature of the strike is the organisation of the men, who have divided themselves, military fashion, into detachments, each of which has a commander and several lieutenants. The causes of the strike are not very clear, and it seems to be rather a rehearsal for some bigger event than a genuine demand for higher wages or shorter hours. This supposition is also borne out by the military organisation.

Trade and Craft.

The Manufacture of "Teon" Belting.—New plant for the manufacture of "Teon" belting, a speciality of the firm of Fleming, Birkby & Goodall, Ltd., West Grove Mill, Halifax, was inaugurated recently at the branch works at Fleetwood. The principal part of the new installation is a calender 22 tons in weight, with 22in. rollers of chilled steel, and formidable diagonally-cogged wheels. The rollers stretch and squeeze the specially woven fabric which constitutes the basis of the belt, composition being at the same time frictioned into the cloth, the work being done at the rate of three yards per minute. The speciality of "Teon" is this secret cement, which first undergoes adequate pounding in an adjoining press, and is then transferred to the calender. Moisture to soften the compo during the process is derived from the hollowed rollers, which may be charged with either steam or water. The pressure in the calender is such that an inch plank of deal is reduced in thickness to a quarter. The composition used in "Teon" is thus squeezed or "keyed" into the very fibres of the cloth, and there is no chance of peeling it off after the operation. Other processes are necessary before the finished belting is obtained. The cloth, now saturated with the composition, is built up in plies, which are folded and sewn and the whole cemented by a patent process under a pressure of 2,000lb. per square inch and in a suitably high temperature. The sewing is done by means of a trio of Singer's machines, running tandem fashion—a device for saving time and increasing output. The belting is next painted and varnished, and then is ready for the market. In one part of the Fleetwood establishment belting for motor-driving and severer strains is machine-stitched with copper wire. A demonstration of tests on "Teon" and competitive belts was also given. The makers claim for "Teon" that it has an efficacy and durability not found in any other belt on the British market, being unaffected in variable, extreme and chemically-charged atmospheres and abnormal conditions generally, which have been the bane of belt driving. Pieces of "Teon" had been for twenty-four hours soaked in strong solutions of caustic soda, of ammonia, in acids and in lubricating oil. The effect on the cementing material was inappreciable, and there was no separation of the fabric whatever. Samples were also immersed in boiling water, and a pipe from the boiler poured in a 50lb. pressure of steam. Two minutes' exposure to this trial told a tale on two of the samples, their cement becoming soft and sticky, and the folds of the material opening with very little persuasion; on the other hand, "Teon" was not in the least affected. Other pieces were exposed to a current of live steam. Again "Teon" came out unimpaired, whereas the composite covering of another belting actually caught fire. Similar severe scientific tests with the belting have been made by Messrs. Stanger & Blount, Westminster, and by Mr. W. Ackroyd, F.I.C., the Halifax analyst, and these tests showed the belt to be capable of resisting the action of dry heat up to 230 degs. Fahr., and of steam up to 200 degs. Fahr.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
May 31	West Hartlepool—School Buildings	School	School Board Offices, Park Road, West Hartlepool.
„ 31	Portreath—Buildings	—	Portreath Coast Guard Station, Portreath.
„ 31	Inishtrahull Island—Schoolhouse, &c.	—	Corbett, Lloyd's Agent. Slipquay Street, Londonderry.
„ 31	Wrexham—Reboarding	—	R. J. Kendrick, Clerk, Wrexham.
„ 31	Middlesbrough—Bricks	Stores Committee	B. Wintersgill, 42 Commercial Street, Middlesbrough.
„ 31	Oswestry—Bricks, &c.	Cambrian Railway Co.	Stores Office, Cambrian Works, Oswestry.
„ 31	Abertillery, Mon.—Gymnasium	Trustees Workmen's Institute	F. R. Bates, 26 Westgate Chambers, Newport.
„ 31	Belfast—Bank Office	Ulster Bank, Ltd.	W. H. Stephen & Son, Donegall Square North, Belfast.
„ 31	Clough, co. Down, Ireland—Hall	Committee of the 1st Presbyterian Church	Blackwood and Jury, 41 Donegall Place, Belfast.
„ 31	Edenderry, Ireland—Cottages	Rural District Council	Waters, Civil Engineer, Edenderry.
„ 31	Hamilton, Scotland—House, &c.	District Committe	W. L. Balmer, 84 Quarry Street, Hamilton.
„ 31	Newcastle-on-Tyne—Gallery	—	Cackett & Burns Dick, 24 Grainger St. West, Newcastle-on-Tyne.
„ 31	Newcastle-on-Tyne—Pumping Station Buildings	New Tramway's Committee	C. Hopkinson, 29 Princess Street, Manchester.
„ 31	Zennor, Cornwall—Cattle House	—	J. Thomas, Zennor.
„ 31	Brighton—Portland Cement	Corporation	F. J. C. May, Borough Engineer, Town Hall, Brighton.
June 1	Corntown, nr. Cornwood, Devon Cottages	—	S. Coyte, Cornwood.
„ 1	Selby Park, Birmingham—Catholic Church	—	H. T. Sandy, 22 Greengate, Stafford.
„ 1	Glenelg, Scotland—Additions, &c.	Public School	S. Fraser, Dochfour Office, Queen's House, Inverness.
„ 1	Hayling, Ireland, Havant—Classrooms	Committee of the National Schools	H. F. Trigg, opposite the Railway Station, South, Hayling.
„ 1	Leeds—Building, &c.	Trustees of Wesleyan Chapel	G. F. Danby, 10 Park Row, Leeds.
„ 1	London, S.E.—Brick Graves, &c.	Borough Cemeteries Committee	E. H. Oxenham, Lewisham Town Hall, Catford, S.E.
„ 1	Farnborough, Kent—Mortuary and Post Mortem Room	Bromley Union Guardians	J. Ladds, 7 Doughty Street, Mecklenburg Square, W.C.
„ 3	Gloucester—School	School Board	M. H. Medland, 15 Clarence Street, Gloucester.
„ 3	Penlee Point, Cornwall—Fog Signal House	—	Coast Guard Station, Cawsand, Cornwall.
„ 3	Denbigh—School Buildings	—	A. Foulkes-Roberts, Clerk to the Governors, Denbigh.
„ 3	Kingston-on-Thames—Boiler House	Guardians	W. H. Hope, Architect and Surveyor, Hampton Wick.
„ 3	Tredegar, Mon.—Classroom, &c.	Bedwellty School Board	C. Dauncey, Castle Street, Tredegar.
„ 3	Swansea—Workshop, &c.	Technical Instruction Committee	Secretary, Grammar School, Swansea.
„ 3	Stafford—Works	Siemens Bros. & Co., Ltd.	Siemens Bros. & Co., Ltd., Woolwich.
„ 3	Lancaster—Hotel	Yates and Jackson	C. J. Ashworth, Market Street, Chambers, Lancaster.
„ 3	Fermoy, Ireland—Club	—	J. F. McMullen, 30 South Mall, Cork.
„ 3	Plymouth—Two Pavilions, &c.	Corporation	G. D. Bellamy, 6a Courtenay Street, Plymouth.
„ 4	Stratford-on-Avon—House	—	T. T. Allen, Architect, Stratford-on-Avon.
„ 4	Uxbridge—Generating Station	Electric Supply Co., Ltd.	Secretary, 1 Vine Street, Uxbridge.
„ 4	Winchester—Additions to Public House, &c.	Welsh & Co., Ltd.	T. Stopher, 57 High Street, Winchester.
„ 4	Aldershot—Buildings, &c.	Urban District Council	N. F. Dennis, Council's Surveyor, Aldershot.
„ 4	Harrogate—Kursaal	Corporation	R. J. Beale, Broadway House, 3 The Broadway, Westminster.
„ 5	Hull—Coal Depots, &c.	N. E. Railway Co.	W. J. Cudworth, Company's Engineer, York.
„ 5	Peckham, S.E.—Relief Station	St. Giles', Camberwell, Guardians	A. E. Mullins, 16 Church Street, Camberwell, S.E.
„ 5	Hove, Sussex—Underground Lavatories, &c	—	Borough Surveyor's Office, Town Hall, Hove.
„ 6	Bishop Auckland—Warehouses	Industrial Co-op. Flour & Provn. Soc. Ltd.	F. H. Livesay, 107 Newgate Street, Bishop Auckland.
„ 6	Southend-on-Sea—Houses	Corporation	A. Fidler, Borough Surveyor, Southend.
„ 6	Wall, Gwinear, Cornwall—Renovation, &c.	—	T. Scroden, Wall, Gwinear.
„ 8	Uxbridge, Middlesex—Electricity Generating Station	Electric Supply Co., Ltd.	W. A. Bird, 1 Vine Street, Uxbridge.
	ENGINEERING:		
May 31	Milton, Stirlingshire—Reservoir, &c.	County Council	Warren and Stuart, 94 Hope Street, Glasgow.
„ 31	Braidwood, Scotland—Waterworks	Water Committee	Warren & Stuart, 94 Hope Street, Glasgow.
„ 31	Sunderland—Coal Bunkers	Corporation	J. F. C. Snell, Dunning Street, Sunderland.
June 1	Christiania—Materials	Government	Afdelingsingeniörens Kontor, Arendal Aamli Banen, Arendal.
„ 3	Dublin—Plant	Corporation	S. Harty, City Hall, Dublin.
„ 3	Madrid—Tramways	Spanish Government	Commercial Department, Foreign Office, Madrid.
„ 3	Salford—Reconstruction of Bridge	Corporation	C. S. Allott & Son, 46 Brown Street, Manchester.
„ 3	Kingston-on-Thames—Boilers	Workhouse Guardians	W. H. Hope, Architect, Hampton Wick.
„ 4	Coveyheugh, Scotland—Bridge	—	T. Meek & Sons, 29 St. Andrew's Square, Edinburgh.
„ 4	India Office, S.W.—Engines, &c.	—	Director General of Stores, India Office, Whitehall, S.W.
„ 4	Kirkcaldy—Heating	District Committee of Fife C.C.	Foyers & Penman, 22 Bath Street, Largs, Ayrshire.
„ 5	Melton Mowbray, Leicester—Waterworks	Urban District Council	Latham, Parliament Mansions, Victoria Street, Westminster.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ENGINEERING—*continued.*		
June 6	London, N.W.—Wiring	Hendon Urban District Council	R. Hammond, 64 Victoria Street, Westminster, S.W.
,, 6	Sheffield—Cannel Breakers, &c.	United Gaslight Co.	J. W. Morrison, Commercial Street, Sheffield.
,, 6	Cheadle, Stoke-on-Trent—Waterworks	Rural District Council	F. T. Inskip, Surveyor, Brookhouse, Cheadle.
,, 8	St. Petersburg—Embankment		St. Petersburg Town Council (Stadtamt).
,, 8	Rio de Janeiro—Electrical Machinery	Brazilian Government	Commercial Department, Foreign Office, S.W.
,, 8	Ipswich—Boilers, &c.	Corporation	W. Bantoft, Town Clerk, Town Hall, Ipswich.
,, 10	Egremont, Cheshire, Widening, &c., Ferry Pier	Wallasey Urban District Council	Ferry Manager, Egremont Ferry, Cheshire.
,, 10	Rochford, Essex—Water Mains, &c.	Rural District Council	J. Mansergh, 5 Victoria Street, Westminster.
,, 10	Burnley—Injectors, &c.	Electricity Committee	R. Birkett, Borough Engineer, Aqueduct Street, Burnley.
,, 10	Leamington—Weir	Corporation	W. de Normanville, Town Hall, Leamington.
,, 10	Preston, Lancs—Fuel Economiser, &c.	Guardians	Whitwell, Engineer, Fulwood Workhouse, Preston.
,, 10	Glasgow—Electricity Meters	Corporation	W. A. Chamen, 75 Waterloo Street, Glasgow.
,, 10	Dartford, Kent—Laundry Machinery, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
,, 11	Isleworth, W.—Gas Mains, Electric Light Wiring, &c.	Brentford Union Gardens	W. H. Ward, Architect, Paradise Street, Birmingham.
,, 11	Isleworth, W.—Hot Water Supply, Range, &c.	Brentford Union Gardens	W. Stevens, Clerk, Union Offices, Isleworth, W.
,, 11	Yeardsley-cum-Whaley—Reservoir, &c.	Urban District Council	Sterling & Swann, Town Hall, Chapel-en-le-Frith.
	IRON AND STEEL:		
May 31	Oswestry—Bar & Sheet Iron	Cambrian Railways Company	Stores Office, Cambrian Works, Oswestry.
,, 31	Middlesbrough—Stores	Stores Committee	B. Wintersgill, 42 Commercial Street, Middlesbrough.
June 1	Penrhiwceiber, Glamorgan—Iron, Steel and Chains	Penrikyber Navigation Colliery Co., Ltd.	Secretary to Company, Penrhiwceiber, S.O., Glamorgan.
,, 1	South Kirkby, nr. Wakefield—Lamp Columns, &c.	Parish Council	Clerk to Council, South Kirkby.
,, 3	Salford—Steel Poles, &c.	Corporation	Lacey, Clivehugh & Sillar, 2 Queen Anne's Gate, Westminster.
,, 3	Doncaster—Steel Tramway Rails	Corporation	W. H. R. Crabtree, 3 Priory Place, Doncaster.
,, 6	Cardiff—Cast Iron Girders, Columns, &c.	Corporation	C. H. Priestley, Waterworks Engineer, Town Hall, Cardiff.
,, 11	Yeardsley-cum-Whaley—Cast Iron Pipes	Urban District Council	Sterling & Swann, Town Hall, Chapel-en-le-Frith.
,, 11	London, S.W.—Rails, &c.	Queensland Railways	Queensland Government Office, 1 Victoria Street, S.W.
,, 12	Bradford—Cast Iron Gullies, Grates, &c.	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford.
,, 14	Preston—Pipes	Corporation	T. Cookson, Town Hall, Preston.
July 1	Calcutta—Bins	Corporation	Chairman of Corporation, Calcutta.
	PAINTING AND PLUMBING:		
May 31	Oswestry—Paints, Turpentine, &c.	Cambrian Railways Company	Stores Office, Cambrian Works, Oswestry.
,, 31	Abertillery, Mon.—Painting, &c. Workmen's Institute	Trustees	F. R. Bates, 26 Westgate Chambers, Newport.
,, 31	Middlesbrough—Oils, Paints, Lead, &c.	Stores Committee	B. Wintersgill, 42 Commercial Street, Middlesbrough.
June 1	Penrhiwceiber, Glamorgan—Paints, Brushes, &c.	Penrikyber Navigation Colliery Co., Ltd.	Secretary to Company, Penrhiwceiber, Glamorgan.
,, 3	Walsall—Painting Four Gasholders	Corporation	B. W. Smith, Gas Engineer, Pleck Gasworks, Walsall.
,, 3	Halifax—Colouring and Painting Schools	School Board	W. H. Ostler, 22 Union Street, Halifax.
,, 3	London, W.—Painting, Whitewashing, &c., Asylum	Central London Silk Asylum	F. W. Bailey, Cleveland Street Asylum, Cleveland Street, W.
,, 4	Tanfield, Durham—Painting, Colouring, &c., School	School Board	W. H. Ritson, Clerk, Manchester.
,, 5	London, E.C.—Painting Central Meat Market	Corporation	Surveyor, Guildhall, E.C.
,, 6	Southampton—Painting, &c., at Harbour Offices	Harbour Board	W. Boyoyer, Clerk, Board's Offices, Town Quay.
,, 6	Southend-on-Sea—Painting Shelters	Corporation	A. Fidler, Borough Surveyor, Southend.
,, 6	Leavesden, nr. Waterford, Herts—Painting, &c.	St. Pancras Gardens	W. T. Farthing, 46 Strand, W.C.
,, 10	Aberdeen—Limewashing	Town Council	Sanitary Inspector, City Buildings, Aberdeen.
,, 18	Preston—Painting, &c., Cattle Market	Corporation	Borough Surveyor, Town Hall, Preston.
,, 18	London, S.W.—Painting, Varnishing, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
Aug. 5	Cleckheaton—Interior Renovation of Church		Wesleyan Church, Whitcliffe Road, Cleckheaton.
	ROADS AND CARTAGE:		
May 31	Little Woolton, Liverpool—Macadam	Urban District Council	R. Simmons, Grange Lane, Gateacre, nr. Liverpool.
,, 31	Middlesborough—Road Materials	Corporation	B. Wintersgill, 42 Commercial Street, Middlesbrough.
June 1	Saffron Walden, Essex—Granite Macadam	Corporation	A. H. Forbes, Borough Surveyor, Saffron Walden.
,, 1	Thirsk, Yorks—Materials	Rural District Council	C. McC. Swarbeck, Clerk, Thirsk.
,, 3	London, S.E.—Materials	Bermondsey Borough Council	R. J. Angel, Borough Surveyor, Town Hall, Spa Road, S.E.
,, 3	Royston—Kerbing, Paving, &c., Footpaths	Herts County Council	U. A. Smith, 41 Parliament Street, S.W.
,, 3	Withington, Lancs—Works	Urban District Council	A. H. Mountain, Surveyor, Town Hall, Withington.
,, 3	Leeds—Materials, &c.	Rural District Council	J. H. Ford, Clerk, Poor-Law Office, Leeds.
,, 3	Facit, near Rochdale—Granite Macadam	Whitworth Urban District Council	T. Biker, Surveyor, Facit.
,, 3	West Didsbury, Manchester—Watering Van, &c.	Withington Urban District Council	A. H. Mountain, Surveyor, Town Hall, Withington.
,, 3	Penge—Kerbing, Tarpaving, &c.	Urban District Council	H. W. Longdin, Surveyor, Town Hall, Anerley, S.E.
,, 4	Leyton—Street Works	Urban District Council	W. Dawson, Council's Surveyor, Town Hall, Leyton.
,, 4	Maidstone—Materials	Urban District Council	F. Bunting, Surveyor, Fair Meadow, Maidstone.
,, 4	King's Lynn—Road Materials	Corporation	H. J. Weaver, Borough Surveyor, King's Lynn.
,, 4	Milnrow, Lancs—Road Materials, &c.	District Council	W. H. Foster, Surveyor, Council Offices, Milnrow.
,, 4	East Grinstead—Road Material and Steam Rolling	Urban District Council	R. Wilds, Surveyor, Council Offices, East Grinstead.
,, 6	London, W.—Making-up Road	Ealing Urban District Council	C. Jones, Surveyor, Public Buildings, Ealing, W.
,, 6	Southend-on-Sea—Widening Roadway	Corporation	A. Fidler, Borough Surveyor, Southend.
,, 10	Crewe—Street Works	Town Council	G. E. Shore, Borough Surveyor, Earle Street, Crewe.
,, 10	Rochford—Widening Road	Rural District Council	F. Whitmore, Surveyor, Chelmsford.
,, 11	London, N.—Tar and Asphalt Paving	Tottenham Urban District Council	W. H. Prescott, 712 High Road, Tottenham, N.
,, 16	Wimbledon—Dust Vans	Urban District Council	C. H. Cooper, Surveyor, The Broadway, Wimbledon.
	SANITARY:		
May 31	Oswestry—Drain Pipes, Lime, &c.	Cambrian Railways Co.	Stores Office, Cambrian Works, Oswestry.
,, 31	Middlesbrough—Sanitary Lime	Stores Committee	B. Wintersgill, 42 Commercial Street, Middlesbrough.
June 1	Harrow—Drainage, &c.	Urban District Council	J. P. Bennetts, Surveyor, Council Offices, Harrow.
,, 1	Penrhiwceiber, Glamorgan—Lime and Cement	Penrikyber Navigation Colliery Co., Ltd.	Secretary to Company, Penrhiwceiber, S.O., Glamorgan.
,, 3	Billericay—Stoneware Pipe Sewers	Rural District Council	B. Denton, Son & Lawford, Palace Chbs., 9 Bridge St., Westminster.
,, 5	Seaford—Sewage Outfall Pipe	Urban District Council	B. A. Miller, 3 Clinton Place, Seaford.
,, 5	Hove, Sussex—Sewer Works		Borough Surveyor, Town Hall, Hove.
,, 10	Clayton-le-Moors, Lancs—Materials	Joint Sewerage Board	Brierley & Holt, 20 Richmond Terrace, Blackburn.
,, 11	West Ham—Conveniences	Town Council	Borough Engineer, Town Hall, West Ham, E.
,, 13	Hurst, Lancs—Converting Closets	Urban District Council	Inspector of Nuisances, Council Offices, King Street, Hurst.
,, 25	Strathaven, Scotland—Sewage Works	District Committee	W. L. Douglass, 3 Clydesdale Street, Hamilton.
	TIMBER:		
May 31	Oswestry—Timber	Cambrian Railways Company	Stores Office, Cambrian Works, Oswestry.
,, 31	Middlesbrough—Timber	Stores Committee	B. Wintersgill, 42 Commercial Street, Middlesbrough.
June 3	London, W.—Wood Blocks	St. Marylebone Borough Council	J. P. Waddington, Borough Survyr., Town Hall, Marylebone Ln., W.
,, 4	Genoa—Teak & Pitch pine Wood	Director-General of Naval Arsenal, Spezia	Commercial Department, Foreign Office, S.W.
,, 6	Southampton—Timber	Director-General Ordnance Survey	Officer in Charge of Stores, Ordnance Survey Office, Southampton.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
June 8	Buxton—Water Pump	£20, £10, and £5	W. H. Grieves, Town Surveyor, Town Hall, Buxton.
,, 10	Ennis, co. Clare—Additions, &c. to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
,, 24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100	W. H. Talbot, Town Clerk, Town Hall, Manchester.
,, 24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
,, 30	Hereford—Municipal Buildings	£100, £75, £50	J. Carless, Offa Street, Hereford.
July 31	Manchester—Fire Station and Police Station	£300, £200 and £100	W. H. Talbot, Town Hall, Manchester.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 7 6	—
Clover, best	per load	4 5 0	5 2 6
Hay, best	do.	4 7 0	4 15 0
Sainfoin mixture	do.	3 15 0	4 12 6
Straw	do.	1 8 0	1 16 0

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French	per cwt.	1 8 7	1 9 2
Colza Oil, English	do.	1 9 0	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 3 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do.	1 0 4½	—
Linseed Oil, barrels	do.	1 13 3	1 13 6
Petroleum, American	per gal.	0 0 6¼	0 0 6⅜
Do. Russian	do.	0 0 5¾	0 0 5⅞
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	2 18 6	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt	per cwt.	1 4 6	1 5 3
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	1 7 3	—

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong	per ton	85 0 0	—
Iron, Staffs., bar	do.	6 0 0	9 10 0
Do. Galvanised Corrugated sheet	do.	11 5 0	11 10 0
Lead, pig, Spanish	per ton	12 6 3	—
Do. do. English common brands	do.	12 15 0	—
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17 9 0	—
Do. pipe	do.	18 3 0	—
Nails, cut clasp, 3in. to 6in.	do.	12 0 0	13 0 0
Do. floor brads	do.	11 15 0	12 15 0
Steel, Staffs., Girders and Angles	do.	6 0 0	6 5 0
Do. Mild Bars	do.	7 0 0	7 10 0
Tin, Foreign	do.	130 5 0	130 15 0
Do. English ingots	do.	132 0 0	—
Zinc, sheets, Silesian	do.	22 0 0	—
Do. do. Vieille Montaigne	do.	22 10 0	—
Do. Spelter	do.	18 15 0	—

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load	3 0 0	4 0 0
Pine, Quebec Yellow	do.	4 7 6	6 0 0
Pine, Pitch	per load	2 9 0	3 0 0
Laths, log, Dantzic	per fath.	4 10 0	5 10 0
Do. Petersburg	per bundle	0 0 9	0 0 10½
Deals, Archangel 2nd & 1st	per P.Std.	9 5 0	12 10 0
Do. do. 4th & 3rd	do.	11 15 0	13 5 0
Do. do. unsorted	do.	—	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	21 0 0	—
Do. do. 2nd „	do.	19 0 0	—
Do. do. unsorted	do.	12 15 0	—
Do. do. White	do.	9 10 0	11 5 0
Do. Swedish	do.	9 15 0	11 0 0
Do. White Sea	do.	9 15 0	13 0 0
Do. Quebec Pine, 1st	do.	22 0 0	23 0 0
Do. do. 2nd	do.	19 15 0	—
Do. do. 3rd &c.	do.	13 10 0	—
Do. Canadian Spruce, 1st	do.	12 5 0	—
Do. do. 3rd & 2nd	do.	9 5 0	10 0 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	6 5 0	10 0 0
Flooring Boards, 1in. prepared, 1st	per square	0 13 3	—
Do. 2nd	do.	0 9 6	—
Do. 3rd &c.	do.	0 8 6	—

COMING EVENTS.

Wednesday, May 29.

SOCIETY OF ARCHITECTS.—Meeting to ascertain the attitude of Scottish Architects on the Architects' Registration Bill, at the Burgh Court Room, City Chambers, Edinburgh, 6 p.m.

Thursday, May 30.

SURVEYOR'S INSTITUTION.—Country Meeting at Southampton (First Day).

GLASGOW INSTITUTE OF ARCHITECTS.—General Meeting at 2 p.m.

SOCIETY OF ARCHITECTS.—Meeting to ascertain the attitude of Scottish Architects on the Architects' Registration Bill, at the Philosophical Society's Room, 207, Bath Street, Glasgow, 6 p.m.

Friday, May 31.

SURVEYOR'S INSTITUTION.—Country Meeting at Southampton (Second and last Day).

Saturday, June 1.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Visits to The Round Tower, Abernethy, and Balmano Castle.

Monday, June 3.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Business Meeting: Annual Elections.

SURVEYORS' INSTITUTION.—Annual General Meeting at 3 p.m.

SOCIETY OF ENGINEERS.—Ordinary Meeting at 7.30 p.m.

Tuesday, June 4.

GLASGOW ARCHITECTURAL ASSOCIATION.—Annual Business Meeting.

Wednesday, June 5.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BARRHEAD (SCOTLAND).—For the causewaying, &c. of Cross Arthurlie Street, for the Town Council. Mr. Charles E. Wardlaw, engineer, 112 Bath Street, Glasgow:—

A. Thomson, Pollokshaws	£3,416 0 1
North British Granite and Whinstone Quarries, Limited, Glasgow	3,346 4 6
C. McAndrew, Ayr	3,202 17 7
Morton & Anderson, Glasgow	3,199 19 2
J. & J. Neilson, Chryston	3,083 1 0
W. Wilson, Glasgow	3,075 13 2
Craik & Tuckwell, Glasgow	2,788 19 10
A. A. R. Lang,* Gourock	2,671 4 3

* Accepted.

BRAY (Co. WICKLOW, IRELAND).—Accepted for the erection of a summer residence in cement for Professor Barrett, F.R.S. Messrs. Clare & Ross, architects, Chelmsford and London:—

A. Frazer, Bray	£577

CHAILEY (SUSSEX).—For alterations and additions to the Chailey Workhouse, Sussex, and for erection of a nurses' home, for the Guardians of Lewes Union. Mr. H. Gurtis Card, F.S.I., architect, 10 North Street, Lewes:—

Box & Turner, Ardingly	£2,546
Peerless Dennis & Co., Eastbourne	2,445
Cook & Son, Crawley	2,436
Anscombe & Hedgecock, Lindfield	2,366
W. Wells,* Plumpton	2,330

* Accepted.

CHATHAM.—For the erection of a laundry at Boster's Hill, Chatham. Mr. H. H. Dunstall, architect:—

W. C. Snow	£1,519	J. D. Corke	£1,248
George West	1,325	H. E. Phillips	1,245
West Bros.	1,324	Trueman & Son*	1,219
W. Corker	1,322		

* Accepted.

CHATHAM.—For the erection of a free library and museum in New Road, Chatham, for the Chatham Town Council. Mr. G. E. Bond, architect:—

W. C. Snow	£5,400	J. D. Corke	£4,250
G. West	5,025	H. E. Phillips	4,250
E. W. Filley	4,995	West Bros.	4,198
Gann	4,945		

[This amounting to more money than the Corporation is prepared to spend, none have been accepted, and the architect is to prepare new plans.]

FOXROCK (Co. DUBLIN, IRELAND).—For the erection of 12 artizans' one-storey cottages in concrete, for the Royal Exchange Assurance Corporation, London and Dublin. Messrs. Clare & Ross, architects, Chelmsford and London:—

W. J. Elsdon, Sible Hedingham, Essex	£1,689
A. Frazer,* Bray, Co. Wicklow	1,600

* Accepted.

GREAT GRIMSBY.—For erection of schools on the Harold Street site in New Clee, for the Great Grimsby School Board. Mr. H. C. Scaping, architect, Court Chambers, Grimsby:—

Pattinson & Sons, London	£22,845
F. Beilby, Hull	20,300
A. Sime	19,984
Hewins & Goodland	19,854
Gilbert & Kirton	18,650
J. M. Thompson & Sons*	18,200

[Rest of Grimsby.]

* Accepted.

HAROLD WOOD (ESSEX).—For the erection of a detached house for D. Bradshaw, Esq., on the Upper Heathfield Building Estate. Messrs. Clare & Ross, architects, Chelmsford and London:—

W. J. Coleman & Co., London	£1,490
J. Smith & Son, Witham	1,395
S. Parmenter, Braintree	1,299
Field Clare & Co., Stratford	1,200
Dupont & Co. Colchester	1,157
H. Young,* Plaistow	1,050

* Accepted.

KELVEDON (ESSEX).—Accepted for the erection of eight cottages in concrete, for Miss Docwra. Messrs. Clare & Ross, architects, Chelmsford and London:—

Clare Bros., 38 Borthwick Road, Stratford	£1,668

LEAMINGTON.—Accepted for the erection of a house, for Mr. R. D. Sykes. Mr. H. O. Cresswell, architect, 17 Buckingham Street, Strand, W.C.:—

John Barnsley & Sons, Birmingham	£9,888

LEISTON-CUM-SIZEWELL (SUFFOLK).—For works of sewerage and sewage disposal. Mr. Henry Miller, M.I.C.E., engineer, Ipswich:—

S. Saunders, Earl's Court Square, London	£3,827 0 0
J. Moran & Son, Dovercourt Road, Harwich	3,612 0 0
J. S. Smith, 24 City Road, Norwich	3,549 0 0
W. Manders, Leyton	3,466 10 6
Cutler, Haywood & Co., Lowestoft	3,462 0 0
G. Bell, Tottenham	3,137 0 0
J. Coker, Halling, Rochester	3,125 13 4
J. O. Trueman, Swanley	2,992 0 0
G. Burgoyne & Sons, Ipswich	2,919 1 2
G. Double, Ipswick	2,810 10 0
Grimwood & Sons,* Ipswich	2,597 0 0

* Accepted.

LONDON.—For road repair and drainage works at the Park Hospital, for the Metropolitan Asylums Board:—

J. Weston & Sons, Octavius Street, Deptford, S.E.	£2,095 5 6
T. Adams, Green Lanes Goods Station, Wood Green, N.	1,705 2 0
W. Pearce, David's Road, Forest Hill, S.E.	1,664 9 7
Fry Bros., Lion Wharf, Greenwich, S.E.	1,532 18 0
Weston & Hale, 43 Tubbs Road, Harlesden, N.W.	1,366 18 7
J. Mowlem & Co., Grosvenor Wharf, Westminster, S.W.	1,301 0 0
H. Bentham & Co., Telford Avenue, Streatham Hill, S.W.	1,147 0 0
R. Ballard, Limited,* Child's Hill, N.W.	1,097 0 0

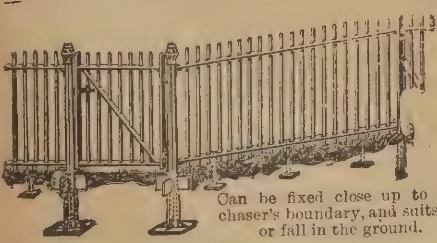
* Accepted.

LUTON.—For the erection of children's homes in the Dunstable Road, Luton, for the Guardians. Mr. B. B. Franklin, architect, 21 Market Hill, Luton:—

J. Saunders & Son, Duke Street	£3,440 0 0
D. Parkins, High Town Road	3,186 0 0
E. Foster, 13 Bury Park Road	2,985 17 9
Mallett & Wood, Melson Street	2,973 0 0
Phillips & Blake, Harpenden, R.S.O.	2,900 0 0
G. W. Dunham,* Guildford Street	2,883 0 0
J. W. Smith, Charles Street, Small Heath, Birmingham	2,877 0 0

[Rest of Luton.]

* Accepted.



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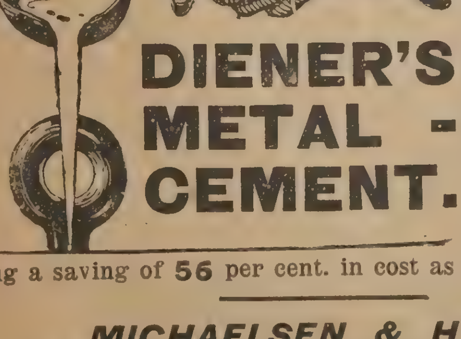

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VULCAN FOUNDRY, THORNABY-ON-TEES.

LONDON, E.C.—For alterations and additions to the town hall, Rosebery Avenue, E.C., for the Finsbury Borough Council:—

Small & Sons, St. John Street, E.C.	£1,616
W. Gladding, 188 Whitechapel Road	1,333
W. Reason,* Rosebery Avenue, E.C.	1,179
Lole & Lightfoot, Trafalgar Square, Chelsea	1,163
Forster Bros., Norwood Junction, S.E.	1,156

* Accepted.

LONDON, E.C.—For extension of offices, for the Star Life Assurance Society, 32 Moorgate Street. Mr. Arthur Blomfield Jackson, architect, 26 Mecklenburgh Square, W.C.:—

Holland & Hannen	£12,350	0	0
Colls & Sons	11,984	0	0
E. Edwards	11,923	0	0
Holloway Bros.	10,728	0	0
Patman & Fotheringham*	10,693	6	10

* Accepted.

SMETHWICK.—For the erection of new Church of St. Stephen, to accommodate 550 adults, for the Rev. Jas. Whiteley. Mr. Fred. T. Beck, architect, Walfrun Chambers, Darlington Street, Wolverhampton. Quantities by Mr. H. Vale, Wolverhampton:—

Collins & Godfrey	£6,148
Moffatt	6,100
Whitehouse	6,075
Smith & Sons	6,050
H. Lovatt	6,020
Sopcote	5,998
Willcock & Co.	5,990
Dallow	5,950
Wistance	5,900
Reynolds	5,850
Harley & Sons,* Smethwick	5,500
J. Mallin	5,390

* Accepted after reduction in competition with Mr. Mallin.

SOUTHMINSTER (ESSEX).—Accepted for the erection of a house for H. J. Summers, Esq.:—

A. Downing, Southminster ... £454

WIMBLEDON PARK.—Accepted for the erection of a detached house. Messrs. Clare & Ross, architects, Chelmsford:—

W. & C. Brown, Clapham ... £1,110

[Tender on amended plans.]

STONE (STAFFS.).—For the erection of a house at Stone, for Mr. S. E. Scrivener, Messrs. R. Scrivener & Sons, architects, Hanley:—

Young & Son, Longton	£1,446
J. Bagnall, Fenton	1,346
Tompkinson & Bettelley, Longton	1,257
G. Ellis, Hanley	1,150
Ward & Son, Uttoxeter	1,134
T. Godwin,* Hanley	1,128

* Accepted.

SWINTON (LANCS.).—For the excavation and construction of bacteria filters at Swinton Sewage Works, for the Swinton and Pendlebury Urban District Council. Mr. Henry Entwistle, surveyor:—

W. A. Stomp, Fixton Cottage, Urmston	£3,426	5	0
J. Gourley & Sons, Chapel Street, Salford	3,217	6	0
A. Lomax, Lostock Hall, near Preston	2,688	2	9
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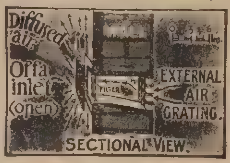

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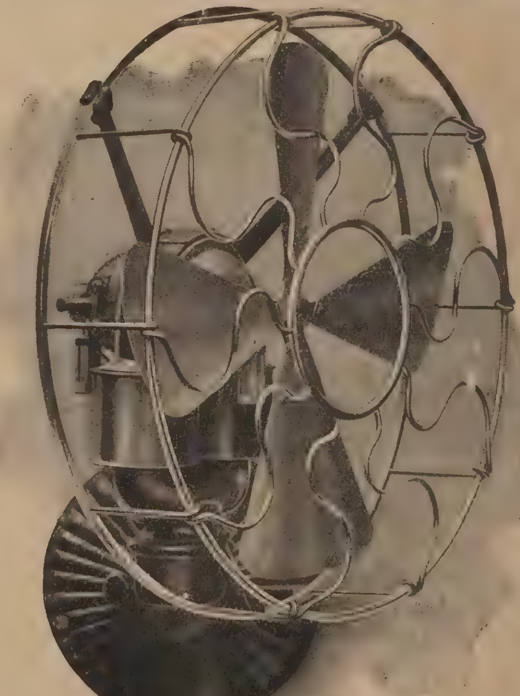

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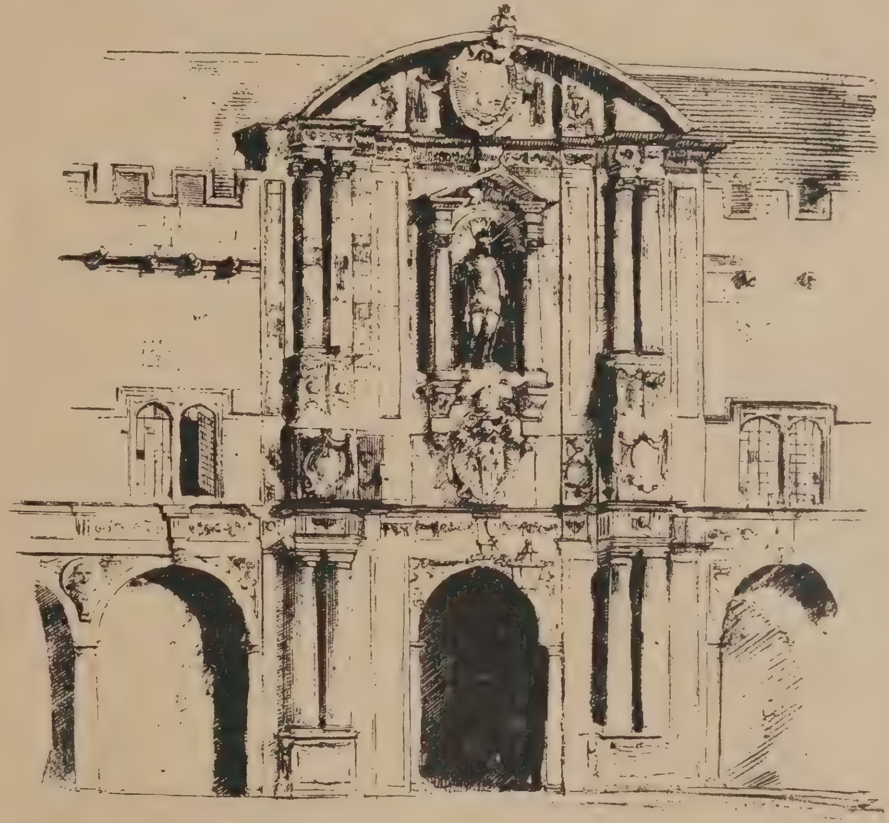
An Architectural Causerie.

The late Mr. Brydon. IT is a melancholy fact that the late Mr. J. M. Brydon should have died just when his huge building for the Local Government Board and Education Department was about to take shape and rise from its vast site in Whitehall—a building to which he devoted so much time, so much energy, so much attention. Remembering this, and recollecting also that Mr. William Young died when his new War Office was almost in a similar condition, one pauses to think of the responsibility and worry entailed by those who have charge of great works. Numerous instances could be mentioned—such as that of Street and the Law Courts—of architects whose lives have been brought to a hurried close by reason of the anxieties of their labours. This is especially the cost of greatness. The care appurtenant to the erection of a large governmental building like that of Mr. Brydon needs no emphasis, and one only wonders that the men can withstand the strain for so long. Mr. Brydon will be greatly missed. He was a kindly gentleman, and those who saw him in the chair at Institute meetings will recall the complaisant manner in which he carried out his duties. He was dignified without being austere, courteous and attentive to everyone's questions, and able to express his opinions clearly and convincingly. Longfellow's lines are very apt:

> "All are architects of Fate,
> Working in these walls of Time;
> Some with massive deeds and great,
> Some with ornaments of rhyme."

Edison and Building. MR. EDISON is a man surrounded by a journalistic halo of glory, and this is the whole explanation of the ridiculous accounts which reach us here of his inventions. We are informed by telegram what wonders are to be effected by his latest devices, and how old methods are to be entirely revolutionised. The latest information about him affects the building industry. The New York telegram runs as follows: "Mr. Edison is reported to have said in an interview that he has invented an improved cement. All buildings in future are to be made of this cement. An iron framework is put up, the cement poured in, the roof thrown on, and in three or four days the house is fit for habitation. Mr. Edison says the cost will be insignificant and rents will be reduced enormously." This is delightfully naïve. We should be much interested to see a building erected in the manner described. Moreover, the confidence which asserts that this cement is to be the universal building material of the future is indeed worthy of an American journalist. We have read accounts of Mr. Edison's inventions before, and we shall wait before we believe in such a report as this one, which, however, is typical of what the American inflicts upon us. Mr. Edison may have invented a new cement, like other persons; also, he may not; but in any case it is not likely to possess the characteristics stated. Newspapers ought not to print such misguiding rubbish, for it is harmful to the public and damages Mr. Edison's reputation.

Stealing Houses. ONE of the most remarkably audacious thefts of building materials we have ever heard of is reported on p. 342 of this issue. The thief was a man named Richards and his speciality was houses. It will be seen how he coolly selected a house which was unoccupied and without the slightest authority enclosed it with a hoarding and razed it to the ground; he then removed the materials and sold them. A man who could carry out such a project is worthy of better things. Richards is now in the employ of the Government for three years.



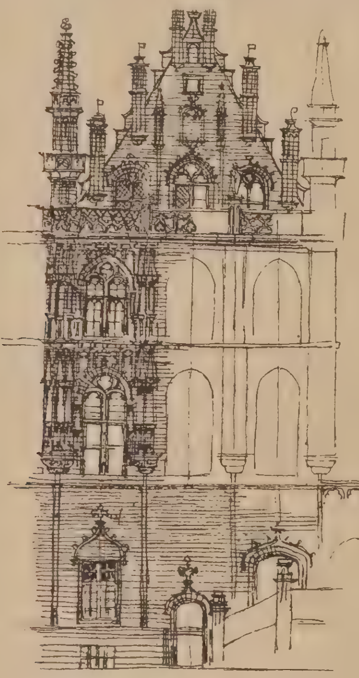
GATEWAY, ST. JOHN'S COLLEGE, OXFORD.

Lady Architects. A POPULAR ladies' magazine has printed an article on "Architecture as a Possible Career for Girls," the whole theme of which resolves itself into "what can be done by a girl merely giving her help in the designing of a house." We are told that people who build houses fail to do so in the best possible way because "they have to make so much percentage every year on the money expended, or the house has been built to sell because of its stained-glass windows." The blame, however, is not laid on the builder's shoulders but on those who buy and live in these houses. The writer deplores the fact that girls do not learn the geography of the perfect house side by side with their French verbs and arithmetic. "They attend lectures on architecture, perhaps are learned in Gothic and Renaissance periods, revel in transepts, and simply adore a gargoyle; but the fact of a cistern being a vital part of their own house appals them, and complaints from the cook on the question of a kitchen sink terrify or merely disgust." The writer then devotes almost all her remaining space to describing the plans of a house "drawn by an expert" which apparently meets all requirements. One of its chief features is a basement portioned off for a wash-house, laundry, heating apparatus, workshop, coal-cellar and dust depository, fitted with lifts and shoots. The expert, however, has arranged his walls in a curious manner, and there is no arrow to show what aspects the various rooms face. Leaving however these particular plans, it is well to consider the main subject. The writer says: "Girls are not welcomed professionally as members of an architectural office staff, and as yet few of them have had the courage to begin work on their own account. The old cry that women will not be able to find workmen to obey them, I refuse to believe in; for, within the writing of this article, I have seen a West-End London house in the hands of two lady architects for alterations, and discovered how efficiently measurers and tradesmen worked under their direction. In America, women are already recognised as capable architects. In Austria, quite recently, a Fräulein Erska Paulas received a valuable Government commission to erect, at Bistritz, a residence for the Official Forest Commissioners. In our own country, to a girl, there are no obstacles of training in her way. The Schools of Art are open to her, and as an articled draughtswoman she may receive an office experience. The Royal Institute of Architects allows women to qualify as Associates, and already two girls have successfully passed their examinations." Lastly, the writer advocates girl consulting-architects in connection with dwellings for the working classes. Now these matters, even though they appear in a ladies' paper, are worthy of the attention of practising architects. The idea at first seems strange, and is apt to be either decried or pooh-poohed, but when one looks around and sees what a number of women are engaged in the business and artistic pursuits of to-day the notion gains credence. To say that, because there are lady artists, so there may be lady architects is not perfectly justifiable, because no such practical duties are imposed on the former as on the latter, but that architecture as a profession for women will be largely adopted in the future seems highly probable, though the difficulties to be encountered will be many — not to say embarrassing in some circumstances.

FLANDERS—COMMERCE AND ARCHITECTURE—I.*

By JAMES LOCHHEAD, A.R.I.B.A.

"TRAVEL in the younger sort," says Bacon, "is a part of education," and to the architectural student the education, especially in the region of foreign travel to which we may presume Bacon refers, is or should be at once objective and subjective. The monuments of all countries, and more particularly those of antiquity, even if only on account of association, other than as evidences of intrinsic beauty produced by a bygone race, yield an amount of inductive information, and convey suggestion born of reminiscence even to the ordinary beholder who, if only in a superficial manner, analyzes, perhaps unconsciously, their import, and sees beyond and behind the emotions and story they betray, receiving his impressions in a general sense. He compares the past and present conditions relative to the buildings, their environment and their history, and creates an association of ideas which, like a meteor, revolve round the mere eye of memory, without encountering the atmosphere of reason and underlying principle, in which they would burst forth and illuminate the perceptions with the fuller light of truth and suggestion, which enables the architectural mind to "read, mark, and inwardly digest" the more ably. The man with an appreciation of architecture can, by virtue of his training, his knowledge of art history and his conception of the beautiful, realise some delights and derive some education from the study of monuments which are almost obscure to the ordinary observer.



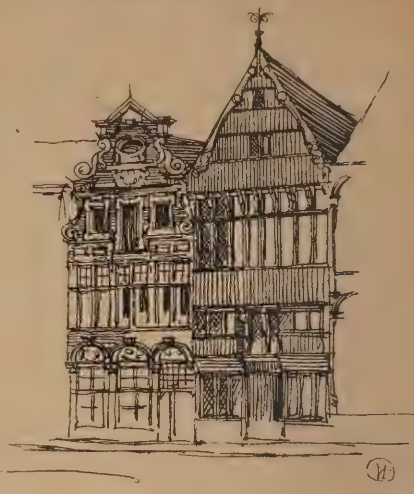
THE HOTEL DE VILLE, OUDENARDE.

What I mean by the educational results of travel will, I hope, appear clear in the sequel, and may not be enlarged upon here; but, meantime, I shall remark upon the means to the end, the method which assists the reason to analyse the better, the use of sketching, whether of the elaborate Pugin studentship type or mere wayside jottings and notes, and, in a less personal degree, photography. Sketching, by itself, is undoubtedly one of the most invaluable means of training eye, hand, mind and reason, but to my idea it is apt to develop too much into a means and create a desire for the purpose of amassing a collection of architectural features, "bits" or details, which one may consult and reproduce according as opportunity occurs, in part or in whole, on our buildings. To my mind there is something to be gained beyond this, and in associating the combination of circumstances, facts and history, together with the mere tangible expression which we wish to convey to paper, one may derive in a subjective way more real, if not also moral, education and ultimate good. "Architecture," says Banister Fletcher, in his history, "has often been too much isolated from its surroundings, and the main points of the physical geography, social progress, and historical development of each country require to be understood by those who would study and comprehend its particular style," and although there may be "some disproportion between our studies and our performances," we shall never understand the separate parts of the subject unless by a thorough, reasonable, and discerning study of the whole. The larger the buildings (and may I venture to say more particularly ancient buildings), and the more ambitious the study, the better; we get the architecture at its best upon which the most skilled workmen were employed, upon which the aspirations of the people were displayed, and in which the character of the nation was best reflected and most apparent for our edification.

I said at the commencement "foreign travel," and I did so advisedly, and with no attempt at disparagement of our own country as a field for study; only, in the latter case, the conditions and history which begat our national monuments are so well known, or should be, or so inadequately taken into account, that too much fancied familiarity has almost bred contempt for the considerations to be attached to the buildings. On the other hand, where such inherent, if badly applied, knowledge of facts and circumstances does not obtain such a hold on us, the ardent student is more likely to associate all the impressions and arrange them into such an order as will produce a definite result and effect upon his architectural reasoning, and cause a selection and rejection.

When this reasoning process of study is expended upon one particular phase of architecture, as it might evolve under certain distinctly marked influences and conditions racial, local, and political, it is more easy to discern the end in view than when varied conditions and motives existed.

Belgium, or rather Flanders, I venture to affirm, almost maintains a "splendid isolation" in the former respect, for it contains within itself an architecture which, if not original, is at least peculiarly expressive of the conditions which influenced it in its halcyon days of commercial and industrial prosperity. In order to reflect to the best of my ability the impressions which were produced by a recent tour, when, one of a party of eight with a united aim, I traversed the principal cities and towns of this famous dominion of Hanseatic sway, and attempted to study the elements of their glorious remains, it will be judicious to present them in the order in which they developed, by a series of impressions general and pictorial at first, architectural, comparative and associative afterwards, and at length and not least important, reflective.

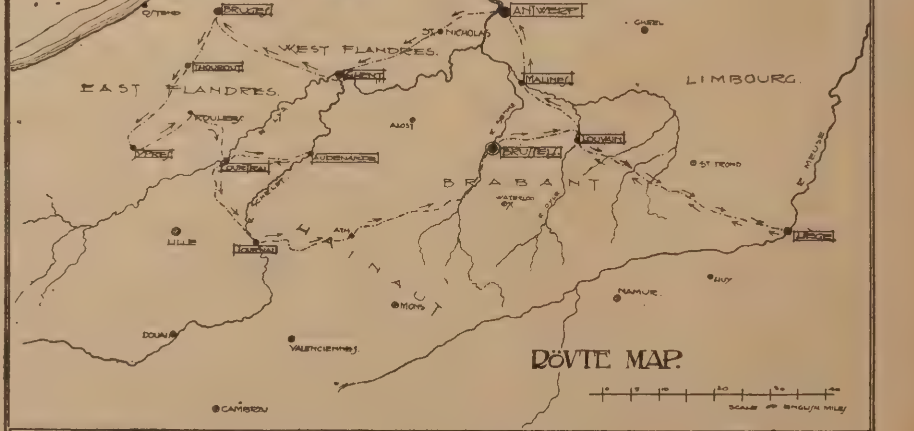


OLD HOUSES, MALINES.

As a general and pictorial impression, I shall review briefly the places visited, and neglecting the order of things as they appear *en route* on the map, roughly divide them into two classes with respect to that element which enters so largely into their being, their relatively past and present industrial prosperity—that is, the places "with a past" of great commercial and architectural activity contrasted with present lethargy, and those with a glorious past combined with a present activity—two possible divisions which impress one almost before anything else.

The former group may be said to contain most that is of interest, and comprises Ghent, Bruges, Ypres, Oudenarde and Malines; while the latter, including Antwerp, Brussels, Courtrai, Tournai, Louvain and Liège, are by comparison only of less interest.

Ghent—that is, the early portion—is essentially a place with a past, and it does not require the hackneyed expressions of a guide book to arouse the idea that it was once an important municipality, and one of the busy haunts of men who raised it to its once proud position of the chief manufacturing city in Europe; for its buildings bear upon them the impress of a departed glory, and a walk along its rivers and canals, once busy and active, now sluggish and almost deserted, on the banks of which, as will be understood, the story of its decline and fall is plainly written, but serve to confirm these sentiments, the proud gables now marking the scene of a changed life and telling the story of their ancient creators. To a very great extent Bruges partakes of this feeling; but the artistic joys and pleasures which exist in this glorious old town—as Longfellow puts it, "In the ancient town of Bruges, in the quaint old Flemish city"—a town which Grant Allen said was more interesting than any one thing in it, the delights of its quaint buildings "beside the still waters," apart from its municipal glories and the other internal evidences of its ancient wealth, destroy for the time all regrets, and subdue all moralisings on the transient nature of things material. It is a place full of continual and kaleidoscopic charm, and a very Eldorado for the artist—as one of our party expressed himself



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* A paper read before the Philosophical Society of Glasgow (Architectural Section) on November 26th, 1900.

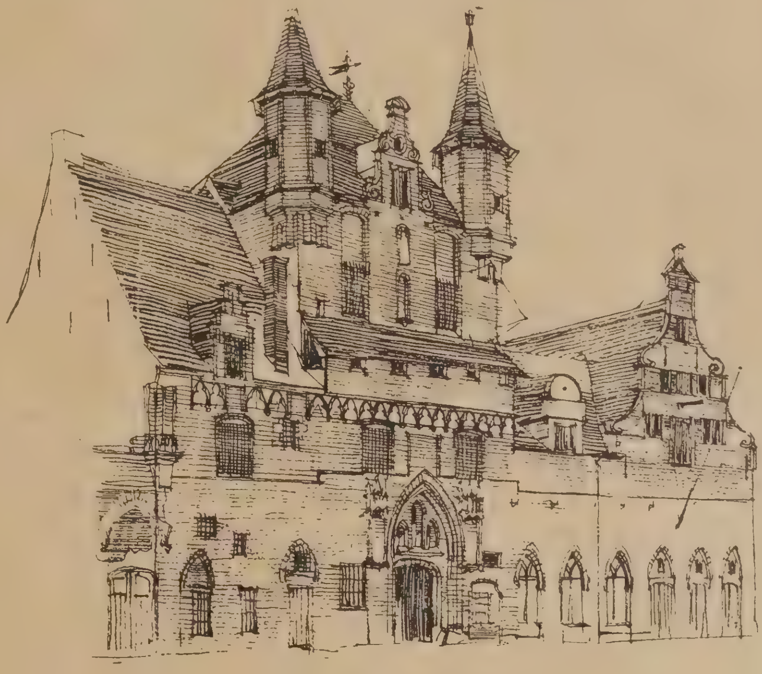
"there's no wonder they made painters here"! So much is one impressed with the life, variety and charm of Bruges, that the change to such sleepy and lethargic old places as Ypres and Oudenarde, and especially the former, that the lively chimes alone, "the melodious bells among the spires," arouse one from an inert attitude induced by the very oppression of the stately Cloth Hall whose silent eloquence fails even to rouse one out of the depths of pity and regret. This feeling finds an echo in the almost deserted squares of Oudenarde, only made vivacious to the mind's eye by the influence of the playful Hotel de Ville, or the picturesque banks of the Scheldt on which it stands, "remote, unfriended melancholy, slow," its fine church tower standing like a sentinel over the dreary and monotonous jumble of modern dwellings, which only serve to throw it out into bolder relief and majesty.

Only at Malines of these "departed shades" does one realise a little of the mediæval effect of some business activity, because although sleepy the town by virtue of its special industry permits the privilege of such an imagination, street, square and river alike being redolent of the industrious citizen, who, in the ofttimes quaint costume and noisy "sabots," assists the equally quaint and interesting structures in producing a peculiarly fascinating and old-world appearance. The contrast, however, architecturally and locally, betwixt such places as these and busy hives like Antwerp or Brussels or Liège is most marked. Antwerp, a thriving seaport and a tangled skein of animated streets, seems literally to hum around the base of its great cathedral, while here and there a stray gable of quaint outline, discovered in the midst of more assertive surroundings, betrays its connection with a bygone day. This old-world repose amid scenes and surroundings born of a later day is perhaps more manifest at Brussels, whose Grand Place with its peculiar and romantic guild houses standing "cheek by jowl" with its majestic Hotel de Ville, its pictorial Maison du Roi, and all that go to form what has been termed "the finest square in Europe," remaining in calm and revered antiquity—all went to mitigate the feelings of disappointment we were impelled to entertain with regard to Brussels as a whole, and which we exhibited by a hasty departure. Less disappointment results, probably on account of fewer expectations, at Courtrai, with its solitary belfry, left standing in the heart of a thriving population beside the lazy waters of the Lys meandering slowly in contrast to the town's industry; at Tournai, whose grand Romanesque cathedral dominates the city; and at Liège, which, reminiscent of Sir Walter Scott and the fortunes of Quentin Durward, maintains its Bishop's Palace there made famous, and a few less important testimonies of its ancient importance, and that amid a busy and active community. Louvain alone of these quasi-ancient and modern places rewards the architect to satisfaction and whether it be its Hotel de Ville, its churches, or its university—and there is much else of interest and excellence in the town—it tends to atone for the comparative architectural poverty of those cities and towns which constitute modern Belgium. I say "poverty" because the modern buildings for the most part exhibit a falling from the high estate attained by the erections of the past, although now under no less prosperous conditions. It is this that makes one marvel and involuntarily decide that a change must have enveloped the nation, the excellences of the evidences of whose commercial splendour have thus degenerated. History aids in suggesting the cause, and, as a writer remarks, is "one of those silent factors in the world's life, one of those iron keys which opens massive doors into still chambers, wherein strong men may look and wise men learn."

Flemish history fortunately possesses for our reflective purpose some salient epochs and features which influence the position and interests of the people very substantially and affect particularly its art. The social history of all nations is influenced by some marked epoch or power which moves its thought to its ultimate if temporary progress, and the history of Flanders is writ large with two great factors inseparably connected, those of independence and commerce, the latter a power, as Motley says, "the mother of Netherland freedom, and eventually its destroyer," a "good custom which corrupts the world."

The truth of Bacon's philosophy has, perhaps, no better proof than in the present case. "In the youth of a state," he writes, "arms do flourish; in the middle age of a state, learning, and then both of them together for a time; in the declining age of a state, mechanical arts and merchandise."

After the death of Charlemagne, the empire which he held together during his lifetime fell to pieces, and in the chaos which ensued the realm was divided, subdivided, and at times partially re-united like a family farm among incompetent monarchs, into shreds and patches of sovereignty. In this condition a series of forces acted upon the movements of society, and in the order of those activities which constitute human life—that which ministers to self-preservation first manifested itself, and "the power of iron" asserted and exerted itself in a struggle for supremacy between the isolated states. This was succeeded by the force clerical, the power of priesthood, "the might of educated mind measured against brute violence," which became as potent as the sword, but less so than the power of gold or the force of commerce, which came next, and, developing itself more slowly, changed insensibly and miraculously the aspect of society.



THE HALLES, MALINES.

The genius of Liberty conducted by the spirit of Commerce descended upon the alienated states, and the counts, recognising the spirit of self-government, stimulated by this isolation and the prosperity of the country, anxious to increase their own importance, granted privileges to their communities, who, thus formed into half-independent states under their own counts, organised and inspired with the breath of civic life, assumed the appearance of prosperous republics.

The Hanseatic League, that trades-union of the thirteenth to the fourteenth centuries which existed in North Germany and Flanders, and had for its device "Freedom for the common merchant at home and abroad," contributed by its formation of trade guilds, together with the influences and passions at work within the communities, to the production of those evidences of prosperity and national life which are portrayed in the architecture of Flanders, and brought the influence—artistic and social—of various countries into contact. These then were the historical influences, thus very broadly expressed, which marked the architectural expression of Flanders.

It is difficult to gain an idea of the full extent and nature of mediæval trade, but this was far more rich and varied than we suppose; and all the evidences we have of the wealth and luxury are in the remaining monuments of the time, and, happily, these are plentiful.

We know by these and other artistic treasures that art flourished, but it is the art of a purely commercial people, for, as exhibited in the pictures of the times, to quote Grant Allen, for the most part "they are portraits of solid and successful merchants, or the devotional works which a merchant donor presented to the patron saint of his town or business."

The architecture, on the same principle, is a strictly municipal architecture, expressive of the communities themselves. The belfries are primarily a mark of independence, and a means of summoning the citizens to arms, while the town halls presided over by the councillors chiefly chosen from the leading merchants, as a meeting place of the burghers, represent the wants of the communities themselves.

These were the centre of all national life, the market-place was built round them, around were the chief shops, and chief among these the cloth halls where the Flemish cloth and linen, the staple manufacture, found buyers from every European market, while the guild houses of the different trades, whose interests were protected by the League, afforded means of inter-communication and conference, where

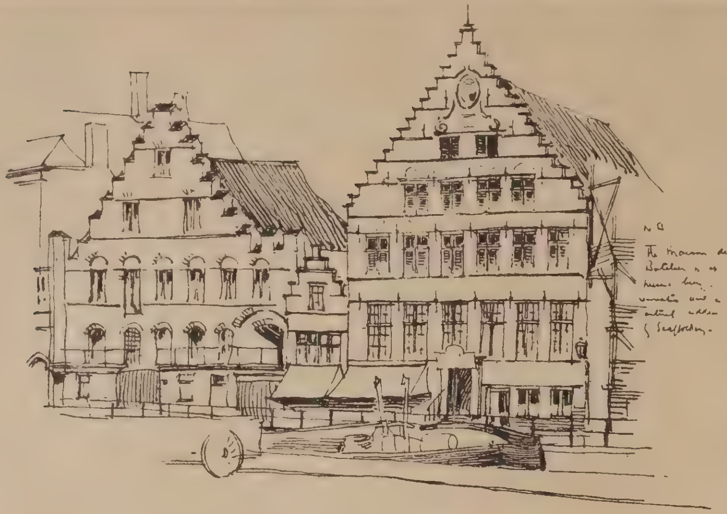
> "Lombard and Venetian merchants with rich-laden
> argosies,
> Ministers from twenty nations,"

might assemble and possibly reside at times in the lordly town mansions of the opulent burghers. These "town halls and markets," says Ferguson, "and the residences of her burghers, still display a degree of taste and elegance unsurpassed by anything of the age, and remain to this day the best index of the wealth and independence of the communities to which they belonged."

In addition to this, and apart from them as evidences of commerce, the churches and religious buildings, many of which survive to this day, amid surroundings to which they have grown strange, speak more eloquently of the Hansas' might than piles of old parchment records, as they point to the church as the one converging point of ideal life.

Following this order, the architecture as a direct outcome of the commercial spirit, and especially the civil and domestic architecture in which Ferguson declares "Belgium surpasses all the rest of Europe put together," can be well illustrated in the sequence which the same authority adopts, namely of belfries, town halls, guild halls and churches.

As already stated, the belfry was the earliest architectural expression of newly-acquired freedom, and the right of having a bell was one of the first privileges granted in old charters, not only as a symbol of power, but as the instrument for calling the communities together either with arms in their hands to defend their walls, to repress internal tumults, or for the election



GUILD HOUSES, GHENT.

of magistrates and deliberation on the affairs of the commonwealth.

The tower was generally the record office of the city, the place where the charters or more important deeds were preserved.

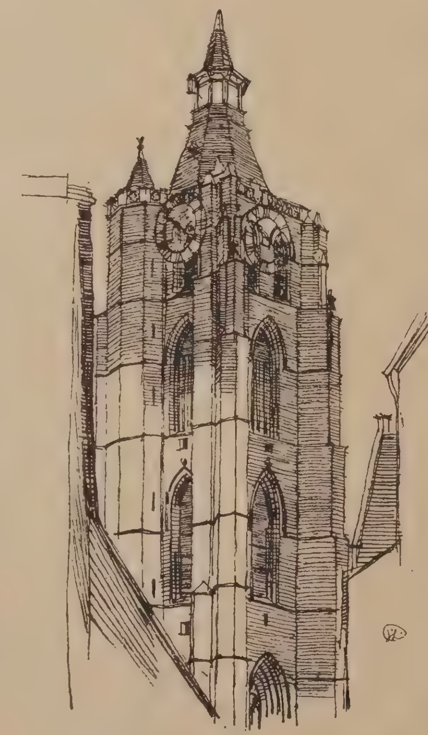
Now, the original use has ceased to be, and the sole remaining joys consist in the pleasures of a contemplation of their ofttimes graceful proportions, and listening, like Longfellow at Bruges,

> "To the chimes that through the night
> Rang their changes from the belfry
> Of that quaint old Flemish city."

The town halls present a "glorious company" of rich and expressive buildings existing to this day, and that in a splendid and carefully ordered preservation; they reflect, as none else of the edifices do, the wealth and luxury of Flanders. True, a similarity of style pervades them, and a redundancy of ornament might be laid to their charge, but the result is peculiarly satisfying. In some parts the detail is coarse, but the application of ornament for the most part is in such good taste that we forget to criticise the defects; and even if "the crowd of statues, in whose folded sleeves birds build their nests," are often modern or hard, and not always in perfect harmony with a civic building, they serve to add life and additional interest. Where they exist in the same cities the trade or cloth halls bear a well-marked distinction from the town halls, being for the most part in keeping with their purpose, less ornate, and more reposeful and reticent in effect; and, as if in direct courtesy to the various commercial peoples with whom trade was conducted, in some cases they bear unmistakable evidence of foreign architectural influence. The Cloth Hall at Ypres is a building which all of us know by repute, and to those who see it for the first time the eulogies passed upon it are thoroughly appreciated. It seems to rise at you, so to speak, and assert itself, while its mass, though dominating everything in the neighbourhood, even to the adjoining cathedral of St. Martin, is not unduly aggressive. The smaller hall at Bruges, incorporated with the belfry, with its evidence of Italian influence, the quaintly picturesque building at Malines, and the over-restored one at Ghent, all exhibit elements of architectural expression so lucid that he who runs may read. It is unfortunate, on the other hand, that the interiors are as uninteresting as the exteriors are instructive, and on this account a certain amount of architectural aim is lacking.

Like the cloth halls, the guild halls, or meeting places of the various trade guilds or associations of merchants, are at once conspicuous and interesting, even withal the "base purpose" to which they have in some cases descended, and left them, if not in ruins, in the hands of vandals. It was however satisfactory, although our misfortune in one respect, to see the beautiful House of the Skippers at Ghent in course of restoration—a process, let us hope, which stopped at the proper stage, and did not proceed to the extent of gilding which has spoiled the otherwise interesting facades of some other guild houses. In the later Renaissance work these houses exhibited an undesirable amount of bizarre and overlaid decoration, as at Brussels, only relieved by the evident desire to mark their individuality, a purpose accomplished in some cases in a very grotesque manner, hardly worthy of emulation or even admiration. Invariably these buildings were, to use a Scotticism, "gable enders," that sensible architectural means of utilising limited space; and while they bear no special indication—save, perhaps, in the one instance at Brussels—of the particular trade on whose interests they were erected, they bear on the face of them evidence of being something more than mere habitations. Their peculiarly Flemish gable outline, and, where situation and environment permitted, their picturesque grouping, testify to the artistic taste as well as the considerate unselfishness of the builders; for if they had proceeded on the merely utilitarian principle nowadays too prevalent, an amount of selfish obtrusion would have suppressed the joy of beholding thought and care bestowed on others in the erection of a "thing of beauty" for themselves.

No less interesting and expressive are the private houses of the traders or principal tradesmen; and from the Maison du Roi down to the humble or aspiring merchant's domicile the abodes are not over suggestive of wealthy magnates, while each displays that mark of individuality and distinction the lack of which too often robs domestic work of the interest which it is essentially capable of affording. The fact of these dwellings being existent in the towns, close by and identified with the businesses which constituted their owners' interests in life, contributes to the pervading sentiment as equally well expressed in the places of business themselves. Fronts of unique and quaint design constantly meet the eye, in few cases obtruding themselves in the way which vulgar or over-ornamented buildings never fail to do. Although hardly rising to the grade of specimens of fine art, when grouped together in the narrow winding streets, or along the banks of the canals, the result is so varied and charming that we are inclined to ascribe to them more intrinsic beauty than they really possess as individual designs. Most of them are of brick; and using the brick undisguisedly, and depending wholly on such forms as could be given to the material, they never offend our taste by shams, and the endeavour of the citizens to ornament the dwellings externally meets with the success that must always follow such an attempt. When the shapes have been varied to admit Gothic tracery, and the openings fitted ingeniously into them, with the iron-tie ends of clever and appropriate design introduced over the front as construction necessitated, the effect is often extremely pleasant and graceful.



CHURCH OF NOTRE DAME, MALINES.

Apart from the evidences of trade and commerce and prosperity exhibited in these buildings, the evidences of wealth and luxury can also be found in the churches. "Everything that went beyond the immediate practical needs of daily existence, every form of charity, every endeavour after culture, every striving of artistic and scientific activity, had in these days a religious foundation." "In the vast number of cities, towns and villages," remarks Motley, "there has been a vast accumulation of ecclesiastical wealth." That this has been lavished upon the ecclesiastical edifices is proved by the existence of some of the grandest cathedrals and churches that the Middle Ages witnessed. Ferguson declares with his usual emphasis and dogmatism that the Gothic architecture of Belgium is in many points scarcely inferior to that of France. In and at Ypres, with its well-preserved church of St. Martin; Oudenarde, whose massive tower of St. Walburg dominates the surrounding cluster of dwellings; Malines, and its great and dignified cathedral; Antwerp, whose industry throngs at the doors of its picturesque church, and worthy habitation of Flemish art; Brussels, whose cathedral, Durham-like, contemplates the ceaselessness of that gay capital; and, in fact, in every city and town in Belgium there exist proofs that the tendencies of the people did not all run to civic monuments, and their architectural charms are heightened by their being the sacred custodians of paintings, representative of the art of Flanders, whose perfection was only equalled by the enthusiasm of its votaries.

When the great building age had passed, and the great and subtle change produced by the Renaissance had set in—a phase which to a great extent is outside, except for a moral and reflective purpose, the scope of this paper—we see also practically the end of this distinctive architecture. We do not lose sight, however, all at once of the activity and motives of the people, for, as if by the result of their previous endeavours, the new phase did not lose that earnestness which characterised the old and the early examples of a transitional and classic architecture, showing a fusion of endeavours and taste in obeying the irresistible demands of the great voice which spoke throughout Europe. If at first these showed to a degree considerable refinement and grasp, here and there displaying an excellent interpretation of the new style, the internal canker of the states and country gradually manifested itself externally by a slow but sure change to the impoverished architecture of a later day.

In a contemplation of these buildings, then—and an endeavour to penetrate behind and beyond the mere superficial evidences such as I mentioned at the outset might tempt one to put on mental record mere parts of the whole—by reason of certain tangible and attractive merits one's reflections partake of the nature of an evolution, at first touching upon the purely objective impressions without any attempt at association, and gradually working round to and identifying themselves with the subjective impressions intimately connected therewith, which will be found to comprise the ideas artistic, historical and social.

A writer in the BUILDERS' JOURNAL affords a well-expressed clue to such impressions. "It needs," he says, "no subtle power to read from the building the character and temperament of its designer. You may see good sense in the use of material, clearness of head in the simplicity of the plan, a well-balanced mind in the disposition of the masses, courage in the breadth of the wall spaces, imagination in the treatment of a skyline, wit in the contour of a moulding, and humour in an unexpected piece of carving—or miss some or all of these qualities as the case may be."

(To be concluded.)

OBITUARY.

THE LATE MR. BRYDON.

WE very much regret to announce the death of Mr. J. M. Brydon, a vice-president of the Royal Institute of British Architects, which took place, after a short and painful illness, on Saturday morning, May 25th.

Mr. Brydon was born in 1840 at Dunfermline, and there he received his education. At the age of sixteen he went to Liverpool to enter upon an architect's career. He then served under the well-known architects Mr. Bryce, of Edinburgh, and Mr. Campbell Douglass, of Glasgow, and finally he joined the staff of Messrs. Shaw & Nesfield, London. When he felt that the time had come to start professionally in his own name he devoted himself at first to the designing of furniture. But this sphere speedily proved too narrow for his powers, and he found further scope in domestic architecture. Mention may be made in this connection of the country house "Lewins" which he built for Mr. Joseph Robinson, in Kent, and of the extensive alterations to the Château of Buillon, near Besançon, the country seat of the famous artist, M. James Tissot. It was, however, in the design and construction of public buildings that Mr. Brydon excelled and on which his reputation chiefly rested. He was an ardent student and exponent of classic traditions in architecture, and paid a number of visits to Italy with a view to extending his knowledge in this direction. The first works that brought him into special notice were the library, the polytechnic, and the additions to the town hall of Chelsea. His name is prominently associated with the town of Bath, for which he built its guildhall, its Victorian Art Gallery, its technical schools; and the extensions of the pump room. Mr. Brydon also restored the ancient Roman baths there, and by his sympathetic and masterly treatment not only incorporated all that was possible of the ruins, but imparted an air of antique dignity to the new work that has called forth great praise. The work in Bath occupied him about eight years. Other public buildings of his are the women's hospital in Euston Road, the medical schools for women, Hunter Street, and the hospital for stone, Henrietta Street, Covent Garden.

The great work in which Mr. Brydon was engaged at the time of his death was the construction of the new public offices for the Local Government Board and Education Department in Whitehall. He was selected for this important task out of a number of leading architects whose names were submitted to the Government by the Royal Institute three years ago. As yet only the foundations have been laid, so that the guiding mind has been removed just when it had begun really to grapple with the vast undertaking. After being chosen to construct these Government buildings, Mr. Brydon was selected to participate in the limited competition for the rebuilding of the Old Bailey.

Mr. Brydon had been on the council of the Royal Institute of British Architects for a number of years and took a leading part in the work of the Institute; and he was a learned and enthusiastic member of the Art Standing Committee. Although a very busy man he found time to read many papers both at the Institute and elsewhere. He was a man of wide interests and strong opinion, expressed always with geniality and humour, a good talker, and a very pleasant stimulating companion. He will be greatly missed both in the profession generally and in the councils of the Institute. He was buried at Highgate Cemetery on Wednesday last. In the issue of the BUILDERS' JOURNAL for March 12th, 1895, appeared a "Men who Build" article dealing with Mr. Brydon's work.

GABLE ENDS, BRUGES.

THE WONDERFUL PALACE OF KNOSSOS.

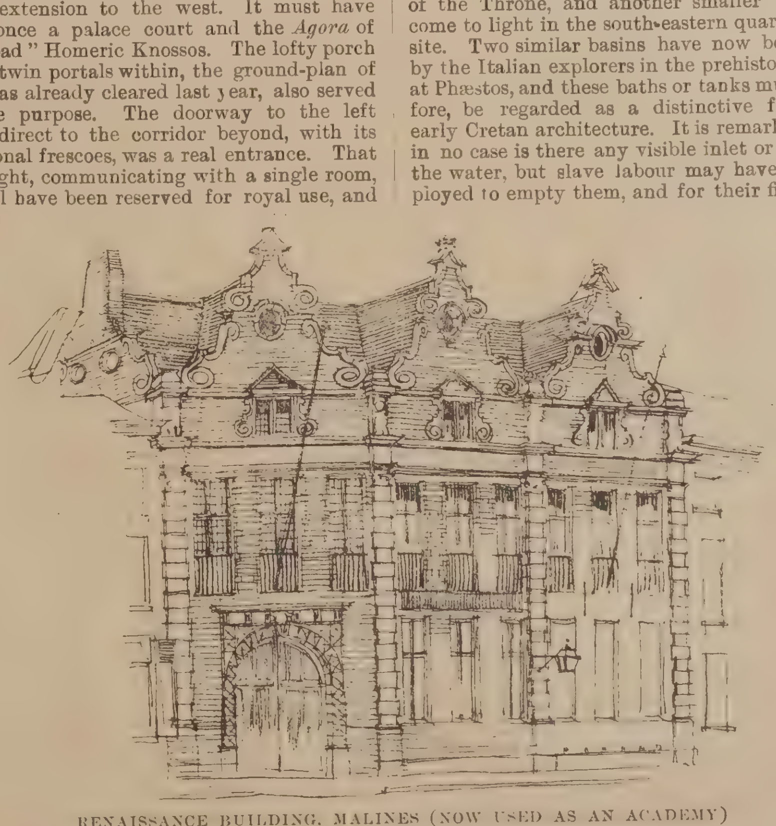
FRESH DISCOVERIES.

IN our issue for November 7th, 1900, accounts were given of the wonderful discoveries made in Crete by the well-known archæologists, Mr. A. T. Evans and Mr. D. G. Hogarth. Mr. Evans has now made public through the medium of the "Times" some particulars of fresh discoveries in the Palace of Knossos. He says:—

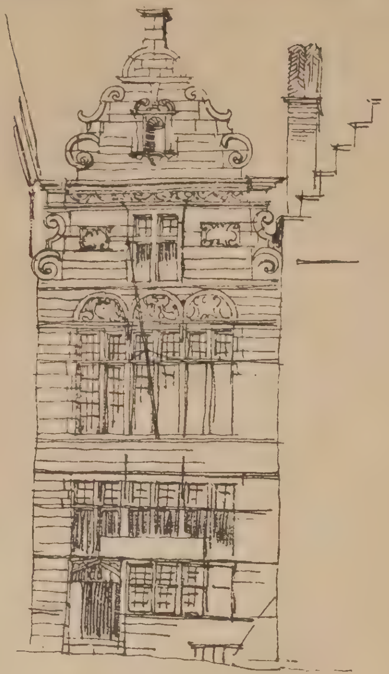
Thanks to the liberal contributions received from the Cretan Exploration Fund, it has been possible for me to resume the excavation of the great prehistoric building of Knossos—the true "Labyrinth" of ancient tradition—on an adequate scale. The season's work is now so far advanced that a short summary of the results—in many respects not inferior to last year's discoveries—may be of general interest. It is now evident that the palace is of even vaster extent than could have been foreseen from the long lines of outer walls already brought to light. The great entrance court takes an almost unlimited extension to the west. It must have been at once a palace court and the *Agora* of the "broad" Homeric Knossos. The lofty porch with its twin portals within, the ground-plan of which was already cleared last year, also served a double purpose. The doorway to the left leading direct to the corridor beyond, with its processional frescoes, was a real entrance. That to the right, communicating with a single room, may well have been reserved for royal use, and it is natural to imagine the king here, seated at the gate in the Oriental fashion and giving judgment before the assembled people in the *Agora* beyond.

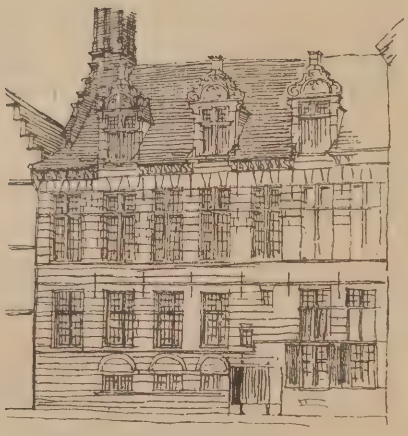
A Piazza and Baths.

The base and foundations of the west wall of the palace were found to continue northward, taking finally a double turn eastwards in two sharp finely-preserved angles. The foundations themselves are on this side composed of small blocks—apparently unique in structure—and inner lines of the same construction, which support part of the north-western area of the building, attain the surprising depth of 23ft. The outer wall, after its turn eastward, takes a further and quite unexpected turn to the north, enclosing a distinct quarter of the palace grouped round a small paved piazza with an inner portico of its own. This piazza, already partly excavated last year, was found to give access on the west to a spacious bath or tank, lined with fine gypsum slabs nearly 7ft. in height and approached by a double flight of steps flanked by a breastwork and columns, of which the bases only remained. The basin is analogous, but on a larger scale, to that already found in the Room of the Throne, and another smaller has since come to light in the south-eastern quarter of the site. Two similar basins have now been found by the Italian explorers in the prehistoric palace at Phæstos, and these baths or tanks must, therefore, be regarded as a distinctive feature of early Cretan architecture. It is remarkable that in no case is there any visible inlet or outlet for the water, but slave labour may have been employed to empty them, and for their filling, too,



RENAISSANCE BUILDING, MALINES (NOW USED AS AN ACADEMY)





THE CONCIERGERIE, YPRES.

so far as it was not effected by the supply of rainwater from the housetops.

Magazines.

A terrace wall divides this northern region of the bath and piazza from a considerable interior area of the building that lies between this and the zone laid bare by my last year's excavations. In this area, which includes the whole north-western angle of the palace, have now been uncovered a further series of large magazines opening on the Long Gallery already discovered. These freshly-excavated magazines are ten in number, bringing the whole tale up to eighteen, and several of them proved to be exceptionally rich in their contents. In the southernmost of these the huge store jars stood in double or single rows in unbroken order from end to end of the long chambers. Interesting evidence was forthcoming of the existence of at least one upper storey above these magazines, and on the upper floor level were found fragments of painted vases in a style which for combined beauty and largeness of design surpasses any known ceramic fabrics of the Mycenæan age. Near the north-western angle of the wall, and also certainly belonging to the upper storey, were found various remains indicative of the former existence of an important feature of the building at this point. Here was found a continuous piece of stone frieze, or dado, with triglyphs and half rosettes in relief, together with other architectural fragments. Here, too, fallen from the walls, were parts of fresco paintings containing in their original design a series of zones with human figures from about a fourth to an eighth of the natural size and of special interest as supplying a wholly new version of the costumes of Mycenæan Crete.

Of contact with Egypt a highly important monument has come to light, dating from about the same period—the early part of the second millennium B.C.—as the diorite figure found here last year. It is the lid of an alabaster vase very finely engraved, with a cartouche containing the name and divine titles of Khyan.

This lid lay beneath a later Mycenæan wall and floor level, and it is perhaps not an accidental coincidence that about three yards from the same spot there came to light a fine Babylonian cylinder of lapis-lazuli mounted with gold and representing mythological subjects. It seems to be of pure Mesopotamian fabric belonging to the class that supplied the immediate predecessors of certain "Hittite" types of Northern Syria. This is, I believe, the first authentic instance of the discovery of a Babylonian cylinder in the Ægean world.

The Northern Entrance Way,

partly excavated last year, was found to descend to a much greater depth, and fine walls of masonry, showing as much as eight courses, have here been exposed to view on either side. To the east of this and of the great court on which the Throne Room and other chambers open a further extensive palace region is now coming to light. These remains extend to the south side of the same court, which is now seen to be a spacious interior piazza. The buildings on the east side of this court include a series of small magazines, where considerable stores of plain clay vessels of various kinds lay in piles and nests.

The Palace a Town.

It becomes more and more evident that the Palace of Knossos, like Indian palaces at the present day, was a small town in itself, with a considerable population of slaves and artisans, who were employed on various arts and industries for the benefit of its lords. Various indications point to the fact that many of the beautiful *intaglios*, the clay impressions of which have occurred here so abundantly, were produced by engravers working within the building. In several chambers were found the paints and pounded gypsum used by the artists who executed the noble frescoes and reliefs that adorned the walls. In a room on the brink of the eastern slope was made a discovery that shows that the sculptor's art also flourished on the spot. Here was found a magnificent three-handled "amphora" of veined marble-like stone, with spiraliform bands and reliefs round its mouth and shoulders, of such calibre that it took eleven men with ropes and poles to remove it from the site. This fine work was complete, but beside it stood another smaller vase of the same material and general outline, but only roughly shaped out. The sculptor was apparently at work on it at the moment of the destruction of the palace.

A Remarkable Discovery.

Above this *atelier*, on the floor of a larger chamber, a find of a truly surprising character was made. Detached pieces of ivory and crystal began to appear, which were found to belong to a large board more than a yard long. It had been somewhat crushed and contorted, but the chief component parts were still in their places, though lying on the loose earth; and by means of framing and underplastering it was possible, after nearly three days' careful work, to get out the whole as it lay. In the magnificent object thus recovered we have undoubtedly the royal draught-board. The framework was of ivory perhaps originally supported on wood, the board having perhaps also acted as the lid of a box to contain the men. The surface of the board formed a kind of mosaic of ivory, partly coated with gold, and crystal bars and plaques backed with silver and blue enamel—the Homeric Kyanos. At one end was a series of medallions arranged like those of the Egyptian draught-boards, such as that found in the tomb of Queen Hatshepsut, already known from the Enkomi example to have been imitated by the Mycenæans. This is followed by a kind of labyrinth of ivory and crystal, to which again succeed four large elaborately-jewelled medallions and nautiluses of ivory and crystal. The whole was enclosed in a frame of marguerites in relief wrought in the same materials.

Among the most interesting discoveries of the present season have been the large number of clay impressions of Mycenæan gems and signet-rings—some of them used for securing the boxes in which the inscribed tablets were originally deposited. The subjects of some of these are of striking novelty, such as a lady with a swallow at the end of a string, which seems to be serving as a lure to another swallow flying towards it. But what are we to say to a creature with the forepart of a hoofed, calf-like animal, and the legs of man, seated on a kind of throne? If this be not the Minotaur, it is surely the Minocalf. That the local monster of the later Greek legends should thus have received illustration in Mycenæan times is a strange and significant phenomenon.

The Scene of a Shrine.

Excavations just south of the Throne Room on the western border of the central court have brought to light other interesting seal impressions, several of them with religious subjects, which tend to show that there was a shrine in this vicinity. From a series of more or less fragmentary impressions it has been possible, indeed, to put together a whole scene of ancient worship, in the centre of which a goddess akin to the later Rhea or Cybelê stands on her sacred rock guarded on either side by heraldically posed lions. In front of her is a votary in the act of adoration, while behind is a small temple with two consecrated pillars. The broad steps that ascend from the Central Court near the spot where the seals were found seem to have led to a spacious "Megaron", or hall, resting on basement rooms, into which part of its original pavement had fallen.

Wonderful Sculpture.

At the south end of the same central court remains are at this moment coming to light which show that on this side, too, rose a hall adorned with painted reliefs of human subjects.

GABLE ENDS, YPRES.

An admirably modelled thigh and leg of a man, and an arm and breast, perhaps belonging to the same figure, must certainly be taken to represent the highest level ever reached by Mycenæan art. There is, as usual, a tendency somewhat to exaggerate the muscular display, but the human form is here seen as it was never again portrayed till the greatest age of Greek sculpture some ten centuries later. In this brilliant combination of the modeller's and painter's skill we may recognise the masterpieces of the craft associated with the legendary name of Daedalus. Round the breast and shoulders is a kind of chain of honour. the alternate links of which take the form of lilies; but another fragment supplies insignia of still more royal purport. It displays the upper part of a head wearing a crown which terminates above in a row of five sloping lilies of varied metal-work, with a higher one rising erect in the centre. That the *fleur-de-lis* of our Edwards and Henrys should find a prototype in prehistoric Greece is a startling revelation; but it was perhaps fitting that, as last year's excavations in Knossos brought to light "the oldest throne in Europe," so the more recent researches should produce its most ancient crown.

NEW LIVERPOOL CATHEDRAL.

THE OPINION OF MR. GEORGE BRADBURY.

THE Liverpool Cathedral question, of which particulars have been published in these columns from time to time, is again to the fore, and is now attracting considerable local attention. Mr. George Bradbury, diocesan surveyor, past-president of the Liverpool Architectural Society, and the architect of Church House, has expressed the following opinion:

In selecting a site for the new Liverpool Cathedral I think the following points should be carefully considered.

(1) That it should be placed upon a site a little apart, away from the noise, dirt and bustle of the heavy traffic of the Liverpool streets.

(2) That it should be as near the centre of the city between north and south as possible. The north of Liverpool I take as the boundary of Bootle, and the south including the whole of Garston, for, whether that district is incorporated with Liverpool or not, it is really part of the city, and very extensive building operations are going on there.

(3) If a portion of the cathedral is to be built within the next twenty years the question of the cost of the site is a most important one. If the committee have to spend £150,000 to £200,000 in purchasing buildings, then all the money at present subscribed and for the next few years would probably be expended without the laying of a single stone.

(4) The question of foundations. The cathedral should be built on the rock, so as to properly sustain the high towers or spires, and avoid the disasters that have befallen so many of our ancient cathedrals by the towers and spires falling and destroying large portions of the transepts and naves. The cost of foundations in the lower parts of the city would be something enormous.

(5) The question of architectural effect. And as this is one upon which there may be great difference of opinion I do not think I can do better than quote from the highest possible authority. Mr. Ruskin, on the subject of building on sloping ground, says: "The fact is that the apprehension of the size of the natural objects, as well as of architecture, depends more on fortunate excitement of the imagination than on measurements by the eye, and the architect has a peculiar advantage in being able to press close upon the sight such magnitude as he can command. There are few rocks even among the Alps that have a clear vertical fall as high as the choir of Beauvais; and if we secure a good precipice of wall or a sheer and unbroken flank of tower, and place them where there are no enormous natural features to oppose them, we shall feel in them no want of sublimity of size."

TONLIEU OR CUSTOM HOUSE, BRUGES.

From notes that have appeared in the papers I understand the committee are considering three possible sites: St. Luke's, Bold Street; Monument Place, London Road; and St. James's Mount, Upper Duke Street; and a Mr. Robert Gladstone appeals with confidence to every architect in Liverpool to confirm his opinion with regard to St. James's Mount, I have ventured to lay before you a few facts with regard to the above situations.

St. Luke's Church site has a length, from the steps to the wall in Roscoe Street, of 290ft., with a breadth of 170ft.; it would be too small for a cathedral unless six houses in Rodney Street were purchased, when the site would then have a length of 480ft. by a breadth of 170ft. Judging this site with regard to its quietness, it is exceedingly bad; tram-lines run on two sides almost incessantly, including Sundays, and the traffic is something enormous. The church originally had an exceedingly handsome oak timber roof, but subsequently, owing to the very defective accoustic properties, the internal plaster groining was placed below.

This site cannot possibly be considered as a quiet spot. It is well in the centre of Liverpool.

With regard to the cost of the minimum site, it would probably amount to £20,000, without considering the question of the vested rights of the incumbent or the trustees, and without buying the land up to Roscoe Street.

No doubt good foundations could be obtained if the present St. Luke's were entirely removed, but it would be very difficult to obtain proper levels. If the chancel were put on a level with Rodney Street, the fall to the top of Bold Street would be something like 40ft. I cannot think that public opinion would ever allow the handsomest church in Liverpool to be pulled down and removed; it cost about £60,000, some say £80,000, of public money to erect, and I think it should be left as it is to carry on its enormously successful parish work. And, as a whole, this church has a fine architectural effect, and on that ground it would be a great pity to have it removed.

I have traced from the ordnance surveys the three sites mentioned; they are all to the same scale, and upon each I have placed the design which, I understand, was placed first in the competition held for the Liverpool Cathedral in 1886. All the plans sent in at that time gave a cathedral approximately 450ft. long by 230ft. across the transept. Unless the property on the south side of Bold Place, extending to Roscoe Street, and an additional seven houses in Rodney Street, as well as the new property in Berry Street, were purchased, the cathedral as designed by the competitors could not be placed upon St. Luke's site without very seriously curtailing its length and breadth, and the purchase of all the above property, which would probably amount to £130,000, would render it an impossibly costly site, even if the vested interests, dirt and noise were not taken into consideration.

Monument Place site has a frontage of about 130ft., and, at the back, a width of about 370ft., and from front to back a depth of about 480ft. The site cannot possibly be considered "a quiet place"—the electric trams, the noise of the traffic, would make it almost impossible to hear anything of a cathedral service. Only those who live in houses facing on to a road where the electric cars run can really estimate the noise they cause. On the question of cost this site, in my opinion, would involve the expenditure of £130,000 in land and buildings, and a further £50,000 as trade compensation—total, £180,000 at least. A comparatively new bank, large business premises, valuable shops and a church would have to be removed. The foundations no doubt would be found satisfactory.

With regard to the architectural effect, it could be seen on three sides, and would have a very imposing appearance, but, owing to the large amount of very small property with which it would be surrounded, it is doubtful whether the week-day or Sunday services conducted in that district would be largely attended by those who are able to support cathedral services.

The same cathedral plan very nearly fills the Monument Place site, and future extension for houses of residence would become very costly; nor is this a neighbourhood where we could reasonably expect our archdeacons or canons to reside. For the reason therefore of the noise and the enormous cost of the St. Luke's and Monument Place sites, I think they are both entirely unsuitable.

St. James's Mount has till quite recently been considered quite unsuitable, except in connection with St. James's Cemetery. It is not at all necessary that the early ideas of building a bridge across the cemetery to Hope Street, or putting the cathedral upon huge arches, should be considered. St. James's Mount is in itself sufficiently large to admit a cathedral without even disturbing the boundary railing of the cemetery, or the mortuary chapel, nor need a single grave or stone be disturbed. The dimensions across the site at its widest part are, as given by Mr. Gladstone, about 248ft., with a length of 1,020ft.

HOTEL DE VILLE (LATE PORTION), GHENT.

There are only six houses on the Mount of any size. The other three are merely small cottages or a lodge. The houses could probably be bought for a comparatively small sum. This site ought, therefore, to be acquired, with all the houses upon it, for about £20,000; and this sum, compared with the cost of other sites, ought not to prevent the commencement of the erection of a cathedral within a very short period.

From a very careful survey I have made of the cemetery, I think the original rock would be found at a reasonable depth below the surface of St. James's Mount. Wherever the cathedral is built, the spread of the foundation walls will necessarily cause them to have to be carried down a considerable depth. The cost of the foundations of this site would probably be far less than of any other site in Liverpool. The walls would stand upon the solid undisturbed rock, and in this way there would be no danger of any accident in the future.

The architectural effect, as regards situation, would, in my opinion, quite equal, if it did not surpass, anything we have in England. The cathedral would probably stand on a perfectly level platform about 13ft. above St. James's Road, at its north end. The nave floor would, therefore be about 150ft. above the level of high-water mark, and about the same level as

Hope Street, facing Gambier Terrace. The view of the cathedral for the whole length of that part of Hope Street, viewed across the pretty hollow of the cemetery, would be something almost unique in England, and of great magnficence.

It would stand in an open space nearly a quarter of a mile long by 200yds. wide, and in my opinion Mr. Ruskin must have had such a site in his mind when he wrote the words quoted at the commencement of this letter. The St. James's Mount site is, in my idea, the only one in the whole of Liverpool that meets the conditions of a Liverpool Cathedral.

NEW BOARD SCHOOLS AT CRADLEY.

NEW Board Schools are to be erected at Colley Gate, Cradley. The tender of Messrs. H. Dorse & Co., Cradley Heath, the contractors, is for £3,970. Messrs. Meredith & Pritchard, of Kidderminster, are the architects. The Colley Lane schools are to be erected upon building sites on the north-east and south-west sides of Colley Lane, and are designed to accommodate 190 infants and 240 girls. The school on the north-east side of the highway is for infants, with approaches from Colley Lane and also from the Ragged School Lane. The arrangement of this school consists of wide tile-paved corridors and lock-up cloakrooms, enclosed with metal lattice screens, with accommodation both for the scholars and the teachers, and with the most recent lavatories. The rooms, each of which opens directly from the corridors, consist of schoolroom 34ft. by 24ft., classroom 22ft. 9in. by 20ft. and babies' room 22ft. 9in. by 20ft., the whole with wood block floors, pressed brick dados and plaster ceilings with carved wood trusses. The girls' school, which is placed on the south-west side of Colley Lane, has similarly designed corridors, cloakrooms and lavatories as the infants' school, with two classrooms, each 30ft. by 22ft. and two 24ft. 4in. by 24ft. 3in., three of which are capable of being thrown into one by patent movable partitions, forming a room 84ft. 4in. long. Both schools will be well lighted and ventilated, and warmed by the latest low pressure system on the American radiator principle. Large playgrounds are provided for both schools, and have the most modern sanitary appliances. Both plans have been designed for and show how future extensions may be made when required, and the cloakroom accommodation for the extensions is provided in the plans now decided to be carried out. The original design of the architects for the elevations was of rather an imposing character, but the estimate of £4,670 was considered by the Board to be more than ought to be spent, and the architects were desired to cut out all ornamentation and keep the cost below £4,000. This has now been done.

John Milton's Bust, by Mr. Frampton, which is to be placed in the Cripplegate Institute, is not the only memorial of the illustrious poet to be found in this parish. In the church of St. Giles, where, with his father, he lies buried, a bust was erected as long ago as the year 1793 by Samuel Whitbread, the friend of Sheridan, and there is also a monument, by William Benson, to be seen in Westminster Abbey. Daniel De Foe, a bust of whom is also to be placed in the same institution, was born in the parish of St. Giles.

The Registration of Architects.—A meeting of architects, convened by the council of the Society of Architects, London, was held last week at Edinburgh—Mr. T. Walter L. Emden, L.C.C., president of the Society of Architects, being in the chair—to consider a paper by Mr. Ellis Marsland, hon. secretary of the Society of Architects, on "The Statutory Registration of Architects." A resolution stating that the meeting approved the principle of the statutory examination and registration of architects, and was of opinion that it was desirable to promote a Bill in Parliament for the attainment of this object, was unanimously adopted.

Views & Reviews.

THE ARCHITECT AS ARBITRATOR.

A COMPREHENSIVE treatise, clearly defining the position of an architect or engineer in his dual relationship to client and contractor—with their frequently conflicting interests—has long been wanted, and we therefore welcome this book as a useful and practical work dealing with a somewhat complicated subject.

Mr. Gregory is well qualified to set forth both the professional and legal aspects of the architect's or engineer's position, for not only has he practised for more than twenty years as a civil engineer, but he has also been engaged for a similar period as a barrister-at-law in connection with litigation arising from railway and canal construction, and as an arbitrator or referee in such matters. Under these circumstances, Mr. Gregory can sympathetically appreciate the onerous position oftentimes occupied by an architect or engineer, whilst at the same time bringing considerable legal experience to bear upon the numerous knotty points arising in actual practice.

The author introduces his subject with a full explanation of the position in which the engineer or architect stands towards the employer and the contractor respectively, and his remarks place it in the clearest possible light. The following extract gives a good general description of the architect's status from the legal standpoint:—

"In accepting an appointment from the employer, the engineer or architect undertakes responsibilities to the employer under the contract, but to the contractor only under the law. To the employer he may be liable for an error in the performance of his duties; but to the contractor only for a fraud committed or aided by him, in the performance of his functions under the contract, or otherwise. As fraud and deceit are *mala in se*, and in the performance of functions under the provisions of a contract, as in every other transaction, a person is under the legal obligation to be a party to no fraud, and to make no false statement for the purpose of it being used to another's injury, the employer's direction or request to the engineer or architect as to the performance of his duties under a contract is no justification for a fraudulent performance of them. That his functions shall not be exercised in bad faith, is the extent of the engineer or architect's obligation to the contractor with whom he has no privity of contract; while to the employer he may be under the obligation to duly perform all the duties which, by his acceptance of the appointment, he undertook to perform."

The ordinary powers which appertain to an architect or engineer under building contracts are then dealt with in detail, including such as the definition of work to be performed by the contractor; the approval of work; progress certificates; final certificates; course of action in the case of delay on non-completion of works; enforcement of penalties or fines; extras, &c.

Throughout the work the author's explanations and definitions respecting the precise legal construction to be placed upon each point under consideration are supported by references to well-known cases in which a definite decision has been given in the law courts. At the same time we are surprised and disappointed to find no mention of any decisions which have been given within the last few years; in fact, none of the leading cases which have occurred since 1892 are noticed, although several are of considerable importance.

The subject matter of the book is carefully arranged in a concise and simple form, and includes many sound and practical suggestions. A thoughtful perusal of Mr. Gregory's work cannot fail to give the architect or engineer a very clear conception of the legal duties and responsibilities involved in the active exercise of his profession.

T. E. C.

"The Engineer or Architect as the Arbitrator between the Employer and the Contractor; and his other Functions, under Building Contracts." By C. C. Gregory, A.M.I.C.E., barrister-at-law, &c. London: W. Clowes & Sons, Ltd., 7, Fleet Street. Price 12s. 6d.

New Patents.

These patents are open to opposition until July 8th.

1900.—Siphon-Flushing Cisterns.—7,870. C. Darrah, junior, Miller Street, Manchester. The object of this invention is to subdue the noise which occurs when the cistern empties. For this purpose a pipe of about ¾in. diameter is fixed to the lower part of the siphon, its bend being above the top of the cistern. On the downward limb a float is mounted. This float sinks as the water is discharged, and just when an opening at its lower end is about to be uncovered, the float descends over it, allowing air to leak in, however, and so destroying the vacuum. As the cistern fills the float rises.

Sewage Treatment.—9,819. R. H. Reeves, Cedardale, Putney Bridge Road, Putney, S.W. The chemicals required for deodorisation are mixed with the sewage before it arrives at the precipitation tank. The necessary precipitating material is then sprayed on to the sewage in the tank. By these means the percentage of precipitation obtainable is increased. The effluent is passed through a jet and issues as spray. This is done to effect complete oxidation.

Groynes.—11,007. E. M. L. Case, 39, Victoria Street, Westminster, S.W. This invention relates to an improved method of constructing groynes and breakwaters. It consists of sections of planking or metal sheets braced together and fitted with end-projecting plates forming boxes to receive the ends of other sections; the whole enclosing supporting piles.

Paint Mills.—11,518. F. W. Follows, Froxmer Street, Gorton, Lancs. The surface of the grinding cone has long and short teeth tangent to a common circle so as to form taper feeding grooves, while the driving shaft of the cone is made in two parts so that the height of the cone relatively to the hopper may be adjusted without disturbing the gearing.

1901.—Water-Closets. 6,421. H. Smith, 3, Lambeth Hill, Queen Victoria Street, E.C. The top of the trap is square, with a dome rising above the ordinary line. This dome provides an air chamber which prevents siphonage when a series of closets are fixed to the same pipe; moreover, there is no need to fix a vent pipe to each trap.

The following specifications were published on Saturday last, and are open to opposition until July 15th. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1900.—6,464, Pancoast, roof ventilators. 8,612, Whitehead & Ulbrich, ornamentation of tiles, panels, &c. 8,831, Mouchel, building blocks, caissons, piers, &c. 9,047, Melvin & Mann, apparatus for collecting mud, dust and other street refuse. 10,595, Wilkinson, non-slipping treads. 11,046, Burmeister, treatment of town's sewage. 11,378, Ware, door and gate fastenings. 12,116, Clifton, circular saws. 15,683, Edwards, ventilators. 17,385, Heller & Wenzel, automatic locking devices for door and window leaves, and all kinds of roller-doors. 23,383, Thomas, fittings for shop blinds. 23,658, Byers & Abbey, machinery for boring a number of holes in wood or other material.

1901.—634, McKinnon, windows. 1,356, Selby, means for minimising the evil effects produced by the expansion of road or pavement coverings. 4,522, Pintsch, generation and supply of gas for power purposes 4,859, Horsley, taps or faucets. 5,097, Ostertag, locks. 5,255, Heilman, sewer ventilation and disinfection. 6,058, Zimmer, waterproof protective coating for metal, stone, wood, &c. 6,834, Phillips, fans. 7,081, Schougaard & Evans, manufacture of artificial stone. 7,294, Hooper, water-closets. 7,324, Thompson (*Dodge*), treatment of lime. 7,387, Bloxam (*Klönne*), portable folding bridges.

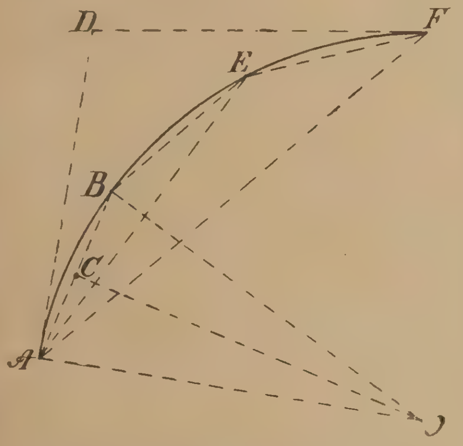
A New Public Hall in East Dulwich, which will include large and small halls, masonic temple and club rooms is to be completed in time for the coming winter season.

SETTING OUT CURVES.

BY G. A. T. MIDDLETON.

IF curves have been previously laid down on plan, whether they be simple or complex they are easy to set out on fairly level and unobstructed land so long as no extreme degree of accuracy is necessary—as, for instance, in the majority of cases where ordinary house property, streets and paths alone are concerned. A series of tangential lines to the curve, either at the points of junction with straight lines as at A and B, or at other points as at C, can be readily pencilled on the plan, and offsets scaled from these lines to points on the curve; and these lines and the offsets can almost as readily be set not on the ground. The correctness of the work depends only on the accuracy with which the instances along chain line and length of the offsets has been scaled, if the surveyor is already capable of correctly setting out a series of straight lines.

Obviously chords may be employed in the same way as tangents, and sometimes with advantage when the curve is a slow one (and its radius considerable), and sometimes of necessity when a tangent line would be obstructed or pass on to land upon which it would not be desirable to trespass.



CURVE RANGING BY MEANS OF THE "TANGENTIAL ANGLE."

It often happens, however, that chain lines cannot be used at all, and yet both extremities of the curve can be seen from any point in it, as when setting out a curved causeway across a sheet of water. If the curve be a segment of a circle, the first thing in such a case is to determine its included angle, which is constant at all points of the curve. Scale the chord A B and rise F C (or versed sine) of the curve. Then $AF = \frac{AB}{2}$ and

$$\frac{AF}{FC} = \tan ACF.$$

This determines the angle A C F, by consulting a table of natural sines, and also the angle A C B, which is double the angle A C F, and the angle A C B is equal to the angle A G B and to the angle subtended by the chord A B at any point in the curve, and is known as the included angle of the curve.

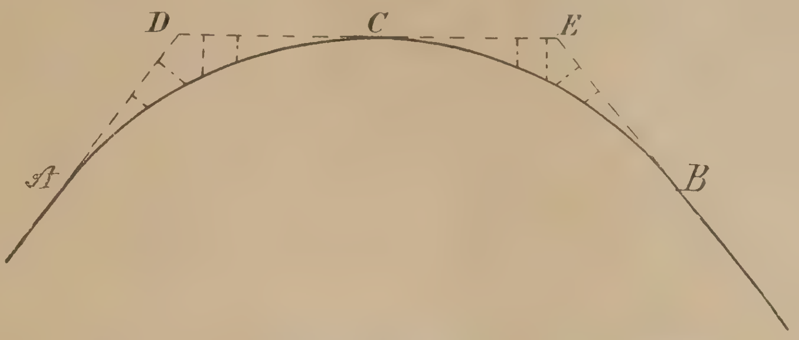
If a box-sextant be used, such as that patented comparatively recently by Mr. Steward, which will accurately observe angles up to 180degs., the instrument can now be adjusted to the ascertained included angle of the curve, and the observer can move about, if on land by walking and if on water by rowing, until he is able to see points A and B directly over one another through the instrument. Whenever this occurs the instrument is located on the required curve, and the position can be marked either by means of a stake or an anchored buoy. When the water is deep, or subject to varying tides, such buoys cannot be depended upon for accuracy, but positions thus fixed are generally near enough for broad foundation work to proceed; the curve being more accurately adjusted when the water level has been reached.

Occasionally it is necessary to accurately determine a point, such as G, lying in water. In such a case it is best to calculate the angles B A G and A B G, and to station two observers, each with a theodolite, one at A and one at B, opening these to the calculated angles, and directing from them the movements of a boat; or, if on land, of a man holding a pole.

It is possible in this way to range any number of points in a curve, the sum of the angles B A G and A B G being constant if it be a segment of a circle, but varying for any unusual or irregular curve—provided, of course, that all points in the curve can be seen from both A and B. Work thus set out is of extreme accuracy, and the possibility of thus exactly determining any point in a curve is sometimes one of extreme value; while the objection which many might naturally raise, that two operators and two instruments are required, does not necessarily apply, as a series of radial lines can first be set out with poles or stakes from A, and the theodolite then moved to B, when the pole-holder would keep himself in the radial line A H by his own "boning" along the stakes to A during the first observation from B, and on the line A J during the second observation, and so on.

The method most commonly employed, however, for setting out regular segments of circles is that of what are called "tangential angles," it being especially applicable to broken ground, while it is practically the only serviceable method for use in tunnels. By its means chords of one chain each in length are set out rather than an unlimited number of points in the curve, but this has been found to suffice in ordinary slow curves of considerable radius.

The points of tangent between straight line and curve, and the radius of the curve, have to be selected, and then the angle between the tangent to the curve and the first chord of one chain has to be determined by calculation. It has been found that if the number 1719 be divided by the radius in chains, the result is this tangential angle in minutes; while a reference to the accompanying illustration will show how it can be ascertained by trigonometry.



SETTING OUT CURVES BY MEANS OF TANGENTS AND OFFSETS.

The chord A B is bisected at C, and O (the centre of the curve) is joined to C, making A C O a right angle. Therefore, the angles C A O and C O A together equal a right angle, and so equal the angle D A O. Take away the common angle C A O, and the tangential angle D A B is equal to the angle C O A.

$$\text{Now} \quad \frac{AC}{AO} = \sin COA$$
$$= \sin DAB.$$

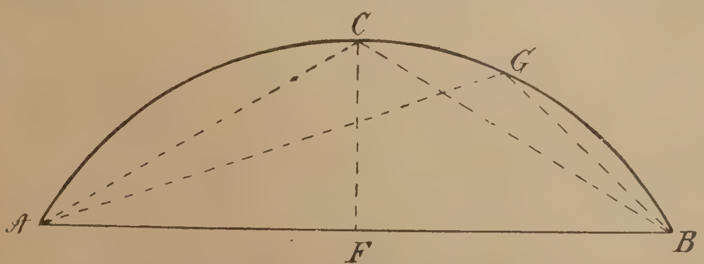
Therefore, half a chain or 50 links (half the chord), divided by the radius, is equal to the sine of the tangential angle.

The theodolite is now erected at A, adjusted, and directed along the tangential line towards D, with the vernier clamped to the main plate. When this is fixed, the vernier is released and adjusted to read the tangential angle. A chain, or a steel tape, is now carefully swung round from a centre fixed at A till its further extremity is cut by the cross hairs of the instrument, when this further extremity will be exactly at B, a point in the curve required having a chord A B one chain in length.

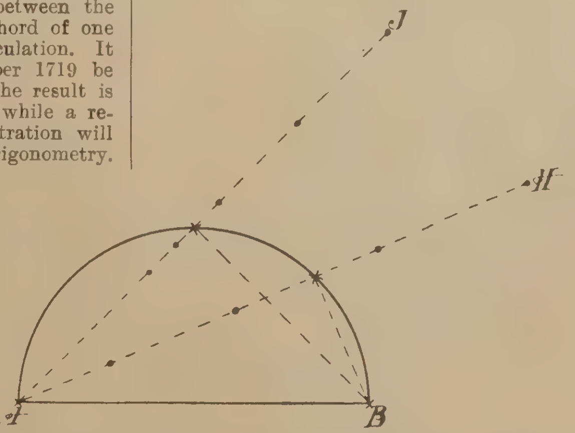
A little further consideration of the accompanying diagram will show that the angle D A E is twice and the angle D A F is thrice the tangential angle D A B, if A B, B E and E F are equal chords. Therefore, if the vernier be adjusted to read double the tangential angle, and the chain or tape be swung from the centre B until its further extremity is cut by the cross hairs, the point E will be fixed, and so on as long as there is no obstruction.

Suppose, however, that no point beyond F on the curve can be observed from A. Note on the diagram that the line D F, tangential to the curve at F, is necessarily equal to the line D A; therefore, the angle D F A is equal to the angle D A F, or to thrice the tangential angle. Set up the theodolite at F, sight back to A, and open the vernier to thrice the tangential angle, giving the angle D F A. You are now sighting along a tangent to the curve, and can swing your telescope over vertically, or else horizontally to the extent of 180 degs., and start afresh as if you were at A.

The explanation probably appears complicated, but the operation is not so in reality, and careful surveyors have been enabled to do work of extreme accuracy by this means.



DETERMINING POINTS IN A CURVE BY MEANS OF THE BOX SEXTANT.



SETTING OUT CURVE BY RADIAL LINES WITH ONE THEODOLITE.

Builders' Notes.

At Broghead Brickworks, near Armadale, belonging to Messrs. Muir & Sons, Ltd., new plant for the manufacture of bricks by machinery was recently inaugurated. The material for the making of the bricks is from a large bing on the estate of Boghead, which is not expected to give out for several years. The rate of manufacture is ten per minute, or about 10,000 per day. Sixty tons of material can be ground in one machine, and turned into bricks in one day.

Competition for Woodwork.—The Worshipful and Ancient Companies of Carpenters and Joiners of the City of London have announced the result of this year's competitions in their respective crafts. Competitors must be English-born and possess their masters' certificate for good conduct. Among those who entered were three apprentices of Messrs. Harry Hems & Sons, ecclesiastical art workers, of Exeter, and all three took high honours. Thomas Milford Butcher, aged seventeen, only son of Mr. William Butcher, of 40, Haldon Road, Exeter, has been awarded the silver medal and £5 5s., the highest prize for any newly carved work. Fred George Knapp, aged twelve, oldest son of Mr. W. Knapp, of 17, Bridge Street, has also been awarded a medal and first prize of £2 in the competition for apprentices under eighteen for three carved panels in oak. Joseph Bransby Hoskins, aged eighteen, third son of Mr. Fred Hoskins, of 3, Oxford Road, St. Sidwell's, has won the second prize and a bronze medal for the best library armchair of oak without upholstery, but ornamental. Such a success by three apprentices to the same master is remarkable.

Berlin Fire Congress.—In acceptance of a pressing invitation from the German Government to attend an International Fire Congress, to be held at Berlin this week in connection with the Fire Exhibition which was opened last Saturday week, the British Fire Prevention Committee will be represented by a deputation comprising Mr. Edwin O. Sachs, chairman; Mr. Max Clarke, A.R.I.B.A.; Mr. F. R. Farrow, F.R.I.B.A.; Mr. F. Hammond, F.R.I.B.A., district surveyor, Hampstead; and Mr. Ellis Marsland, district surveyor, Camberwell. The deputation will be taking the opportunity to examine the general arrangements as to the working of the building law at Berlin, as well as the influence of the new theatre, factory and workshop regulations upon modern structures in that capital; and they will, on their return journey, visit Hamburg, with a view to studying the general fire protective arrangements of the port and the more recent forms of warehouse construction which have been adopted in that city. The observations of the deputation, both at Berlin and Hamburg, at the Exhibition, and in attendance at the lectures of the Fire Congress, will be embodied in an exhaustive report, each member of the deputation taking up a special chapter dealing with that part of the subject with which he is particularly conversant. The report will be published in due course. The arrangements of the deputation show an exceedingly busy week's work travelling, interspersed with several flattering receptions and entertainments. The party left yesterday, viâ Ostend and North Express, for Berlin, and after paying some official visits to-day, and inspecting various buildings, will view the Exhibition, and attend an informal reception in connection with it. On Thursday the deputation will attend the opening of the Congress, which will be an important Government function, attended by the Ministers of State, and held in the new Houses of Parliament. Of the four opening addresses, one will be by Mr. Edwin O. Sachs, on the organisation of the Committee and its investigations in fire-resisting materials. The afternoon will be occupied with visits to electrical factories; and in the evening the deputation will attend the banquet at the Exhibition. On Friday forenoon a number of lectures will be attended, among which those of interest in England will deal with protection in warehouses, with cotton fires and fires on board ship. In the afternoon the deputation will visit the Royal Palace and attend a parade of the Berlin Fire Brigade. In the evening the party will be entertaining a number of public officials to dinner at the Hotel Bristol in return for the courtesies enjoyed, and will afterwards visit an evening fête at the Zoological Gardens. The whole of Saturday will be spent in visiting warehouses, shop property, theatres and other public buildings, as well as the testing station of the Royal Technical College at Charlottenburg, whilst in the evening the deputation will be received by the Mayor and Aldermen of Berlin. After the intervening Sunday the visitors will visit Hamburg, where their attention will be particularly devoted to modern buildings in the harbour and to fire protective arrangements in connection with the free port. The professional part of their visit will terminate on Monday night; and the result of the observations made, as embodied in a report, should prove highly instructive reading.

Surveying and Sanitary Notes.

Change of Address.—The Institute of Sanitary Engineers (Incorporated) has transferred its offices from 63 and 64, Chancery Lane to 19, Bloomsbury Square, W.C.

A Park for Hoole.—A Local Government Board enquiry was held recently into the application of the Hoole Urban Council for sanction to raise a loan of £4,500 "for purposes of public walks and pleasure grounds."

Street Improvements at Sunderland.—The Local Government Board have granted a provisional order giving Sunderland Corporation powers for the purpose of widening, opening, enlarging or otherwise improving the streets called Smyrna Place and Hendon Road.

Improvements at Colwyn Bay.—The Colwyn Bay Urban District Council are about to extend the promenade from Colwyn Bay to Rhos-on-Sea. When concluded, it will be one of the finest promenades in the kingdom, extending for a distance of three miles.

Road Improvement at Barry.—Gladstone Road, the proposed main thoroughfare connecting Barry with the Cadoxton entrance to the town on an easier gradient than the Western Hill route, has been constructed as far as Court Road from Holton Fach, where the glimpses of old Barry are quickly disappearing. The Local Government Board have now given formal consent to the borrowing of £4,700 for the construction of the remaining portion at the bottom end of the town, and in addition to that sum £470 is to be procured for building two houses to replace houses to be demolished when constructing the roadway.

Sydenham Wells Park was dedicated to the public use last week. The park is 17¾ acres in extent, and is close to the Upper Sydenham Station of the South-Eastern and Chatham Railway. The price paid was £7,000. The grounds as laid out present a series of slopes intersected by broad footpaths and ornamented by plantations and a succession of small lakes and rivulets. Tennis courts and a quoit pitch have been provided, and it is intended to form a bowling green. There is also a considerable area of turf available for children's recreation. The whole of the works have been carried out by the Parks Department of the London County Council, at a total cost of a little over £5,000.

Improvements at Hull.—At a recent meeting of the Property Committee of the Hull City Corporation, Mr. Joseph Hirst, city architect, submitted a scheme for the creation of a large central square, close to the Monument Bridge, by pulling down the block of property in Waterworks Street, Junction Street, St. John Street and Chariot Street. The scheme also provided for a public hall, retiring rooms, three large reception halls, and thirty-four new shops, some with ground floor and basement only, and others with four floors. The square would measure 272ft. from north to south and 216ft. from east to west, and would form an open space in the very heart of the city of a little over an acre in extent. The approximate estimate for erecting the buildings, including the purchase of necessary land, was 92,000. The estimated rentals from the new shops was £6,836, and for the public hall £1,014; nett revenue, £8,247. The scheme was unanimously approved, and it was also resolved to widen Charlotte Street.

Rhyl's New Promenade.—The extensive works of the West Promenade at Rhyl, which have been constructed at a cost of between £5,000 and £6,000, were formerly opened last week. This provides the missing link wanted to complete a grand circular drive of 4 miles round the town, and gives a total length of asphalted promenade of 2½ miles, or an acreage of 6¾.

Gladstone Park was recently thrown open to the public. The park, which comprises about ninety-six acres and is situated at Dollis Hill, was formerly the residence of the Earl of Aberdeen, and it was here in the 'eighties that Mr. Gladstone frequently spent his week-ends when Parliament was sitting. The population of Willesden in 1871 was only 15,866, and at the recent census these figures had grown to 114,815. This rapid growth of population made it desirable to preserve as far as possible the open spaces left, and in 1887 Queen's Park, situated between the London and North-Western Railway and the Hampstead Junction Railway, and comprising thirty-eight acres, was secured at a cost of £3,000 to perpetuate the jubilee of Queen Victoria. In 1895 a second park—Roundwood Park, comprising twenty-six acres—was dedicated to the public. It cost £25,956. The cost of the most recently acquired park—Gladstone Park—was £50,000 exclusive of a sum of £6,683 expended in drainage, fencing, gymnasium and paths.

A NEW CATHOLIC CHURCH IN LIVERPOOL.

THE new Roman Catholic Church of Our Lady of Lourdes and St. Bernard, which has been erected next to St. Bernard's Schools, off Kingsley Road, Prince's Park, was formally opened last week. The church, which has cost about £5,500, is constructed of St. Helens bricks, with red Runcorn stone for the windows and other elaborated parts, the roof being covered with Welsh slates. The interior consists of nave and aisles with baptistery and porches at the western ends, and a chancel with two chapels, the sacristies and the three confessionals being placed on the epistle side of the church. Space has also been left on the side for a presbytery which will be built, it is hoped, at some future date. The nave, which measures a total length of 82ft., consists of five bays, in four of which the centre space is divided from the adjoining aisles by an arcading with stone shafts and moulded caps and bases, the fifth bay being occupied by the organ gallery. The body of the church is lighted by means of four-light traceried windows in each bay, and by two similar three-light windows, with a circular window above, in the western wall. The west end, facing Kingsley Road, is the principal elevation. Two storeys of windows, one below and one above the gallery, occupy the chief portion of its surface, whilst in the centre is placed a niche with a statue of the Blessed Virgin, in whose honour the church is dedicated, which has been given in memory of John Constantine M'Manus. The chancel, square-ended and flanked by a chapel on each side, is lighted by means of two side windows, and also by a rose window in the gable, the latter being filled with stained glass depicting the Apparition of Our Lady of Lourdes to Bernadette; whilst a second window, representing Our Lord with St. Bernard and St. Mary Alacoque, has been placed in the north chapel, both being the gifts of generous donors in memory of Thomas and Margaret Maguire and of John Vincent Taylor. The floors of the baptistery and porches are laid with brown tiles; but in the rest of the church they are of wood. The church and sacristies are furnished throughout with the electric light. The general fabric has been erected by Messrs. Roberts & Robinson, contractors, Liverpool, and the whole of the building carried out from the designs and under the superintendence of the architects, Messrs. Pugin & Pugin, of London and Liverpool.

A New Primitive Methodist Chapel at New Boultham, to cost over £1,000, is being erected. The architects are Messrs. W. Mortimer & Son, and the contractors Messrs. S. & R. Horton. The chapel front will be partly in the Gothic style. The floor will be paved with wood blocks. The rostrum will be at the west end, with the choir gallery and organ chamber at the back.

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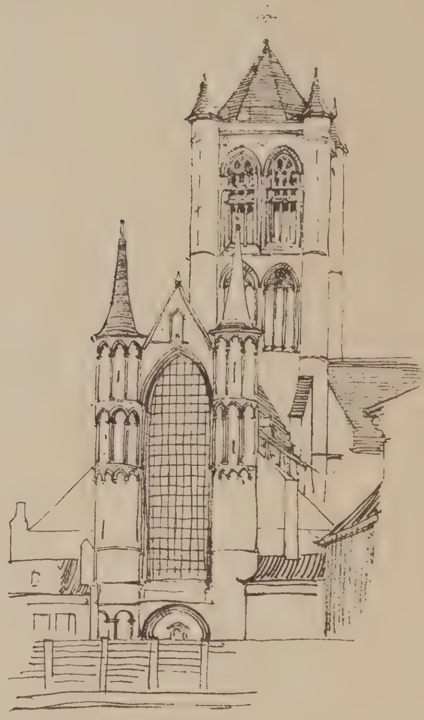
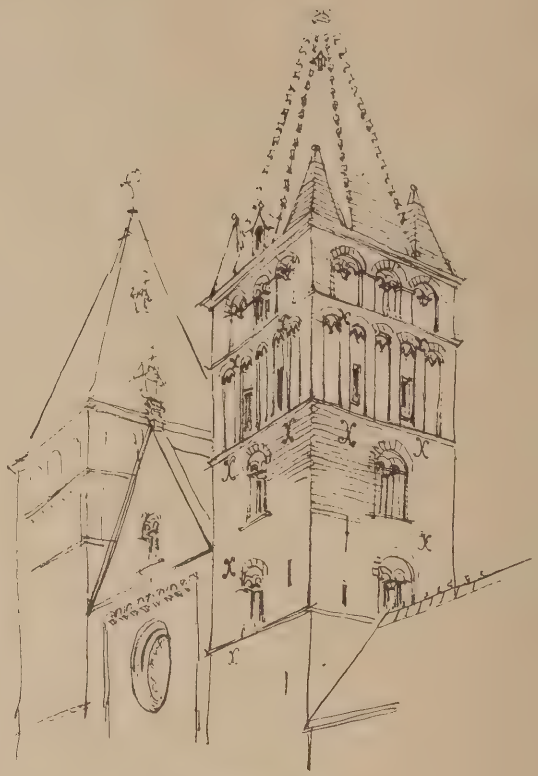
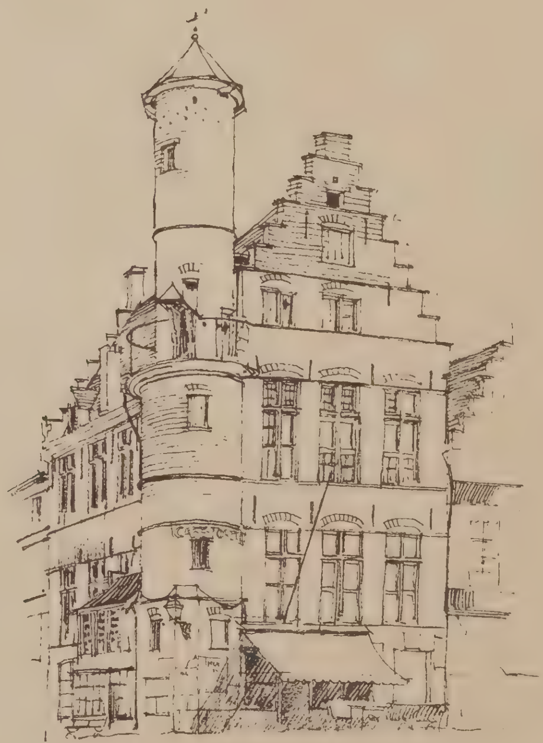
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, June 5th, 1901.



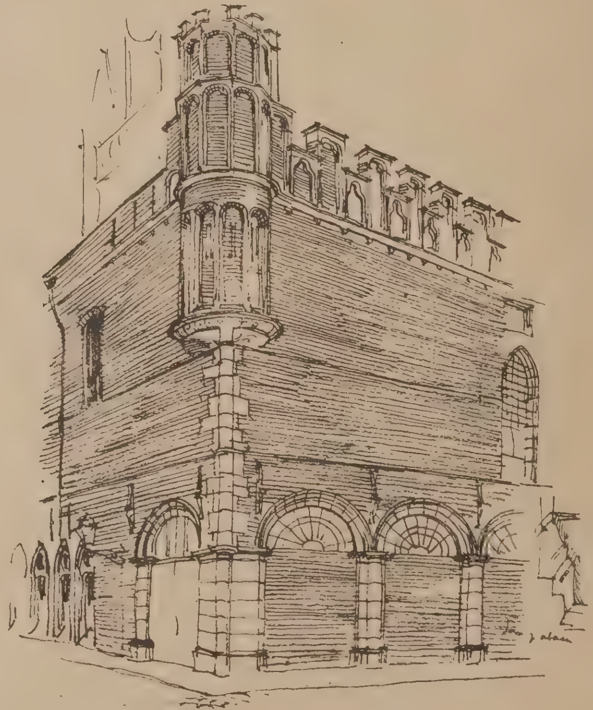
Church of St. Nicholas, Ghent.



St. Jacques, Ghent.



Old Municipal Council House, Ghent.



The Cloth Hall, Bruges.

SKETCHES IN FLANDERS. By James Lochhead.

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Supplement to
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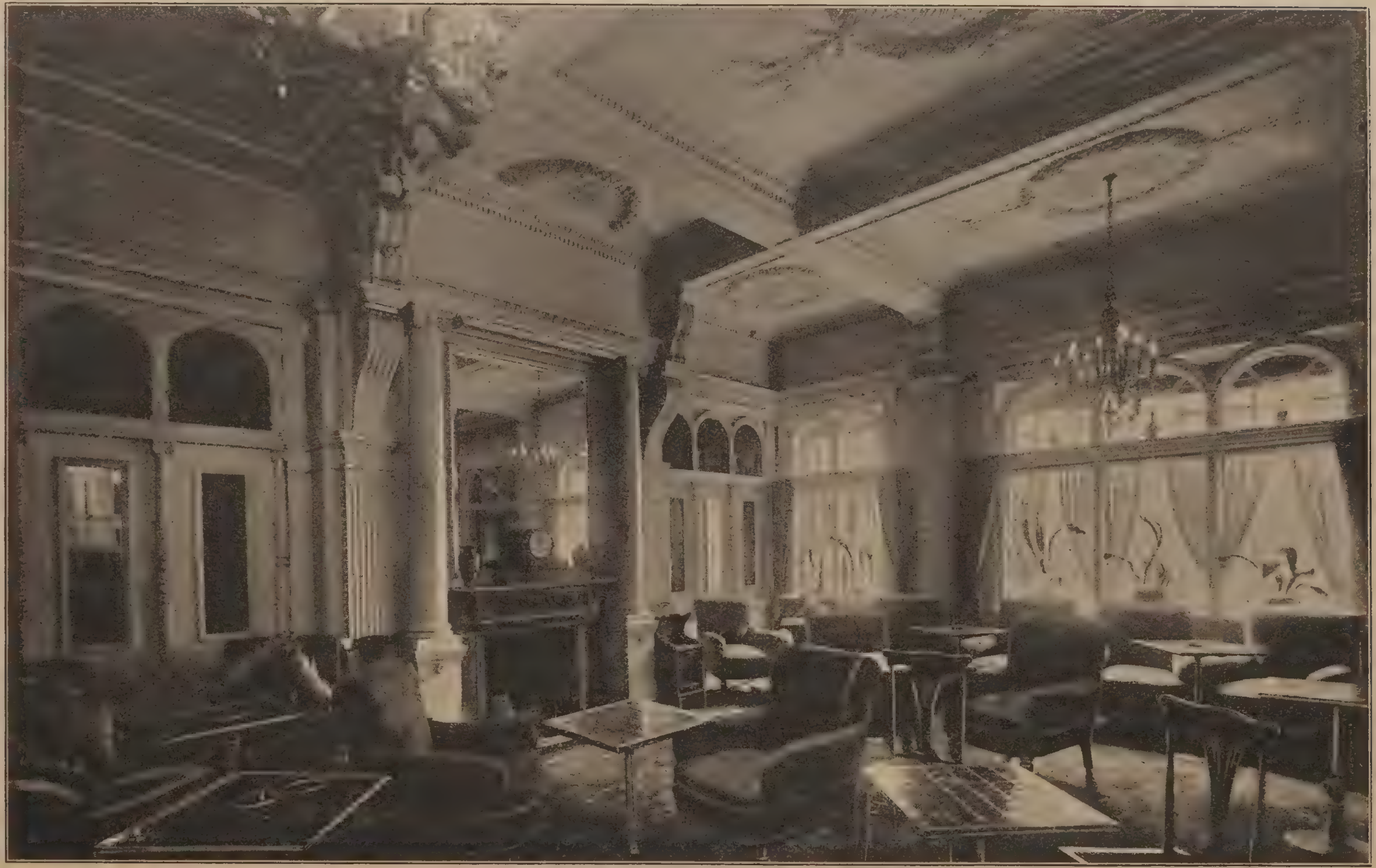
Wednesday, June 5th, 1901.



THE RENAISSANCE LOUNGE AT THE NEW EMPRESS CLUB, DOVER STREET, W.

Wimperis and Arber, Architects.

Colour scheme white, with dark blue panelling and old gold embroideries; oak mantelpiece and jasper marble surrounds.

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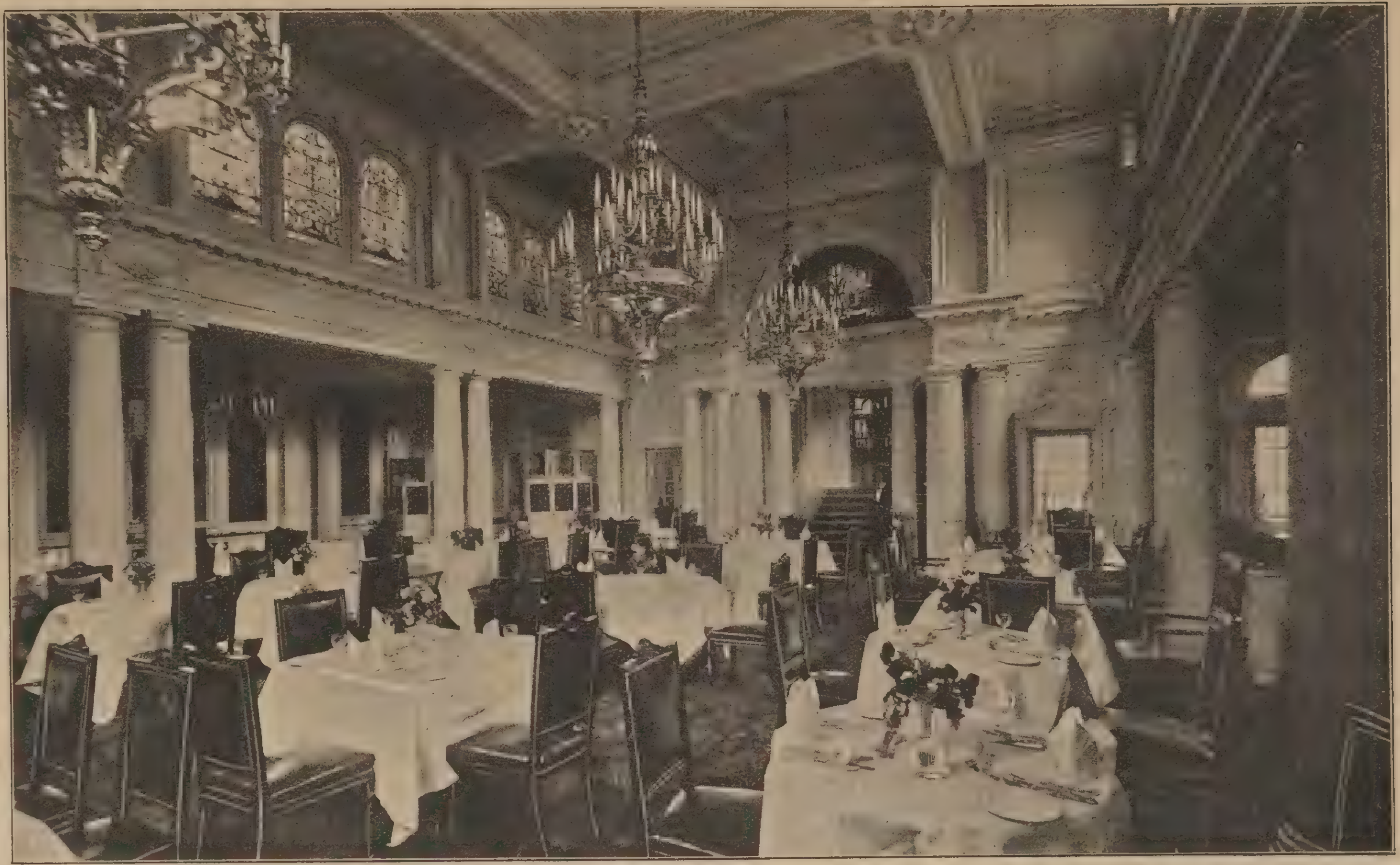

THE GEORGIAN DINING-ROOM AT THE NEW EMPRESS CLUB, DOVER STREET, W.

Wimperis and Arber, Architects.

Colour scheme white, with soft-green brocade panels and stained glass windows.

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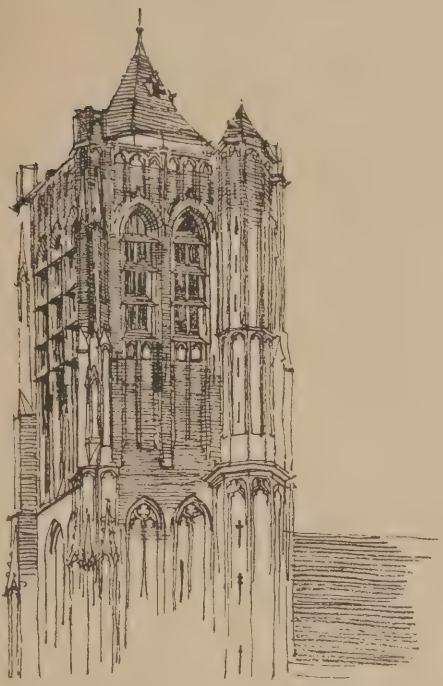
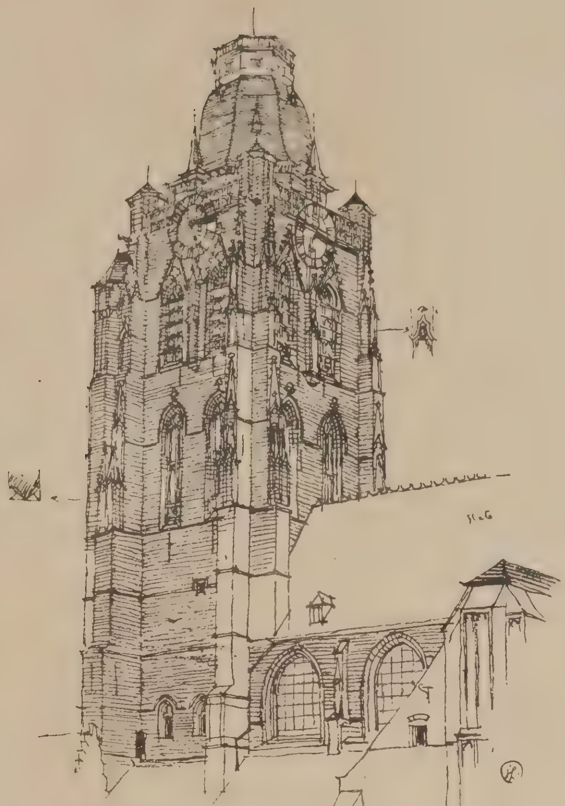
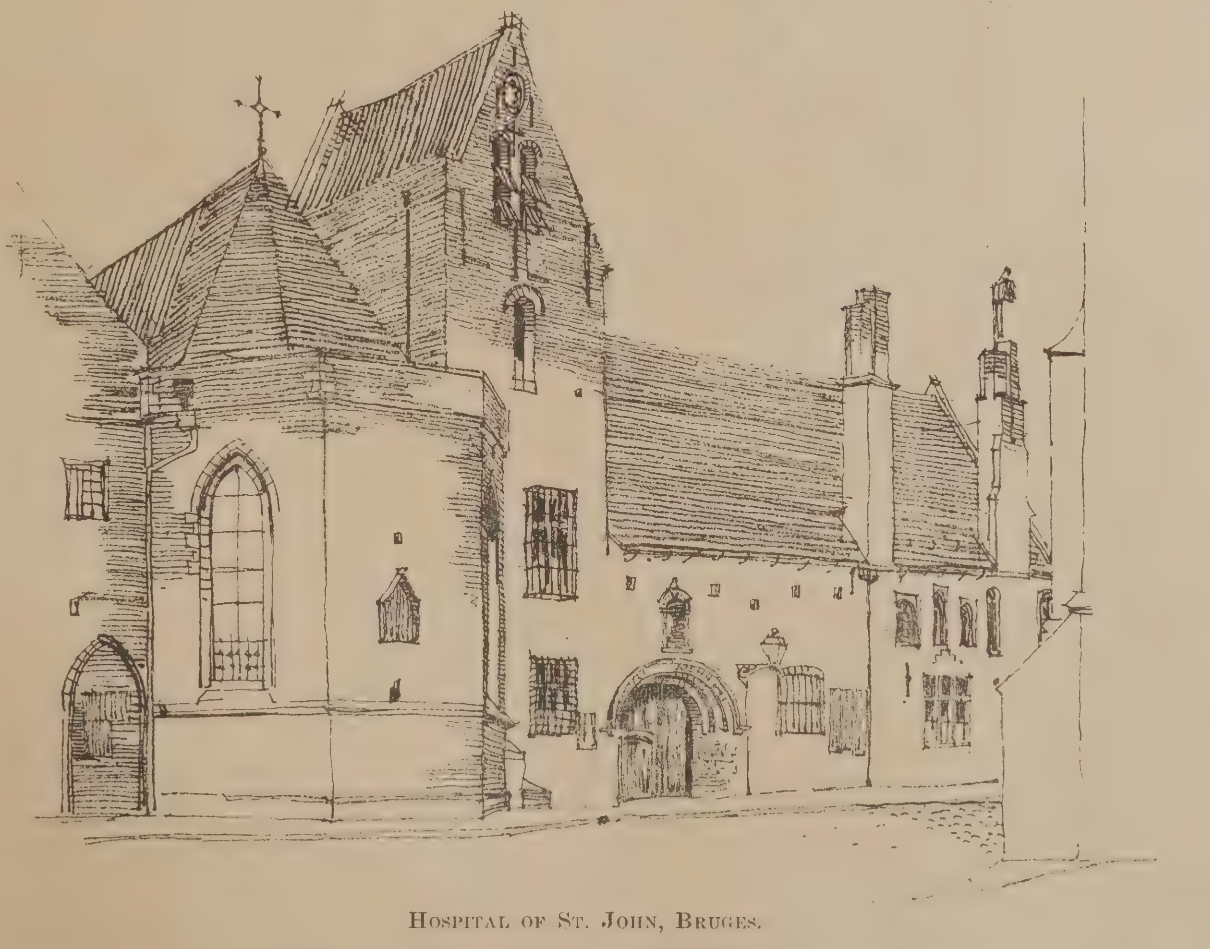


CHURCH OF ST. MARTIN, YPRES.



CHURCH OF ST. WALBURGA, OUDENARDE.



HOSPITAL OF ST. JOHN, BRUGES.

SKETCHES IN FLANDERS. By JAMES LOCHHEAD.

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Bricks and Mortar.

APHORISM FOR THE WEEK.

The perfection of all works depends on their fitness to answer the end proposed and on principles resulting from a consideration of Nature herself, and they [the Greeks] *approved those only which, by strict analogy, were borne out by the appearance of utility.*—VITRUVIUS.

Our Plates. THE plates of the interiors in the New Empress Club are in illustration of the article on p. 344 of this issue, and the sketches in Flanders illustrate Mr. James Lochhead's article on p. 332.

Historic Paris in Danger. THERE are rumours afloat as to the intentions of the officials, who, having a final voice in the matter of street improvements, hold the destinies of Paris in their hands. The worst of these rumours is to the effect that it is proposed to pull down a corner of the Institute of the Palais Mazarin, in order to allow of the prolongation to the quays of that most monotonous of modern thoroughfares, the Rue de Rennes. It would seem to be impossible that this should be seriously contemplated. The Palais Mazarin, which dates from the middle of the seventeenth century, occupies the site of the famous Tour de Nesle, and is the home of the five branches of the French Institute; it is a stately pile and an essential feature of the aspect of the Seine at one of the most characteristic and admirable points on the river on its passage through the capital. To deprive the Palais Mazarin of one of its wings would be to ruin irretrievably the physiognomy of an historic corner of Paris. All this is for the benefit of people in a hurry, a type almost unknown in Paris a comparatively few years ago. The Parisian, from sedentary, has become nomadic, mercurial, mobile. People used to remain in the quarter in which they lived. A mania for gadding about now possesses the Parisian. The extraordinary success of the Metropolitan Railway is evidence of the change. The common opinion was that the "tube" would do no business, and it is certain that the authorities, who shared this view, would never have had the courage to build it but for the prospect of the Exhibition. As it is the railway can barely cope with the traffic. The consequence is that, for the moment, the one cry is for improved means of locomotion. The Galerie des Machines, which, by masking the École de Guerre, spoils what ought to be one of the finest views in the capital, is not to demolished, as promised, and the Champ de Mars, it is rumoured, is to be cut up into building plots.

Kew Church. SOME further improvements and extension of the parish church of St. Anne at Kew are in contemplation, partly as a local memorial to Queen Victoria. It is proposed to add new vestries for clergy and choir and to renovate the quaint old western porch and portico. Kew Church affords an example of the adaptation of an eighteenth century building of no particular style to the modern requirements of church worship. It was originally built in 1715 on a site presented by Queen Anne, and in 1837 it was enlarged at the cost of King William IV. by Sir Jeffrey Wyattville. In 1884 an important addition was made to the east end, by which the church was lengthened some 40ft. A quasi-chancel was formed, surmounted by a low circular dome, a most unusual feature in an English parish church. An apse was carried out beyond, and an extra bay was added to the nave and aisles, while an organ chamber and south porch were provided. Upwards of £5,000 was expended on the work, which involved the moving farther east of the Cambridge mausoleum. Gainsborough was buried in the churchyard, and there is a tablet to his memory in the church.

Llanrhidian Church. THE ancient parish church of Llanrhidian, in the largest of the Gower parishes, has been reopened after restoration. Llanrhidian Church is said to have been founded as far back as the sixth century by St. Rhidian, but since that time has undergone some changes. In 1858 it was reopened, after being closed for some time, and a stone tablet over the porch records the fact. Within this past three years the ancient edifice has again been restored at a cost of about £350. The restoration includes a new roof to the chancel, a new ceiling to the nave, repainting and decorating throughout, repairs to the tower, pointing of the masonry work outside, &c. The chancel has had a new tessellated floor laid down, and a communion table and teakwood choir stalls added. The Rev. D. J. Davies, rector of Llanmadoc and Cheriton, popularly known as the "Gower Historian," came forward too in an interesting role. Filling up his spare time between his pastoral duties and history writing, the rev. gentleman takes off his coat and puts in many hours at wood carving and joinery work, and has carried out the whole of the carving of the new ceiling of the nave. Mr. Davies also acted as architect. There are a number of new stained glass windows. Mr. John Williams, of Pantyglas and Mr. John Williams, of Llanderwg, carried out the joinery and masonry work, and Mr. Thomas Dartnall, of Llanrhidian, did the painting and decorating.

"Queen Eleanor Crosses." ONLY three of the crosses which once marked the series of halting-places when the body of Queen Eleanor, wife of Edward I., was borne about 159 miles in state from the scene of her death, at Harby, Nottinghamshire, to Westminster Abbey, yet remain, namely, the crosses of Northampton and Geddington, in Northamptonshire, and Waltham, in Hertfordshire. These crosses were probably twelve in number. The march began on December 4th, 1290, the last pause before entry into the great Abbey being at the spot still named Charing Cross. The crosses were erected between the years 1291 and 1294. John de la Bataille was the architect of the Northampton cross, whilst William de Ireland was chief craftsman. The cross has been frequently repaired since it was erected. In 1840 Mr. Blore, the celebrated architect, in renovating the structure for the third time, renewed one of the pinnacles, and almost entirely replaced the cresting of the first storey; a broken shaft was also placed at the summit. In 1884 the steps, which had been renewed in 1762 in local stone, were taken away, the foundations made secure and new steps of a harder material added.

Haddon Church Restored. HADDON CHURCH has just been reopened after restoration. The ancient aspect of the church is preserved—the old plastering even being retained. After the walls had been cleaned and several layers of whitewashing removed a number of frescoes were discovered on the east walls, but unfortunately the treatment to which they had been subjected has made them indecipherable. The heads of two aureoled figures can still be faintly traced on the walls, and it is conjectured that these had some connection with a monastic cell hard by, the remains of which are now incorporated in a farmhouse. In other respects also, the church is now in much the same condition as it may have been when first erected in the thirteenth century. It consist of chancel, clerestoried nave, aisles, south porch, and embattled tower with typical lancet windows. Early English is the prevailing style of architecture, except in the chancel arch, which is the only piece of Norman work to be found. In the recent restoration a new oak roof with lead covering has been placed on the nave and north aisle. (The south aisle was similarly treated some four or five years ago.) A wood block floor has been laid in the nave, and the chancel, which was badly restored many years ago, renovated. The tower has also been placed in substantial repair, and has been furnished with new roof. The whole of the work has been carried out by Mr. S. F. Halliday, of Stamford, from designs and particulars prepared by Mr. J. C. Traylen, of the same town. It has cost about £830, of which the rector, the Rev. F. M. Alderson, has yet to raise £250. The east window of the chancel has been filled with a stained glass widow and depicts the Crucifixion, St. George and St. Michael. It is by Kemp. Miss Alderson has designed and carved an oak cover for the font.

Tintoretto at Venice. A VENETIAN newspaper, the "Gazzetta degli Artisti," states that there is an intention to "restore" the famous series of pictures by Tintoretto in the Scuola di San Rocco, and the project is being discussed attacked and defended with the passion that is frequently imported into these questions in Italy. A meeting of artists and critics has been held, under the presidency of Signor Molmenti, the well-known writer on art, and, after an examination of the present state of the pictures, it was there decided, on the initiative of Signor Bressanin, painter, and Professor Cantalamessa, director of the gallery of the Accademia, that it was desirable to reline and carefully to restore and to revarnish the pictures, the meeting pledging itself that such restoration should be of a conservative character. The report of these proceedings is followed by a letter, signed by Dr. Frattin, who bears the title of "Guardian Grande" of the fraternity of San Rocco, pointing out what the confraternity has already done and what are the difficulties in the way of the course proposed. To this the "Gazzetta" adds a somewhat angry reply, committing itself definitely to the view of the artists, that the pictures—which have certainly darkened very greatly with time—should be restored. The course proposed is without doubt hazardous. These very large pictures, some fifty in number, are among the most precious in the world, and their preservation interests not Venice only but the educated world at large. Dr. Frattin makes one common-sense suggestion that the authorities should wait until the pictures have been examined by Professor Cavenaghi of Milan, a practical picture restorer who, by the common consent of experts all over the world, has a better understanding of the way to treat Italian pictures than any other Italian. It would probably be well to abide by Signor Cavenaghi's opinion, and to leave it to him to say whether the cleaning of these masterpieces could be safely undertaken.

A German Art Experiment. THE Grand Duke Ernst Ludwig of Hesse, says a correspondent of the "Standard," has achieved a unique position among German sovereigns as a promoter of art. Unlike some of his contemporaries, who appear to regard art mainly as a medium for the glorification of their dynasty, this young ruler is employing his patronage and wealth, without any thought of self, in the effort to crystallise some of the leading tendencies of the period into a distinctively German style. It is in the so-called Secessionist School that he finds the promise of his faith, and in the departments of applied art that he seeks its realisation. Penetrated by the conviction that a favourable environment, free from worldly care, is essential to the full development of the artistic nature, the Grand Duke determined two years ago to found in the City of Darmstadt a colony of artists who should be at liberty, under his ægis, to create untroubled by the demands of the market. He accordingly selected, chiefly from Munich and Vienna, five young artists, distinguished by their performances in the industrial arts—Peter Behrens, Hans Christiansen, Ludwig Habich, Patriz Huber and Joseph Olbrich. For their use he reserved the "Mathildenhöhe," near the Grecian chapel erected for the use of the Russian Emperor and Empress. From this hill, which is situated on the northern periphery of the city, magnificent prospects may be commanded of the Odenwald; and there in the course of the past two years the artists have been busily engaged, at the expense of their royal patron, in the delightful task of carrying into actual fulfilment their individual ideals in the way of ateliers and dwelling-houses. The results of the experiment have now been thrown open to the inspection of the public, in the hope that people may be inspired to construct their own homes on similar German lines. The exhibition bears the title, "A Document of German Art." The claim contained in this title is justified by the fact that none of the houses contain a single article of foreign origin. Down to the smallest details, such as cups and saucers, spoons, and door handles, these homes have been constructed in accordance with the personal directions of their artist owners.

A Museum of Modern Sculpture.

THE German Emperor is stated to intend founding at Berlin a museum of casts from masterpieces of modern sculpture, the nucleus of the new collection to be formed by the casts and plaster sketches (*maquettes*) which are to be sent to the Fine Arts Exhibition to be held next year at Dusseldorf. Such a collection would be of inestimable advantage to all students of modern art, and to the public. No doubt it would be made to include all schools of sculpture during the nineteenth century and onwards. Such a museum, especially if it accompanied a selection from the works of the most notable painters of the nineteenth century, would be of unique interest, as giving permanently what hitherto has only been afforded by great international exhibitions. The Luxembourg has made a beginning in this direction, confining itself hitherto to French sculptors and medallists, but in the section of painting including not only such modern Frenchmen of fame as have not been translated to the Louvre, but the protagonists of modern art of all countries. Berlin has, not without much protest and criticism from the elder and more conventional school connected with the Academy of Fine Arts, admitted to the honours of its National Galerie such foreigners of commanding influence as Puvis de Chavannes, Manet, Claude, Monet and Renoir—including also Rodin among the sculptors to be honoured. The Dresden Gallery has hitherto exercised its patronage of modernity only in purchasing some masterpieces of nineteenth-century German art.

NEW WESLEYAN CHAPEL AT SOUTHSEA.

A NEW Wesleyan Chapel has been erected in Albert Road, Southsea, almost at the foot of the Highland Road bridge. Mr. T. Wonnacott, of Merton Road, Southsea, was the architect. The building is in the Classic Corinthian style, with a tower at the south-west corner 80ft. in height, fashioned to the model of the campanile at Venice, and on the opposite corner there is a subordinate turret. The materials are red brick with Bath-stone facings. The main entrance is in Beach Farm Road. The seats are in varnished pine. In the interior the Doric style is followed, the gallery on three sides of the building being supported by fluted Doric columns. The seats are placed in the shape of a crescent, on a slope, so that all the congregation sit facing the rostrum, at the rear of which is the choir platform. Accommodation is provided for 800 persons, while the two-storeyed schoolroom, to which is attached a kitchen, will seat 600 children in the five classrooms. The chapel is heated with hot-water apparatus, and electrically lighted. In his aim to make egress easy, the architect has provided an entrance 35ft. in width, so that it will be possible to clear the building in one minute, while all the doors, which open outwards, are fitted with patent panic bolts. The entire cost of the building is estimated at £6,000.

Law Cases.

Stealing Houses: An Extraordinary Case.—At the County of London Sessions recently George Henry Richards was convicted of having stolen about a ton of zinc from the roof of No. 32, Hoxton Square. On July 23rd last year he called on a house-agent with reference to three houses, then unoccupied and advertised to let, situate at No. 32, Hoxton Square, and Nos. 23 and 25, Hoxton Street. They were adjoining premises at the corner of two thoroughfares. Richards produced a neatly-printed card, upon which he styled himself as a member of a firm who were "builders and contractors, sanitary engineers, plumbers and decorators." Their head office was in St. Ann's Road, Tottenham, and their yard and stores in the immediate vicinity. He told a story of a prospective tenant anxious to view the vacant residences, and was allowed to have possession of the keys. These were given to him on the understanding that they were to be returned in the evening. This, however, he failed to do. As events showed later, his only object in getting the keys was to obtain entrance with the dishonest intention of dismantling the place. With the assistance of other men—one of whom was ordered nine months' imprisonment later—Richards stripped the roof of about a ton of zinc, worth £5 as old metal, and in addition considerably damaged the building in the process, besides exposing the upper rooms to the ill-effects of bad weather. The sheets of zinc were rolled up into a more portable form and placed ready for removal at the entrance door. At this stage a policeman saw Richards and another man leave the house and presumably go in search of a van to remove the stolen property. The policeman's suspicions were aroused, and he investigated matters by climbing over a wall and entering the premises. Detective-sergeant Hook subsequently arrested Richards. Asked as to whether he was ordered twelve months' hard labour at the Sessions in December, 1898, Richards caused some laughter by remarking, "Do you mean when I stole two houses?" The chairman said he remembered the extraordinary incident well. The prisoner, seeing that no one was in charge of two houses in North London, deliberately set up a hoarding and razed both to the ground. The materials he disposed of. Parliament had never dreamt of a man being so exceptionally audacious, and he could not be indicted for the theft of the houses. He, however, was convicted of appropriating the bricks, &c. Warder Chesterton proved also that Richards had suffered three months for lead stealing, and five years' penal servitude for fraudulently obtaining building requisites. Detective-sergeant Hook added that in the summer of last year the prisoner, having ascertained a few particulars from an agent in the city, descended on Chandos House, Albert Street, South Norwood. Without the slightest authority he pulled the place down. Witness was given the address, but he could not find the house. There was only the ground it had stood on and just a little of the four walls remaining. He had disposed of the bricks, the doors, windows, stairs, balusters, water-pipes and gas-fittings. He was not a man of any substance, and his "head office" consisted of two small rooms with not a sovereign's worth of furniture, and his storing yard was an exceptionally small backyard. The learned judge now ordered Richards three years' penal servitude.

A Dispute about Laths.—The case of *Hollis Brothers & Co.* v. *Gibbs Brothers* was heard recently at the Leicester County Court. It was begun in the King's Bench Division of the High Court, and remitted to Leicester. The plaintiffs, who are timber merchants of Leicester, claimed from the defendants, who are builders' merchants of Loughborough, £135 8s. 3d., the price of 2,500 bundles of C.R.W. laths at $11\frac{3}{8}$d. per bundle, plus storing and warehousing charges. On October 9th last the defendants wrote to the plaintiffs asking a price for plaster laths. Plaintiffs replied on the following day, and agreed to supply 5,000 bundles at $11\frac{3}{4}$d. per bundle. The defendants agreed to the price, and plaintiffs wrote saying they would supply the laths within three weeks, subject to safe arrival at Hull. In that time the markets had fallen, and that was the reason the defendants wished to get out of the contract. The defendants stated that the plaintiffs had not given them notice of arrival at Hull, as they should have done. Plaintiffs, however, wrote on October 19th saying that the laths were due at Hull. The defendants agreed to take half the bundles, and they did so, but absolutely declined to take the balance. The laths came over in two ships, one containing 2,200 bundles, and it was that cargo made up to 2,500 bundles that the defendants took. The other 2,500 bundles were stored at Hull, and the action was brought to recover the cost of these laths and the rental. Defendants' counsel urged that the fact that plaintiffs did not give notice of the arrival in Hull put an end to the contract. Mr. Lawrenson, builders' merchant, of Loughborough, stated that he had had twenty-five years' experience of the building trade, and he knew it was the custom to advise arrival of laths or timber. It was a well-established rule to give notice of arrival of goods sold. If that was not done he should not think that put an end to the contract.—His Honour said he should find for the plaintiffs. He did not think the custom must be adhered to in each case. Every case must fall or stand on its own merits, and he thought in this case the defendants had had sufficient notice of arrival. That was proved by the fact that on October 20th the defendants wrote to say they did not expect the laths so soon, and, further, said they would send orders. He thought, therefore, the defence failed. Even if it did not, it would not put an end to the contract, but would merely be a case for a counter-claim. Verdict for plaintiffs for £134 9s.

NEW BATHS AT SELBY.

THE new public baths which have been built by the Selby Urban District Council at a cost of nearly £6,000 were opened recently. The structure is erected in the south-east corner of the park, within a short distance of the railway station, and practically in the centre of the town, the roads to the buildings being public highways. It consists of one large swimming bath, 84ft. by 43ft. 6in., with a water measure of 75ft. by 30ft. There is ample dressing-box accommodation, and also a spectators' gallery. There are ten slipper bathrooms, which will be used for first- and second-class baths, and ladies' baths when required. These are situated on either side of the front entrance, two being fitted with vapour baths and needle douche, with separate w.c. accommodation. In the centre of the front is the pay-office section, with first- and second-class entrances, and corridors on either side, while immediately overhead is the caretaker's house. The laundry and boiler-house, which are on the ground-floor level, are placed on the right-hand side of the building, the former being fitted up with the most recently improved machinery. The chimney from the boiler-house is placed at the rear of the building. The greater portion of the basement comprises an open crypt, where all the pipes for circulation and waste are exposed, so that any repairs or damages may be seen and executed at any time without the customary digging and cutting of walls. Provision is left on the site for the erection of a small or first-class swimming bath, which may be found necessary in the future. The buildings are of the best red brickwork, with stone heads and sills and other dressings from Tunswell quarries, Morley; and the gables are finished in stucco and half-timbered work with overhanging eaves. The internal walls of all the buildings are lined to an average height of 3ft. with glazed bricks, principally white; and the remainder of the height in pressed red and buff bricks, neatly pointed with a white joint—plaster and woodwork being avoided wherever possible. The floors are almost entirely of concrete, with smooth and even face. The roofs are open to the top in ironwork and dressed timber, with Louvre skylights on the top, which are made to open for the full lengths for natural ventilation, and are covered with patent glazing without putty. The roofs are covered with the best Welsh slates and red tiles. The ventilation, heating and drainage have received especially careful consideration. Messrs. Walter Hanstock & Son, of Batley and Leeds, were the architects.

ELECTRIC POWER IN BUILDINGS.*

By W. A. AGNEW.

I PROPOSE to describe how the electric current is produced commercially, and how it may be applied in buildings to the working of passenger and goods lifts, and ventilating fans, and also to the artificial heating of rooms.

Although electricity may be produced in many different ways, the only commercially successful way so far is that in which the current is generated by dynamo-electric machines, the same type of machine being employed as a motor. In order to understand the action of the dynamo-electric machine, whether used as a generator of electric currents or as a machine for transforming electrical into mechanical energy, it becomes necessary to consider the fundamental laws which govern its design and construction, and to examine progressively the experiments and apparatus of the early experimenters.

Early Experiments.

In 1820 Oersted, using a voltaic battery as a source of current, discovered that a pivoted compass-needle could be deflected by the passage in close proximity of an electric current, and in the same year Michael Faraday discovered the rotation of a current-carrying conductor round the pole of a magnet, and constructed several pieces of apparatus of this type, in some of which the conductor revolved round the magnet, while in others the magnet itself revolved.

In 1825 William Sturgeon constructed the first electro-magnet. Continuing his investigations, Faraday in 1831 discovered that electric currents could be produced in conducting circuits by moving them relatively either to a magnet or to a circuit carrying a current, and, following out this idea, constructed an apparatus in which a copper disc revolving between the poles of a powerful magnet generated a current which was collected by wires rubbing on the axle and edge of the disc.

This may be regarded as the first instance of the continuous production of electricity by the movement of a conductor in a magnetic field, and it is on this principle that all modern continuous-current machines are constructed. Following in the footsteps of these early experimenters came a host of inventors, and numerous forms of electric-generators were constructed, in most of which a steel magnet revolved before fixed coils of wire, or the coils revolved while the magnets were stationary.

It was soon recognised that electro-magnets possessed decided advantages over the permanent steel magnet usually employed, and about 1867 machines were constructed in which the current generated by the machine itself was employed to energize its own magnets. This principle of self-excitation was discovered almost simultaneously by Varley, Wheatstone and Werner Siemens, and the term "dynamo-electric" was first used by Wheatstone to distinguish self-exciting machines from those in which permanent steel magnets produced the field.

In 1870 Gramme introduced a form of armature which showed a distinct advance on all others, and shortly afterwards his machines were sold commercially. This type of armature, with some modifications, is in use at the present day, and possesses considerable merit for certain purposes. In 1872 Von Hefner Alteneck introduced the drum-wound armature, a construction which in a modified form is used on almost all first-class modern machines.

These improvements, together with the increased attention given to the theoretical side of the matter by Maxwell, Hopkinson, Kelvin and others, have gradually brought the dynamo-electric machine to its present excellence, and each year sees larger machines constructed and further improvements made.

Dynamos driven by Gas Engines.

It would be beyond the bounds of this short lecture to pursue these improvements to their end, or to fully discuss the complete equipment of modern electric-supply stations, but it is interesting, perhaps, to note that in large buildings and institutions where a considerable amount of current is consumed it becomes necessary to consider the advisability of erecting a private generating plant instead of procuring current from the supply company's mains.

By driving dynamos by gas engines it is often possible to generate current at a considerably lower rate than that demanded by the local supply corporation. Modern gas engines using town gas require about 50 cubic ft. per unit of electricity generated, and by using heavy fly-wheels to the engine, together with a battery of accumulators, a perfectly steady supply can be obtained. (One unit = 15 lamps of 16 c.p. lit for one hour.)

Messrs. Drake & Gorham, whose large experience with isolated installations enables them to speak authoritatively on this point, issue the following table of costs: First cost includes the complete installation with accumulators sufficient to maintain half the number of lamps for nine hours after the engine has been stopped :—

No. of 8 and 16 c.p. lamps.	40	66	100	130	190	260	330	530	800
First cost -	£320	430	560	750	900	1150	1460	2302	3270
Annual working cost.	£16	23	30	33	47	65	80	120	168

Oil, Steam and Water Power.

Petroleum engines have been greatly improved during the last few years, and are extremely useful for country situations where coal is expensive. They require little attention, and are very economical in running, as they use only about 1¾ pts. of oil per unit generated.

In large installations steam power is most generally used; and where as many as 2,000 lights are installed the total running cost may be reduced as low as 1·1d. per unit.

In country situations it is often possible to utilise water power, and many instances occur where this plan has been adopted with signal success. With modern turbines fitted with improved governors it has been found quite practicable to run the installation without using a storage battery, thus effecting a considerable saving in first cost and maintenance. At Bramore, Ross-shire, no accumulator is used, and the entire plant is entirely automatic in action. As an instance of an up-to-date water-power installation mention may be made of Ardross Castle, Ross-shire, where two Gilkes' turbines of 25 h.p. each are coupled direct to Crompton dynamos.

As no accumulator is used, these machines are fitted with automatic governors, and the machines start and stop themselves automatically. About 350 lights are installed in the Castle, and about twenty-nine rooms have been fitted with electric heaters, which have proved very valuable in saving labour and coal (the cost of the latter at Ardross is about 30s. per ton). The farm machinery is also driven by a 15 B.H.P. motor. In addition, the church (situate about 600yds. from the Castle) is lit and heated electrically. Crompton heaters are employed. It is found that the current costs about ·55d. per unit, a most remarkable result and one worthy of serious attention by those deciding on country-house installations.

Electrically-Driven Goods Lifts.

Perhaps the most familiar application of electric power in buildings (next to the electric light) is the passengers or goods lift, and considerable trouble has been taken by engineers in bringing this apparatus to its present high state of perfection. It is in such work that the economy of the electric motor is most manifest, as it only consumes current in strict proportion to the work on hand, and has absolutely no stand-by losses when at rest. Contrast this with the hydraulic lift, which absorbs the same amount of power for each journey, however loaded, or with lifts driven by gas or steam engines, where the machinery has to be kept constantly in motion, and the advantages of the electric lift will be at once apparent, especially when the freedom from noise, compactness of motive gear, and general handiness are also taken into account.

In order to economise space as much as possible, it is usual to couple the motor direct to the winding gear, thus dispensing with all belting and pulleys, and the whole gear is usually designed so that it may be fixed either in the basement or directly over the top of the lift shaft. In the electric lifts made by Messrs. Cribbes & Ross, Beaverhall Works, Edinburgh, the motor is coupled direct to worm-gear and transmits its motion to the winding-drum through single-reduction gear. The controller is mounted on the same bedplate, and consists of a barrel reversing switch coupled to a sliding-contact resistance so devised as to make it impossible for the attendant to switch the current on too rapidly, or to reverse the motor before the cage comes to rest. Immediately the current is cut off the motor is brought to a standstill by means of a brake.

Messrs. Archibald Smith & Stevens, Janus Works, London, manufacture a lift gear in which the pull on the hand rope actuates a multi-contact reversing switch, the cutting-out of the starting resistance being accomplished by ratchet gear worked from a "wave-wheel" fixed on the drum spindle. On pulling the controlling rope to stop the cage, the resistance is automatically reinserted ready for another journey.

Messrs. Waygood & Co.'s lifts are made either of the belt-driven type or direct coupled. The controlling gear consists of a reversing switch worked by the hand rope and fixed in conjunction with a resistance switch which slowly cuts out the resistance when starting. An arrangement which avoids the necessity of a hand rope passing through the cage consists of a small switch fixed in the cage which operates the main controller by means of a "pilot" current.

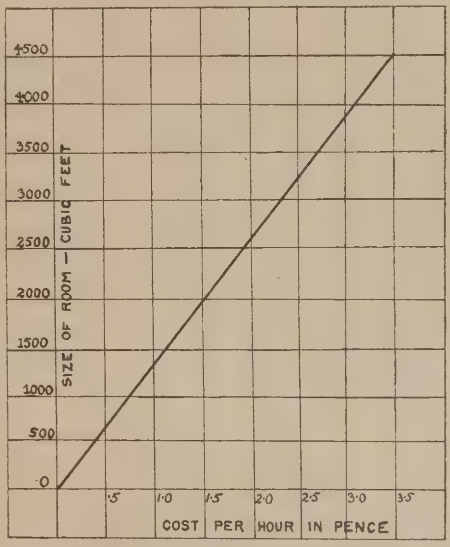

FIG. 1.—COST OF ELECTRIC HEATING AT 1·5D. PER UNIT.

Automatic Lifts.

The electric lift may also be made purely automatic in action, so that by pressing one of several buttons fixed in the cage the car travels to the corresponding floor and stops there automatically.

The Cutler Hammer systems of lift control are two in number: (1) Where the lift is operated *mechanically* from the car; (2) where the lift is operated *electrically* from the car. In the latter arrangement, which is applicable for very high buildings, where the handling of the ordinary hand rope would be difficult on account of the excessive length, the controller is connected (by means of an insulated cable) to a switch fixed in the car, which is worked by hand. In the first system a hand rope is employed, on pulling which a reversing switch is rotated through 60 degs. on either side of the centre, thus lifting off the mechanical brake on the motor shaft. Further movement brings all the armature resistance into the starting position and also closes a solenoid circuit, thereby switching on the main current and starting the motor slowly. The armature resistance is then allowed to switch out of circuit slowly, being controlled by a dash-pot. In stopping the lift the hand rope is pulled the reverse way, first introducing all the armature resistance into circuit, and then sharply cutting off the main current by the solenoid mentioned above. The mechanical brake comes into action and the car

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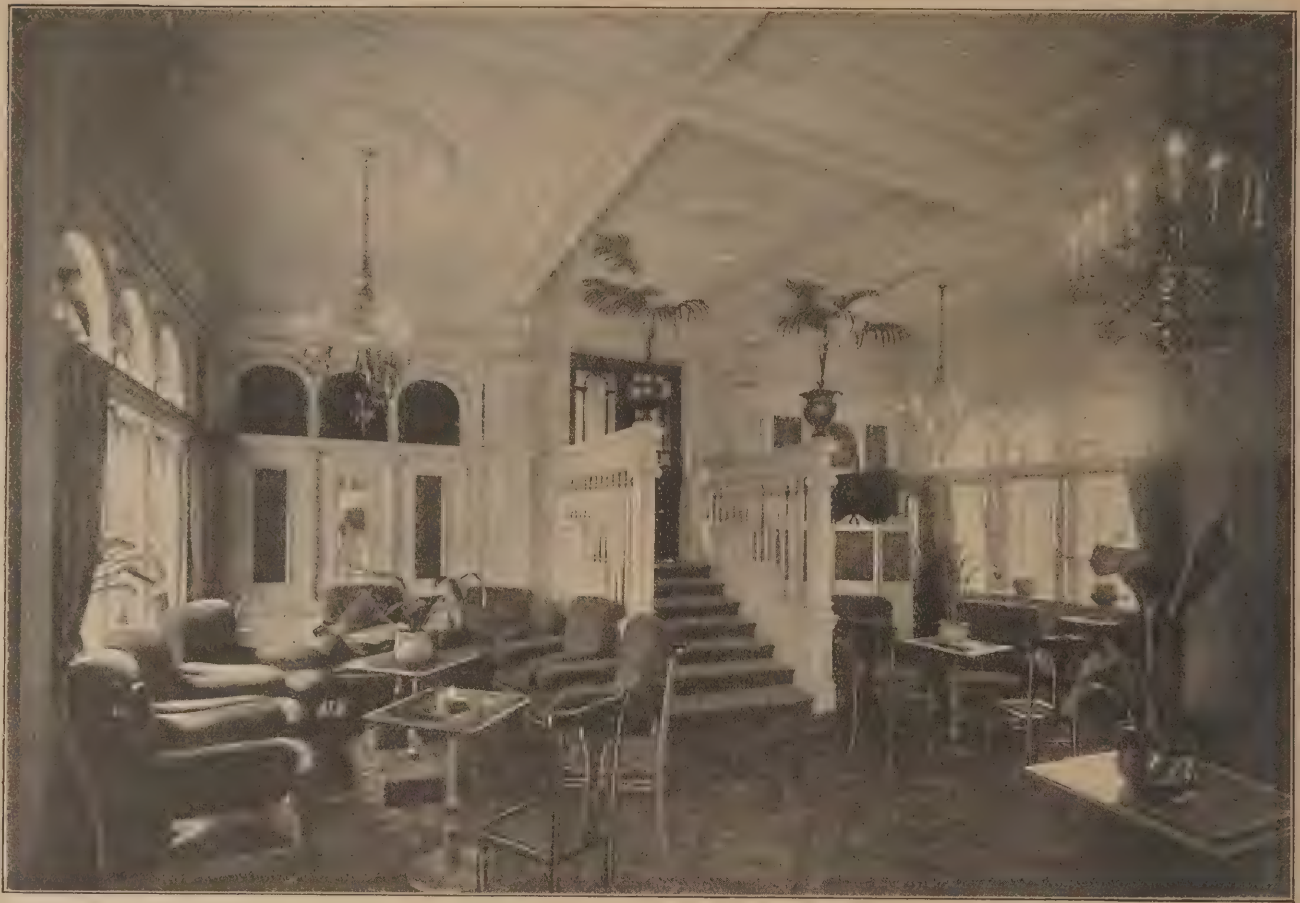
* A lecture delivered before the Architectural Society of Edinburgh.



PART OF THE RENAISSANCE LOUNGE, NEW EMPRESS CLUB, DOVER STREET, W. WIMPERIS AND ARBER, Architects.

is brought to a standstill. The field-magnet coils are allowed to discharge through incandescent lamps, thus preventing damage to insulation.

Heating by Electricity.

One of the commercial uses to which the electric current has lately been applied has been the artificial heating of air in rooms, and while the average cost of current is still too high to permit any very extended use being made of this method of heating, yet the safety of the apparatus, its cleanliness, and the readiness with which the heat may be turned off and on, are factors which are attracting great attention, and its use in offices, theatres and rooms not continuously in use is becoming more extensive every day.

Fig. 1 shows graphically the cost of electric heating in Edinburgh, where current cost 1½d. per unit.

In the Crompton electric radiator the heat is obtained by the passage of a current through thin resistance wires embedded in a coating of strong vitreous enamel of high insulating properties, and capable of withstanding the heat of the wire itself. In the Prometheus radiator the heat is obtained by the passage of the current through thin strips of resistance, and the radiator is made more cheerful-looking by means of a ruby lamp placed inside. In the Apollo radiator large glow lamps consuming about 200 volts each are used, and give off a cheery glow with considerable heat.

Another application of electric power in buildings is that of ventilating fans. Usually the motor is mounted direct on the fan spindle and runs almost silently.

It is important to ascertain the best position to secure maximum effect and also to prevent the motor from being overloaded by back draughts.

The Ancient Parish Church of Broughton-in-Furness has had a new tower and new peal of bells added. The tower is a handsome structure designed by Messrs. Austin & Paley, of Lancaster, and is in keeping with the Norman architecture of the church. The new bells are eight in number.

THE NEW EMPRESS CLUB.

THE New Empress Club in Dover Street, W., has been erected from designs by Messrs. Wimperis & Arber, architects, and entirely decorated by Messrs. Hooydonk & Co., Ltd., decorative artists, of 25, Old Burlington Street, W. (We are indebted to the latter for the accompanying illustrations.) This club offered wide scope to the decorator; the main staircase, carved in marble, and panelled out with a reproduction of an old Italian brocatelle designed in Gobelin blue, is very dignified. The rooms are decorated in various styles, from the light French Louis XV. reception room to the stately Georgian dining-room. The general scheme of colouring is pure white, sufficient contrast being obtained by the silk panelling on the walls, and curtains, furniture and carpets. Messrs. Hooydonk have employed their patent "Dækoria" for columns, pilasters, mantelpieces, overdoors, &c.

THREE TOWNS ARCHITECTURAL SOCIETY.

AT the fifth annual meeting, held recently at Plymouth, the president of the Three Towns Branch of the Devon and Exeter Architectural Society, Mr. Henry George Luff, A.R.I.B.A., occupied the chair, and amongst those present were Mr. Charles King, F.R.I.B.A., Mr. E. W. Lister, Mr. W. H. May, M.S.A., Mr. E. Coath Adams, M.S.A., Mr. M. Alton Bazeley, C.C., Mr. A. E. Lethbridge, C.C., Mr. Arthur Heath, Mr. J. H. Dwelly, W. Hitchins, S. Griffin, and Mr. B. Priestley Shires, A.R.I.B.A., hon. secretary and treasurer of the branch. The chairman announced that the annual meeting of the parent society would be held at Plymouth this year, on Saturday, June 1st. Mr. Shires, presenting the report, stated that during the year the library had been fairly started, under the management of Mr. W. H. May, and already good use had been made of it. A list of books in the library, together with a copy of the rules, had been sent out to each member. During the past year the Society had been materially strengthened by the accession of new members as follows: one honorary member, three members, three associate members, and five associates—in all, twelve; whilst, on the other hand, the council regretted to record the decease of one of their members, Mr. Chastel de Boinville, the result of an unfortunate accident. Efforts were made by the council to dine together as last year, but owing to the small response the function was abandoned. In June last the annnal exhibition of R.I.B.A. prize drawings was held at the School of Art, Princess Square, and was appreciated by many. An invitation by the ex-president of the society, Mr. Charles King, F.R.I.B.A., to high tea and a visit to Cotehele, through the kindness of the Earl of Mount Edgcumbe, had, on account of the general election, to be postponed. Mr. King, however, kindly promised to renew the invitation, when it was hoped a goodly number will avail themselves of the opportunity of being present. On November 21st last, Mr. Tait, the president of the parent society, kindly paid them a visit and delivered a lecture on the architecture and sculpture of Greece, which was highly appreciated. The council took the opportunity of expressing a hope that more lectures would be forthcoming during the winter session, and it was also hoped that further contributions would be made to the library. Mr. Shires also presented the financial statements, which, after making a liberal allowance to the Society's library, showed a good balance in favour of the Society. The reports having been adopted, the election of officers to serve on the council resulted as follows:—Chairman, Mr. Charles King; committee, Messrs. Parker, E. Coath Adams, W. H. May, M. A. Bazeley and A. E. Lethbridge; honorary secretary and treasurer, Mr. B. Priestley Shires; librarian, Mr. W. H. May. In a discussion that followed it was maintained that architectural work in connection with the public bodies of the town should be more evenly distributed.

The Erection of a New Royal Residence at Cromer is looked on as a certainty. Lord Suffield has been spending Whitsuntide at Cromer, and, subject to the King's approval, the site for such a residence has been selected. It lies between the Royal Links Hotel and Lord Hillingdon's fine house, and is near the famous golf links.

THE A.A. DINNER.

THE annual dinner of the Architectural Association was held at the Criterion Restaurant on Friday evening last, Mr. W. Howard Seth-Smith presiding. The company numbered nearly one hundred, and included Sir George Young, Major-General Sir H. Trotter, Mr. William Emerson, Mr. Aston Webb, Mr. John Slater, Mr. E. S. Prior, Professor Simpson, Mr. A. W. Soames, M.P., Mr. R. M. Beachcroft, Mr. F. T. Baggallay, Mr. Henry T. Hare, the Master of the Plumbers' Company, Professor R. Elsey Smith, Professor T. Roger Smith, Mr. G. L. Gomme, Dr. Isambard Owen, Dr. W. J. Collins, Mr. R. W. Schultz, Mr. E. Guy Dawber, and Mr. Francis Hooper. After the toast of "The King and the Royal Family" had been given, "The Church and the Legislature" was proposed by the president. In responding, Mr. A. W. Soames said he thought he was the only member of the House of Commons who represented art in any degree. This was a reflex of the attitude of the nation towards art. He thought, however, that latterly there had been a very decided improvement as regards the manner in which various Governments had dealt with this question. He considered that the plan adopted by the Government for the new offices in Whitehall was a right one; in his opinion it was best to select one man and to give him a free hand. When we had an educated artistic public, then we would have an educated artistic parliament. Mr. John Slater proposed the next toast, that of "The Army and Navy," and, in doing so, he said that the connection between the army and architecture was not quite so remote as might be imagined. The War Office had a great work to do in providing buildings such as barracks, and the training appurtenant to such work was excellent. Mr. Ingress Bell had received his training in the War Office. Major-General Sir Henry Trotter replied. Mr. Baggallay proposed "The Royal Academy and the Royal Institute of British Architects." These two bodies, he said, so subject to sporadic criticism, were the guiding lights of architecture, and a great deal was due to them for the valuable assistance they rendered to the architural profession. In responding, Mr. Aston Webb remarked that there was one subject which both bodies had equally at heart—that of education. Of the thousands who thronged the galleries of Burlington House every year, few remembered the work which was going on under their feet, but after the brilliant three months were over the education still continued of those young men and women whose ambition it was to fill the galleries above with their works. The Architectural Association was starting a new scheme of day classes, and he thought they would be successful. They would not necessarily produce good architecture. But good architecture was founded on knowledge, and he did not think anyone would deny that knowledge in architecture was not needed just as much as in any other subject. The danger lay in the number of courses being started in various parts. If these could be concentrated it would be very advantageous. He would like to see the scheme of the Architectural Association and that of the Academy working conjointly on harmonious lines. Mr. William Emerson, who also responded to the toast, spoke of the rapidity in work required of an architect practising at the present day. The toast of the evening, "The Architectural Association," was proposed by Mr. W. J. Locke, and replied to by Mr. H. T. Hare and the president. Other toasts were, "The London County Council," proposed by Sir George Young and seconded by Dr. W. J. Collins; "Lecturers and Instructors," proposed by Professor Simpson and replied to by Professor F. E. Hulme; "The Guests," proposed by Professor T. Roger Smith and replied to by Mr. G. L. Gomme and Dr. Isambard Owen; and "The Committee and Officers," proposed by Mr. F. T. W. Goldsmith and responded to by Mr. G. B. Carvill. During the evening songs were sung by Mr. S. Constanduros, and humorous sketches were given by Mr. Harrison Hill. A photograph was taken by Messrs. Fradelle and Young.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Right to Insert Window in Wall.

FAREHAM.—J. H. M. writes: "I have a dark passage and want to put a small fixed light in the outer wall so as to secure light. My wall is 7ft. clear of my neighbour's property. Can he oppose my doing so?"

No. You can insert a window in your outer wall if you so desire, but your neighbour may construct a hoarding on the boundary of his property immediately opposite the new window, so as to prevent you obtaining any right of light from his property. T. E. C.

Payments to Adjoining Owners.

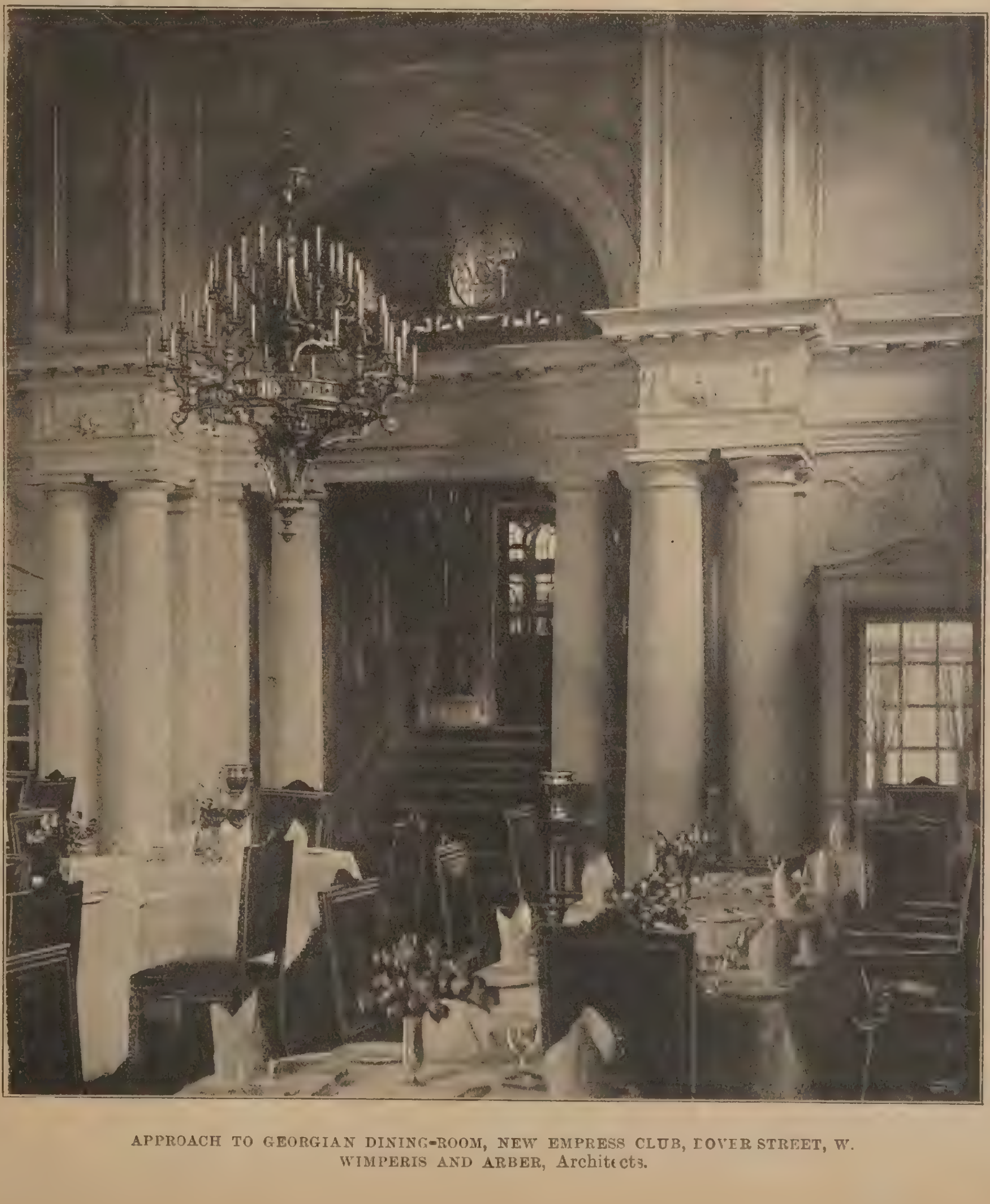
LONDON, E.C.—J. W. R. writes: "In a party-wall case, decided within the past six months, the building owner rebuilt his premises larger than before. He applied for part-payment from the adjoining owner for the rebuilt party wall, but the adjoining owner refused to contribute. The court upheld him. Kindly express an opinion on this matter."

The decision is perfectly sound. The adjoining owner cannot be made to pay for work undertaken without his consent. A. O. H.

Hot-Water Supply.

LONDON, S.W.—G. A. P. writes: "In a case where the circulating tank or cylinder is placed near to and heated by the kitchen range boiler —(1) Is it sufficient for the level of bottom of cylinder to be just clear of the top of the boiler? If not, what should be the least height at which cylinder is fixed above the boiler? (2) At what exact height in cylinder should flow from boiler enter same? (3) At what exact height in cylinder should the return to cylinder enter same?"

(1) Yes. The greater the height the more rapid the circulation, and *vice-versa.* (2) and (3)



APPROACH TO GEORGIAN DINING-ROOM, NEW EMPRESS CLUB, DOVER STREET, W.
WIMPERIS AND ARBER, Architects.

There is no fixed law or rule. It is more a question of convenience. The return should be at the bottom of the cylinder and the boiler: the flow from the top of the boiler to any convenient part of the cylinder. A pamphlet entitled "Heating by Hot Water," by Mr. Walter Jones, is published by Messrs. Crosby, Lockwood & Son, 7, Stationers' Hall Court, E.C., at 2s. 6d. nett (post free 2s. 9d.). This will doubtless be of use to you.

Cost of Buildings.

BURY.—SAPPER writes: "Are there any books giving particulars for determining approximate estimates quickly, *i.e.*, different classes of building per ft. cube or other unit, hospitals per bed, infirmaries per inmate, &c.?"

Querist cannot do better than consult an article on "The Cost of Buildings" on p. 48 of our issue for August 22nd last. For full pricing, see Stephenson's "Estimating" (to be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C., price 5s. 6d.).

Books of Detail Drawings and Books on House Drainage.

LONDON, S.W.—QUERIST writes: "Kindly recommend the best books containing detail drawings (to scale) of the following styles of architecture peculiar to England: Greek and Roman orders as described by W. H. Leeds, Norman or Romanesque, Early English or First Pointed, Decorated or Middle Pointed, Perpendicular, Florid or Third Pointed. Kindly also mention a good book on house drainage and sanitation."

Colling's "Details of Gothic Architecture" (nett £2 2s.); "Churches of the Nene Valley," by Edmund Sharpe, John Johnson and A. H. Kersey (£2 4s.); Gotch's "Architecture of the Renaissance in England" (£8 8s. nett); Triggs' and Tanner's "Architectural Works of Inigo Jones" (25s. nett); Abbey Square Sketch-Book (3 vols.), Architectural Association Sketch-Book (several volumes, £1 1s. each). Middleton's "House Drainage" (3s.) and Coleman's "Sanitary House Drainage" (6s.) are both useful books. These can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Construction of Large Water Tanks.

LONDON, E.C.—J. E. writes: "Since the accident to the large cast-iron tank at the West Ham Workhouse I have been desirous of studying the construction of large wafer tanks built of cast-iron flanged plates, but I find a great dearth of information on this subject. In Laxton there is a reference to the weight of plates and the width of flanges, and in Molesworth's pocket-book (p. 314 of 24th edit., 1900) are some equations and formulæ. Could you name a book which gives full particulars of the construction of these tanks?"

The writer cannot recall the title of any book giving information on designing large tanks, and his "Molesworth" is an earlier edition than the one referred to. There was an article by P. Hutchisen in "The Practical Engineer" for December 30th, 1898, on cast-iron tanks, giving some useful information and formulæ applicable to tanks of medium size. Tanks of large area require carefully supporting, so as not to have unequal settlements to rack the joints, and tanks of great depth require considerable judgment in placing and apportioning the size of the ties. HENRY ADAMS.

Examination Questions.

NEWCASTLE-ON-TYNE.—RYE HILL writes: "Kindly answer the following questions, set at various R.I.B.A. Intermediate Examinations: Define velarium, monopteral, merlon, bratishing, and parclose screen. In studying classic ornament, what indications have you seen that its forms were influenced by such practical considerations as weathering?"

These columns are only intended to give aid in problems of special difficulty, and it is too much to expect us to give answers to examination questions, particularly like those above. The desired information can easily be found by consulting the ordinary text-books or reference books.

Cost of Cement-Concrete Heads and Sills.

BLACK DYKE.—J. T. writes: "What is the cost per lineal foot of 10in. by 7in. cement heads and sills for 3ft. and 4ft. openings, to stand all kinds of weather? Also the cost of 2½in. cement flags per super yd.?"

This enquiry is not sufficiently definite, as the cost is so greatly dependent upon the cost of materials and the distance of carting them, wages, proportions of aggregate and matrix, finish, and shape. Querist cannot of course mean "cement" heads, sills or flags; cement-concrete is always used. As an instance of the difference in cost of aggregates we may mention that granite and stone chippings, furnace slag, coke-breeze, sand, broken tiles, &c., are all (and generally) used. The rough actual cost in your district of concrete heads and sills 10in. by 7in. for 3ft. and 4ft. openings, made in the proportions of about one part of cement to three of slag or sand, would be about 1s. 6d. per ft. run; 2½in. concrete slabs would cost about 5d. to 6d. per ft. super., if made to wear well.

Colouring Tracings.

PERPLEXED writes: "Is it best to colour drawings before mounting them on strainers, or after? If the latter, how can one obtain a rest to steady the hand, it of course being impossible to lean on the stretched paper?"

It is best to colour drawings after mounting them on strainers. A mahl stick can be used as a rest for the hand. With tracings on cloth the colouring is always done on the opposite side to that on which the ink is used; it is therefore somewhat difficult to avoid the colours or ink running, but the secret of success is to use a stiff starch on the mount, and apply thinner starch with a flat camel-hair brush to the tracing, *never touching any part a second time with the brush;* the tracing should be layed down on the shortest side and dabbled into position, but when once laid it must not be moved, or smudging will result.

Hinges for Church Door.

REDDITCH.—C. D. writes: "Would double-action helical spring hinges and blanks be suitable and strong enough for 2½in. framed and ledged **V**-jointed battened doors, hung folding, for churches? If not, what make would you suggest?"

The helical spring hinges are good springs considering their cheapness, and we have seen several used for internal doors in churches. These springs are not, of course, so good as more expensive floor and overhead check springs, and the helical springs constantly break where subjected to rough wear, such as by the doors being swung violently back; but this would hardly happen in a church. The springs with noiseless checks do not slam the doors, however; they are expensive, and cost between 25s. and 40s. each (according to quality) for doors of the size you require (4ft. by 7ft. 6in.).

Churches to Measure for R.I.B.A. Examination.

LONDON, N.—E. writes: "Can you recommend St. Giles in the Field, High Street, Bloomsbury, as a suitable church for measuring and drawing for the R.I.B.A. examination? If this is not a good church for the purpose, name one which is."

Probably Hawksmoor's great church of St. George, Bloomsbury, would be better, as being the principal work of one of Wren's pupils, but it is doubtful whether either is of sufficient importance or magnitude if it be intended to compete for the "measured drawings" prize, while they are larger than would be necessary if mere "testimonies" for the final examination be intended. Both churches should be first carefully inspected with an eye to the possibility of measuring them without the use of expensive scaffolding, and the vicar of the one selected should then be consulted for permission and any information in his possession obtained. G.A.T.M.

Architectural Training.

REQUIRE writes: "I am desirous of studying the art of architecture and the 'classics,' also the construction of certain parts of buildings calling for special skill. Kindly recommend what course to adopt and what books to study. I desire to go in for first-class work."

There is no book that will teach you how to design well, although many purport to do so; architecture depends so much upon site, situation, material and ideals and traditions that the best study is buildings themselves. However, to give some method to one's study, the following books are helpful: Ruskin's "Seven Lamps of Architecture" and "Stones of Venice," the chief articles in Viollet le Duc's "Dictionnaire Raisonné de l'Architecture," Walter Crane's "Bases of Design," Ferguson's "History of Architecture" and Blomfield's "Renaissance Architecture." Rivington's "Building Construction" is of course a standard book on the subject. See the answer to an enquiry under the heading "Theoretical Mechanics" in our issue for March 20th last. Mr. B. T. Batsford, of 94, High Holborn, W.C., publishes a useful list of standard books upon particular subjects.

Right of Light.

SUNDERLAND.—ANXIOUS writes: "I want to build on a corner site which has never been built upon. The properties on two adjoining corners are more than twenty years old and are two storeys high, with a half basement above the street level, and windows facing my corner from basement to first floor. Could I be sued for obstructing the adjoining light if I built my property three storeys and a half above the street level?"

The owner of the adjoining properties (marked B on querist's sketch, not reproduced) could certainly bring an action for infringement of his rights of light; but it is by no means so certain that he could sustain it. In order to obtain either an injunction or damages he would have to prove that his light would be materially affected to the injury of his trade or business, or that in some way material damage having a definite money value would be done to him. This, having regard to the width of the roads, it would be most unlikely that he could succeed in doing. If, however, an action should be brought, it would be better to compromise it in some way, if it could be done by some small money payment, than to be put to the trouble and expense of contesting even a presumably sure case. G. A. T. M.

Cemetery and Mortuary Buildings.

CARDIFF.—NEVAR writes: "Which is the correct position for the bier in a small cemetery chapel to accommodate 100 persons, and in what position would the mortuary be placed, and the size of same?"

In most cemetery chapels the bier is placed so that the coffin rests longitudinally, with feet towards the east, in the very centre and in front of the communion rail. Seats in many cases are ranged along the N. and S. walls, but it is becoming more usual that they should also face eastwards and be reached from the wide central passage in which the bier stands, while the bier often consists of movable trestles. Another recent improvement has been that the bier should rest in a transept separated from the chapel itself by a glazed screen, and this is especially useful where several interments may take place simultaneously, as it can be made large enough to accommodate as many as eight or ten coffins at once without incommoding the congregation. The mortuary, if a separate one be provided, is only needed for the resting of a body which has been brought from some distance till the mourners arrive, and, as a rule, need not have room for more than about two and the bearers. It should be placed so that the coffin can be readily taken in from a covered carriage-way, and as readily transferred to the chapel. F.

Qualifications for a Land Surveyor and Estate Agent.

DUMPY LEVEL writes: "What are the necessary qualifications for entering, and the duties in, the office of a land surveyor and estate agent to a large railway company?"

The estate agent of a large railway company has the management of its always large property in houses, lands, &c., the collection of the rents, supervision of repairs, and the negotiations for purchases and sales, which are often upon a large scale. The "agent" himself is generally a man who has risen from the bottom of his own department, and he has the right of appointing and dismissing his subordinates, so that a personal introduction to him is almost necessary to anyone who may wish to enter his office. As a rule lads are preferred who can enter as copying clerks or office boys at some such salary as 10s. per week. From this they can rise slowly from grade to grade, but "only" a very few of the most capable can ever expect to receive more than £200 a year, in addition to the free passes on the line both for residence and holidays which are enjoyed by mutual arrangement between the companies by all railway officials. G. A. T. M.

The Refusal of Plans by Local Authorities.

NIL DESPERANDUM writes: "I am obliged for your reply to my query. Unfortunately, there is a misunderstanding, and no doubt it will alter your opinion. The house that I want to erect stands in the same urban district as the sewer, and the pavement is also in the same district; but the roadway is a highway, and in the adjoining rural district. The pavements within the urban district have been laid with cement slabs, and they refuse to have them disturbed. Are not the urban district obliged to pass my plan if I show the drain under roadway (highway) and ask to cross the pavement and connect to sewer in the usual way? If so, do you think the Local Government Board would consider my application favourably, if the adjoining rural district refuse me permission to run under the highway?"

From a consideration of the additional facts submitted, it would appear that you have good grounds for claiming permission to carry your drainage into the adjacent sewer. If the sanitary authorities still refuse your application, then lay full particulars of the whole case before the Local Government Board, at the same time forwarding a plan (drawn to scale) showing the district boundaries, the distance from the proposed house to the sewer, and other similar details directly affecting the question.

T. E. C.

GODALMING.—J. H. N. writes: "In his reply to 'Nil Desperandum' on page 308 of your issue for May 22nd, has not 'T. E. C.' forgotten section 22 of the Public Health Act, 1875? An owner or occupier *without* the district of a local authority has the *right* to cause his drains to communicate with the sewer of the local authority on agreed terms, or, in case of dispute, on terms to be settled, at the option of the owner or occupier, by a court of summary jurisdiction or by arbitration in the manner provided by the Public Health Act."

I am obliged to "J. H. N." for the correction. The precise terms of the clause in question were not before me at the time of writing. To avoid any misconception, section 22 of the Public Health Act, 1875, is now given in full: "The owner or occupier of any premises without the district of a local authority may cause any sewer or drain from such premises to communicate with any sewer of the local authority on such terms and conditions as may be agreed on between such owner or occupier and such local authority, or as in case of dispute may be settled, at the option of the owner or occupier, by a court of summary jurisdiction or by arbitration in manner provided by this Act." T. E. C.

Examination for Clerks of Works.

TUNBRIDGE WELLS.—GNEISS writes: "Is there any examination held by the R.I.B.A., or another body, for clerks of works?"

The Carpenters' Company hold an examination (next month, we believe). Full particulars can be obtained from Mr. Stanton William Preston, clerk to the company, Carpenters' Hall, London Wall, E.C.

Another Roman Pavement at Dorchester has been found. It was only recently a splendid specimen was found on the outskirts of the borough, and it has been carefully relaid in the County Museum. The latest find is of scarcely less interest, the floor being about 22ft. long and 7ft. broad. It was laid bare during some excavations in a road known by the name of Icen Way. The pattern is not very elaborate, but the colouring is good.

NORTH-EASTERN HOSPITAL.

THE original North-Eastern Hospital consists of a group of temporary buildings hastily erected in 1892, in face of an epidemic of scarlet fever, and intended only to last for one year. The area of the site was then 19 acres, but additional land has since been purchased, and the total is now about 33 acres, including a recreation ground, not shown on the accompanying plan, situated on the south side of the railway.

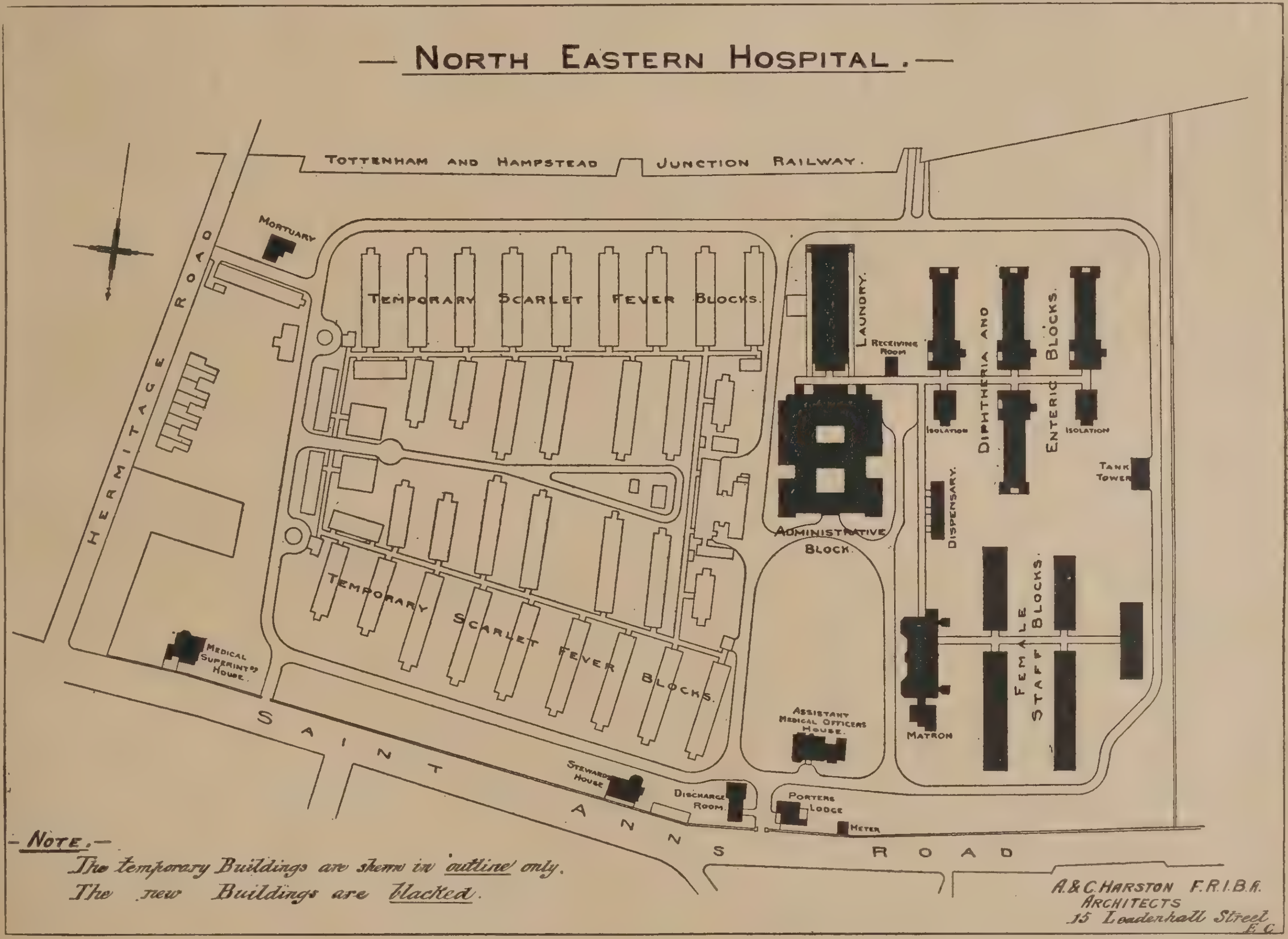
The new buildings which form the first section of the proposed permanent hospital are shown black on plan. They consist of an administrative block, laundry, staff quarters, medical superintendent's and steward's houses, porter's lodge, receiving and discharge rooms, mortuary, dispensary, four diphtheria and enteric blocks, two isolation blocks, and tank tower.

The normal number of beds in the reconstructed hospital will be 548. The new buildings provide for diphtheria and enteric patients and eight isolation beds. They also include accommodation for the entire staff of the future hospital. The buildings have been designed by Messrs. A. & C. Harston, architects, 15, Leadenhall Street, E.C.; and erected by Messrs. McCormick & Sons, whose contracts include all engineering work except kitchen and laundry fittings. The contract amounts were: Main contract, £113,642; laundry, £8,865.

The kitchen fittings were provided by Messrs. C. Kite & Co., whose contract amounted to £1,050; and the contract for laundry fittings has recently been let to Messrs. Bradford & Co. at £4,580. The medical superintendent's residence was built by Messrs. Wm. Johnson & Co., of Wandsworth Common, at a cost of £1,968.

The North-Eastern Hospital is about six minutes' walk from West Green Station (G.E.Ry.), and about nine minutes' walk from St. Ann's Road Station (Midland Ry.).

It was inspected by members of the Metropolitan Asylums Board on May 18th.


— NORTH EASTERN HOSPITAL .—
TOTTENHAM AND HAMPSTEAD JUNCTION RAILWAY.
MORTUARY
HERMITAGE ROAD
TEMPORARY SCARLET FEVER BLOCKS.
LAUNDRY.
RECEIVING ROOM
DIPHTHERIA AND ENTERIC BLOCKS.
ISOLATION
ISOLATION
TANK TOWER
DISPENSARY.
ADMINISTRATIVE BLOCK
TEMPORARY SCARLET FEVER BLOCKS.
MEDICAL SUPERINTENDENT'S HOUSE
FEMALE STAFF BLOCKS.
MATRON
ASSISTANT MEDICAL OFFICERS HOUSE.
STEWARDS HOUSE
DISCHARGE ROOM
PORTERS LODGE
METER
SAINT ANNS ROAD
- NOTE.—
The temporary Buildings are shewn in outline only.
The new Buildings are blacked.
A.&C. HARSTON F.R.I.B.A.
ARCHITECTS
15 Leadenhall Street E.C.

Engineering Notes.

A New Bridge over the Tyne at Haddington, named in memory of the late Queen Victoria, was opened recently.

The City Infectious Hospital, Coventry, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves with descending smoke flues and patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

Portsmouth Tramways.—The Mayor and other members of the Corporation at Portsmouth, having had an interview with the officials of the Local Government Board with respect to an application for a loan of £600,000 for the purchase of the new electric trams, report that the consent of the Board will be received very shortly.

Bridge Improvements at Cardiff.—One of the improvements which the Cardiff Corporation has in contemplation is the widening and straightening of the bridge known as the Hayes Bridge, at the top end of Bute Street. Property has been purchased in order to run Bridge Street into Mill Lane without the awkward angle which now exists. The borough engineer, Mr. Harpur, has designed the ironwork of the parapets in patterns in the style of the Celtic or pre-Norman period. In his report Mr. Harpur said: "The curator of the museum, Mr. John Ward, F.S.A., has called my attention to the fact that His Majesty's Board of Education had made extensive grants to the museum for the acquisition of casts of pre-Norman monuments, with the view of their application to local art, and suggested that some municipal works should be carried out in the Celtic style. After considering the matter I concluded that this style would lend itself to cast-iron construction, and I have therefore adopted it for the parapets and end pillars of this bridge."

Street Lighting.—The Kitson Lighting and Heating Syndicate, Ltd., have fixed street lamps in Portland Place, W., on a new system. The Kitson Light is produced by combustion of petroleum in a lamp designed for the purpose, in which the calorific value of oil is converted into light by means of ordinary incandescent mantles. The reservoir from which the oil passes by means of a metallic tubing, may be placed at any convenient distance from the lamp, or it may be close to it. The conducting tubes are very small, varying from $\frac{1}{16}$in. to ¼in., and are encased in wood coverings in a similar manner to electric light wires. The chief advantage claimed for the system is its cheapness. It is stated that while an electric light of 1,000 candle-power costs 1⅔d. per hour, a Kitson light of the same intensity costs only $\frac{5}{10}$d. A feature is made of the fact that as each lamp-post contains its own reservoir, the nuisance caused by the constant tearing up of the roadway for the repairs of gaspipes and electric wires is done away with, and that in this alone a very large annual outlay could be saved by a general adoption of the new system of oil lighting. The lamps in Portland Place are twelve in number, and they replace some forty gas lamps, with which the thoroughfare was formerly illuminated.

The Engineering Trade in 1900.—The Amalgamated Society of Engineers attained its jubilee in 1900, and the annual report for that year has just been issued, showing a membership of 87,672, and over £400,000 in funds. Mr. George N. Barnes, in the remarks as general secretary with which he prefaces the report, states that the year was one of uninterrupted prosperity to the society's trade. He further remarks: "By its support to trade and public movements the A.S.E. has materially contributed towards that equality of opportunity which is the aim of all industrial and social reform; and by the expenditure of vast sums of money in sick, unemployed, and other benefits it has spread over the broad back of the many burdens which might otherwise have fallen with crushing effect upon the shoulders of the few." The income of the society last year was £333,555, and the expenditure £234,194, showing a saving on the year of £99,361, and a total balance at the end of the year of £406,529, which is said to be "probably the largest sum ever held by any trade union." Of that balance, £127,143 stands to the credit of the superannuation fund, leaving £279,386 for benefit and trade purposes. The exports of steam-engines, machinery and millwork in 1900 did not quite reach the total in 1899, which was the highest on record. They represented a value of £19,621,557, or £32,000 less than in 1899. The only class which showed any considerable decrease of exports was textile machinery, which fell off during the year by nearly £600,000—namely from £6,803,948 to £6,211,918. The exportation of locomotives last year amounted to no less than £1,500,909, or double the value of such exports in 1894.

Correspondence.

Examination Questions in Building Construction.

To the Editor of THE BUILDERS' JOURNAL.

CARDIFF.

SIR,—I am greatly pleased to see a protest raised against what is, to say the least of it, a very unfair examination—I speak of the examination in building construction held on May 11th. I went in for it, feeling fairly confident in my knowledge of the work set out by the syllabus, having been working hard for three months every evening, but my efforts were wasted: and in this I am but voicing the opinions of the majority of the students at the Cardiff Technical Schools. The fault lies with the gentleman who set the papers. I am sure we are all greatly indebted to him for the thoughtful way he put the questions. The only thing was he became a little muddled after he had written them, and dropped a few honours questions in the advanced paper, and a few advanced questions in the elementary paper. I might venture to suggest perhaps that a petition should be started in each large town in the kingdom with the object of lowering the standard of the examination. I do not think we would be asking too much that anyone obtaining 60 per cent., or even 50 per cent., should be awarded a first-class certificate; while 45 per cent. should be quite high enough to obtain a second-class certificate. I quite foresee, however, that there are great difficulties to the scheme. We do not wish a paper to be easy: all we require is that it shall be straightforward, not tricky and ingenious.—Yours truly,
A STUDENT
(CARDIFF TECHNICAL SCHOOLS).

To the Editor of THE BUILDERS' JOURNAL.

SOUTHPORT.

SIR,—I fully concur with your correspondents respecting the examination in building construction. As to the time allowed, four hours may have been long enough originally, but for such questions as those set this year I think that time rather too short, especially for students in the advanced and honours stages. Another point I would like to mention is that, in my opinion, the student in and about London (and the south generally) seems to have an undue advantage over the Lancashire or North of England student. Everything seems to be looked at from the London standpoint by examiners. For instance, take a stock brick as known to the Science and Art Department and one as known and used in Lancashire, and note the difference; and numerous other examples could be cited. I think they should, as it were, meet halfway.—Yours truly,
ONE MORE STUDENT.

To the Editor of THE BUILDERS' JOURNAL.

DUBLIN.

SIR,—On reading "Another Student's" letter on page 319 of your last issue, I must confess I fail to see what grievance he has. He states that the questions are getting difficult to understand. Well, I trust the science of building is progressing, and not remaining at the Science and Art standard of, say, twenty years ago. Again, why object to a student being able to draw (correctly, I presume) the plan, section and elevation of a door in almost any position? As regards "Another Student" (No. 2), I think most persons will agree that a candidate presuming to be able to work an Honours paper who cannot determine whether the height of a shop front is 12in. or 12ft., owing to a misprint or otherwise, deserves to fail. This student states that tables are required to work chimney-shaft questions. I say, No. I admit three constants are required for the cases usually occurring, but constants are required for every question of strength. With reference to the roof question, I am unable to express an opinion, as I have not seen the paper. It may not turn out so formidable as "Student" imagines. There may be something to be said against the syllabus not embracing the questions set; still these examinations should be looked at from a higher point of view than merely securing a "pass"—they should be considered as aids to professional education.—Yours truly,
S. E. D.

Masters and Men.

The Strike at Yarmouth has been settled by a compromise, the masters giving an advance of ½d. per hour.

The Masons' Dispute in Arbroath has been amicably settled. The dispute arose over the intimation of the masters' intention of reducing the present wage from 8d. to 7½d., and their refusal to sign the by-laws of the Operative Masons' Society. The masters have now agreed not to make any reduction in the present wage.

The Strike at New York has been settled. After a conference with the Arbitration Board the Bricklayers' Unions and the Masons' and Builders' Association announced that the lock-out and strike which began on May 17th were mutually declared to be at an end, the employers making certain concessions.

The Strike at Newark of operative bricklayers and builders' labourers, which commenced on May 1st, is still proceeding. About 200 men are affected. The bricklayers withdrew their demands for an increase of ½d. per hour, and the employers agreed to sign a code of working rules for the district. With regard to the builders' labourers this section insisted upon an advance in wages of ½d. per hour, viz., from 5d. to 5½d. per hour; and the employers agreed to a code of working rules for the district. A meeting between representatives of both sides failed to arrive at a settlement, and the strike has been carried on with vigour and determination by both sides. The bricklayers are reported as working with non-society labour, where it has been introduced, although some fifty are unemployed owing to the labourers continuing the strike. Three firms are working, having conceded an advance of ½d. per hour to the labourers; two others are reported as partially employed. Most of the firms are, however, standing. The labourers are connected with the Federated Society of Builders' Labourers of Great Britain.

Keystones.

A New Presbyterian Church at Acrefair has been built at a cost of £1,100. A new organ has also been provided at a cost of about £125.

New Liberal Club Premises at Woolston are being erected from plans drawn by Mr. J. H. Blizard (Messrs. Lemon & Blizard). The builders are Messrs Hinton Bros.

A Memorial to General Wauchope has been erected at Niddrie, in the shape of a Celtic cross of Aberdeenshire granite, in front of Niddrie Mill School.

Mr. W. J. Morley, F.R.I.B.A., of 269, Swan Arcade, Bradford, has taken his son, Mr. Richard Morley, into partnership, and his practice will be carried on in future under the style of W. J. Morley & Son.

The Louvre Museum, Paris, has had five new rooms added to it, in which has been grouped a magnificent collection of French furniture of the seventeenth and eighteenth centuries. The articles have been drawn from the relics of the Palaces of Versailles, Saint-Cloud, Bellevue, Meudon, Fontainebleau, Compiègne, the Louvre itself, and the Chateau de Louveciennes, which was the home of Madame Du Barry, and have consequently a great historic value. One of the rooms is devoted to the period of Louis XIV., another to Louis XV., and the other three to the period dating from the end of the reign of that monarch to the Empire, and which is generally termed Louis XVI. style.

A New Market Hall at Ilfracombe has just been erected at a cost of £7,000.

A New Liberal Club at Baxenden, Accrington, has been erected at a cost of nearly £2,000. Mr. Haywood was the architect.

A New Hotel at Buxton has been opened by Messrs. Spiers & Pond, Ltd. This building—the Empire Hotel, as it is named—on a commanding site to the west of the town, is the largest establishment of the kind in Buxton. It possesses accommodation for upwards of 300 guests.

A New Grand Public Hall for Dulwich is being erected on a freehold site in Grove Vale, East Dulwich. The building, which will include large and small halls, masonic temple, club-rooms, &c., is to be completed in time for the coming winter season, commencing in November next. The hall is to be called the New Imperial Hall.

A Monument to Rosa Bonheur has been unveiled at Fontainebleau, near the hamlet where she lived for many years. It consists of a bronze bull—an enlarged facsimile of one of her sculptures—standing on a pedestal decorated with bas-reliefs representing some of the painter's best known work, and her portrait. The monument was executed by Rosa Bonheur's brother, M. Isidore Bonheur, and her nephew, M. Peyrol.

The Famous Weaving Factory of the Gobelins in Paris is about to begin one of the largest and most important pieces of tapestry that has ever been made. It is a work destined to decorate the Mairie of the Thirteenth Arrondissement, and it is estimated that it will take ten years to finish. M. Jean-Paul Laurens has executed the design, which represents the "Triomphe de Colbert," Louis XIV.'s all-powerful Minister.

Keighley Public Library Competition. — Mr. Leonard Stokes, F.R.I.B.A., has completed his task of adjudicating upon the 146 competitive designs for the new public library. The first premium of £50 is awarded for the design submitted by Messrs. Arthur E. McKewan & James A. Swan, of Newhall Street, Birmingham; the second, of £30, for that of Mr. J. S. Gibson, 4, Gray's Inn Square, London; and the third, of £20. for that of Mr. Thomas Davidson, A.R.I.B.A., Great Ormond Street, London. In adopting the awards, the Free Library Committee recommend the Council that the premium for the first set of designs shall not be merged, as intended, in the architect's commission, and that the successful set shall be adopted.

A New Church for Newington, Hull, to be dedicated to SS. Peter and Mary, is being erected on the Hessle Road, near Hawthorn Avenue. The church consists of nave and aisles, with porches at each end, facing the Hessle Road, and there is also to be a baptistery at the west end. The chancel is intended to be finished with a circular apse, and has a large double vestry on the north side, and on the other side the organ chamber. The church when completed will accommodate 558 adults, but at present the funds only admit of the completion of the nave and aisles. The church is to be built of red bricks with terra-cotta dressings, and is to be roofed with Broseley red tiles, and the style selected is Norman. The architects are Messrs. Brodrick, Lowther & Walker, of Hull and Bridlington.

Durham's New Technical College.—The new Johnson Technical School, which has been erected in South Street, Durham, was opened recently. Messrs. George Gradon & Sons, of Durham, were the contractors, their tender being £4,642. A site was obtained at the bottom of South Street, and here the new school was erected. The new school occupies a space of 77ft., with a width of 46ft., and is built of red brick, with red tiled roof, the entrance doorway being of stone. From the roof rises a turret which also forms the ventilating shaft, which has been carried out on Boyle's system. There are in all three storeys. Facing South Street are several large bay windows, with a large oriel window facing the river. The top storey is intended for art, the middle floor for chemistry and engineering, and the basement for physics, cookery, &c. In the basement there are a kitchen, store-room, physical laboratory, dark-room for photographic purposes, science class-room, heating chamber, &c. The whole of the rooms are approached by a cement staircase from wide corridors. The building throughout is heated by hot water.

The German National Monument to Prince Bismarck was unveiled last Monday.

The Memorial to the Late Dean Ingram, of Peterborough, is proposed to take the form of the completion of the restoration of the Cathedral west front.

A New Church for Milton, Sittingbourne, is being erected, to be dedicated to St. Mary. The cost will be about £2,200. The architect of the church is Mr. W. Philip Day, and Mr. Harry Gardler, of Milton, is the builder.

A New Foresters Hall at Cranswick has been erected opposite the village green, and not far from the railway station. The inside measurements of the hall are 70ft. by 29ft., and it has an entrance, ticket offices and a small gallery. The roof is of open timber work. The front elevation is of Accrington red bricks, with stone dressings, a deep panelled frieze of stone running across the front.

German Sculpture.—A great marble statue of Emperor William I. has just been finished and will be placed in front of the new university of Strasburg. It is the work of Zambusch, the eminent Viennese sculptor. It is proposed to erect a Shakespeare statue opposite the celebrated double monument to Schiller and Goethe, near the theatre at Weimer. This is suggestive of the extent to which Germans have come to regard Shakespeare as a possession of their own.

A Russian People's Palace.—The erection of the "Czar Nicholas II. People's House" in St. Petersburg is the latest attempt of the Russian Government to provide the masses with an antidote to the drinking shops. The Russian institution is said to have been modelled on the lines of the People's Palace in London. The building contains a theatre, with room for 2,500 persons, in which "dramas of historical patriotic character" are to be performed The entrance fee is ten kopecks for civilians and five kopecks for soldiers.

The Cornish Craft Guild is the name of an organisation which has just been formed, and the members have for their aim the designing and creating of beautiful objects possessing practical utility. It is not in the ordinary sense a commercial concern. The capital required to start has been lent gratuitously, and after deduction of necessary expenses the whole of the money obtained for the finished articles will be divided among those whose skill and labour have created them. At first the guild will give its attention almost entirely to working in wood, brass. copper and silver, and will be pleased to submit designs and estimates on receiving statements of requirements. The hon. secretary of the organisation is Dr. Roberts, Hayle, Cornwall.

A New Town Hall for Batley.—The borough surveyor of Batley, Mr. O. J. Kirby, has received instructions from the general works committee to raze the Market Hall to the ground, and to lower the Market estate in order to provide a site for the new town hall, which is to be erected at a cost of about £50,000. About 80,000 loads of soil, exclusive of the stone and débris, will have to be removed, and it is to be conveyed in trucks on a specially-erected railway, over a bridge 18ft. high, into the valley on the low side of the football field. The new road to Mount Pleasant will thus be made contemporaneously with the clearance of the Market estate. This will be the beginning of a number of public improvements estimated to cost the ratepayers of Batley about £120,000, including the outlay on electric tramways.

The Proposed Charlotte M. Yonge Memorial.—The following suggestions as to the proposed memorial were considered recently at a public meeting: A reredos in the Ladye Chapel of Winchester Cathedral; the completion and equipment of the new Southern Cross (Melanesian Mission) ship; sanctuary furniture for the same; the endowment of Otterbourne Schools; a reredos windows or an organ for the church of St. Matthew, Otterbourne; and a scholarship at Keble College, Oxford. It was unanimously resolved that a worthy memorial should be placed in Otterbourne Church, and a substantial majority also voted in favour of the proposal that a reredos should be placed in the Ladye Chapel of the Cathedral at Winchester. For these two schemes, therefore, an appeal will eventually be made to the public.

A New Congregational Church at Harringay, N., to cost £5,000, is being built at Allison Road, Green Lanes.

Mr. Edward A. Gruning, vice-president R.I.B.A., has been appointed by the council of the Institute to fill the seat on the Tribunal of Appeal left vacant by the death of Mr. Arthur Cates.

A Bishop on Church Reparation.—The Bishop of Winchester, through his secretary, writes to a correspondent that he "is not of opinion that public opinion in England desires to see the usefulness or dignity of our cathedrals impaired; and the present condition of funds in most of the cathedral chapters is such as to cause serious apprehension as to what the issue may be."

Abbey Dore Church, Herefordshire, is proposed to be repaired. The church is a unique example of a Cistercian presbytery, and forms the eastern section of the Abbey Church, founded in 1147 for the White Monks. Mr. Roland W. Paul, who has been consulted, states that the main walls are sound, but that some portions of the building are in a dangerous state, the upper part of the tower being seriously out of position.

The New Church of St. James's, Muswell Hill, was consecrated last week. The original church was a somewhat uncomely building, and in recent years has become too small for the rapidly increasing population around it. It was, therefore, decided to erect a better and larger building in its place, and at right angles to it, more room being obtained by the transference to the Ecclesiastical Commissioners of a portion of the vicarage garden. The new building consists of the chancel, organ chamber and vestries, morning chapel, and two bays of the nave. A sum of about £8,000 has been spent upon it, and it will require another £7,000 to complete the building, a work which will be taken in hand as soon as the old church is demolished.

The New Street from the Strand to Holborn will cause the demolition of a famous mansion on the west side of Lincoln's Inn Fields, which the London County Council have just come into possession of. It adjoins Sardinia Street, and was built in the reign of Charles II. for the Earl of Lindsey, from the designs of Inigo Jones. The right-hand room on the first floor was taken by Charles Dickens as the scene in "Bleak House" of the assassination of Sir Leicester Dedlock's lawyer, Mr. Tulkinghorn, but the painted ceiling, with the Roman soldier whose truncheon pointed downwards to the prostrate body of the lifeless solicitor, was thoughtlessly covered with whitewash a few years ago.

Presbyterian Church, Muswell Hill, N.—The design under motto New Era submitted for this church in a recent competition limited to five architects has been adopted, and the authors of the design, Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5 Clement's Inn, Strand, W.C., have been instructed to proceed with working drawings. The style adopted is a free treatment of the Perpendicular period of Gothic architecture. Externally the building is to be faced with whole white flints, the dressings being of red Costessey work. A bold square tower, terminating in a quaint spirelet, forms a prominent feature at the angle of the block, the site being at the corner of two roads. There are three bold and richly-moulded doorways in front, flanked by buttresses, and a seven-light traceried window in the central gable, and traceried work in the apex. The plan approximates in form to a Greek cross. The ceiling internally will be vaulted in wood, the large central vault being carried up higher than others for effect and better ventilation, and being carried upon clustered green marble columns, with moulded stone vases and carved stone capitals, and these support four main moulded arches and other smaller ones spanning to the wall. The windows will all be filled in with ornamental lead lights. Electric lighting and low pressure hot-water heating apparatus will be used. There will be seating accommodation on the ground floor for 750 persons, and in the front gallery for 100, making a total of 850, or a mixed congregation of about 1,000 persons. The estimated cost, exclusive of boundary walls and gates, is £7,218.

Trade and Craft.

Ironwork at the Glasgow Exhibition.

Messrs. Walter Macfarlane & Co.. of Saracen Foundry, Glasgow, have a noteworthy exhibit of art ironfounding at Stand No. 519 in the Machinery Hall at the Glasgow International Exhibition. Its minarets and central dome command the attention of everyone entering the Hall. Taking the form of a rectangular pavilion, it is supported by twenty ornamental pillars of varied design, which carry a variety of spandrels and arches. The treatment between the coupled columns at corners and centres, as well as the frieze, is harmonised, merging in richly-developed foliage—a reference to the Thistle, Rose and Shamrock. The upper portion of the exhibit rises from a moulded cornice, and consists of pediments, minarets and large central dome. The treatment of the pediments varies in each case. Crowning the one at the north end is an example of ornate casting, specially adapted to embrace a monogram and crest, while to complete the two sides there are signboards in wrought and cast iron. To relieve these and secure an effective terminal finish in the centres, a casting of the Royal Arms in full heraldic colours surmounts the one side, while a statuette of her late Majesty, supported right and left by the British lion, dominates the other. With a touch of the "Oriental" at the corners, rise four ornamental minarets formed of delicate open scrollwork, and enriched by fringed ornament, while the spire of each displays various types of the firm's finials. The main or central dome can only be adequately seen from beneath. The design and colouring of the painted and stained glass are pleasing. The internal effect of this central feature is enhanced by a combination of cast and wrought iron railing, panels, terminals, &c., and from this a series of electric-light fitments are suspended. The exhibit further embraces a variety of individual castings for various uses, such as railings and gates for villa and mansion, verandah and conservatory castings, lamp pillars and brackets for oil, gas and electric light. One example in this class is the base portion of the London County Council's new electric light pillar, specially designed for the Victoria Embankment. Among many other examples, a staircase with scroll railings, newels and lanterns occupies a central position on the stand. In addition there are sectional examples of iron drain pipes, bends, traps and gulleys, treated by the glass enamel process. Stable fittings are also shown ; and in this connection it may be mentioned that this firm have furnished the model farm buildings in the Exhibition grounds with their fittings, specially suited for farmhouse and ordinary stabling, and also with the "Byre" fittings. Besides the exhibit within the Exhibition buildings, Messrs. Macfarlane & Co. have erected on the site of the Old Fairy fountain in the grounds an example of their structural work in the form of a decorative or memorial fountain, having on it four life-size figures of Art, Science, Literature and Commerce. Their ornamental spiral stairs are found in various parts of the buildings, whilst throughout the grounds about sixty complete electric-light pillars and brackets are erected, having been lent to the Executive by the firm, who have also provided several drinking fountains for the use of visitors.

A Mechanical Potter.

Messrs. Rowley, Adams & Till, of Swadlincote, Burton-on-Trent, are introducing a very simple and ingenious machine for moulding lavatories, water-closets, sinks and similar goods. It consists chiefly of a rotary forming roller specially made to follow the irregular curves of the various appliances for which it is required. These rollers are used singly or in series, placed horizontally, vertically or obliquely. The rate of production is limited by the speed at which clay can be fed to the machine—the rolling is practically instantaneous. The clay is pressed up better than by hand work ; articles can be made by the machine which could hardly be produced otherwise, and all work is uniform in thickness, with a consequent saving of loss in the ovens. In making a lavatory basin on this machine the ordinary mould is placed upon the travelling table and covered with clay, and is then moved automatically beneath the plaster forming roller. The article is found on emerging from beneath the roller to be thoroughly well made. In the manufacture of smaller articles, such as oval and flat dishes, &c., a number of moulds are placed upon the travelling table together, the quantity produced by one revolution of the forming roller being therefore proportionate to the size of the table ; in some cases one or two dozen might be made at one movement. The value of labour-saving appliances is becoming more and more apparent, and this "mechanical potter" should therefore find an extensive market. Already it has been taken up by several leading firms.

New Companies.

Paving Co., Ltd.

Registered May 14th to carry on any financial, commercial, industrial or other businesses usually carried on by contractors for public works, &c. Capital £10 in £1 shares.

Hounslow Artizans' Dwellings, Ltd.

Registered May 15th. Capital £600 in £1 shares. The first director is P. E. T. Hibbert. Registered offices : 28, Victoria Street, S.W.

Contract Cartage Co., Ltd.

Registered May 14th to acquire the business of a carman and cartage contractor carried on by R. Cunningham at Gallyhill Brickworks, Church Crookham, Winchfield, Hampshire, as Thompson & Co., and to carry on the business of general carriers, railway and forwarding agents, contractors, horse dealers, &c. Capital £1,000 in £1 shares.

Colonial Ferro-Concrete Syndicate, Ltd.

Registered May 21st to acquire patent rights relating to improvements in the construction of buildings, warehouses, bridges, quays, embankments, &c., by means of steel or other metals embedded in or used in concrete and other substances. Capital £4,000 in £10 shares.

Luscombe & Son, Ltd.

Registered May 14th to carry on the business of builders, contractors, decorators, merchants, dealers in timber, hardware and other building requisites, &c. Capital £2,000 in £1 shares. The first directors are J. Chudleigh, E. G. S. Luscombe and E. R. Vincent.

Newey & Son, Ltd.

Registered May 17th to acquire the business of architectural wood and iron workers, metal craftsmen and electrical engineers carried on at 94, Vyse Street and 66 and 68, Upper Hockley Street by A. H. Newey. under the style of Newey & Son. Capital £10,000 in £1 shares. The first directors are W. J. Taylor, A. H. Newey, W. H. Booth and H. T. Buckland Registered office : 94, Vyse Street, Birmingham.

Lewis Lighting System, Ltd.

Registered May 17th to acquire and turn to account any patents, inventions, &c., relating to improvements in the production of acetylene gas. Capital £15,000 in £1 shares. The first directors are Major C. H. Tye and G. Goodland, C.E. Registered office : 57, Moorgate Street, E.C.

A New Primitive Methodist Chapel at Ryde, I.W., is being erected. The new buildings are situated at the conjunction of Well Street and High Street. There will be a new schoolroom under the chapel, providing accommodation for 350 to 400 children. There are also to be five well-lighted class-rooms. The chapel will seat 450 to 500 persons, all the sittings being on the ground floor. The contract price is £2,300, the purchase and retention of the land £700, which, with the furnishing, will bring the total up to about £3,300.

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THE MANAGER OF THE
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COMING EVENTS.

Wednesday, June 5.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Dr. W. de Gray Birch, F.S.A., on "Some Aspects of the Life and Times of Alfred the Great," and Dr. Russell Forbes on "The Tribunal Prætoris at Rome," at 8 p.m.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

CARPENTERS' HALL, LONDON WALL, E.C.—Exhibition of Works in Wood opens. Presentation of Prizes to successful exhibitors by Mr. C. Purdon Clarke, C.I.E., F.S.A., director of the Victoria and Albert Museum. 8 to 10.30.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Special Meeting at 8 p.m. Professor Baldwin Brown on "Durham, Hexham and Chesters."

ROYAL ARCHÆOLOGICAL INSTITUTE.—Professor W. Boyd Dawkins, F.R.S., F.S.A., on "The Exploration of a Sepulchral Cave at Gop, near Prestatyn, Flintshire," and Mr. E. W. Brabrook, C.B., F.S.A., on "Mediæval Lavatories," 4 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Ordinary Meeting at 8 p.m.

SOCIETY OF BIBLICAL ARCHÆOLOGY.—Professor A. H. Sayce, President, on "Recent Discoveries in the East." and Professor Dr. Wiedemann, on "Bronze Circles, and Purification Vessels in Egyptian Temples," 4.30 p.m.

Thursday, June 6.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m. Ballot for the Election of Fellows.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Second Conversazione at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

ROYAL INSTITUTION.—Professor Dewar, F.R.S., on "The Chemistry of Carbon," III., 3 p.m.

Saturday, June 8.

NORTHERN ARCHITECTURAL ASSOCIATION.—Outdoor Meeting at Hexham.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Council Meeting at 1.30 p.m. General Meeting at 2 p.m.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Visit to Kew Gardens at 3 p.m.

Monday, June 10.

CLERKS OF WORKS ASSOCIATION.—Meeting at Carpenters' Hall at 7.30 p.m.

Wednesday, June 12.

INSTITUTE OF SANITARY ENGINEERS.—Meeting at New Offices, 19, Bloomsbury Square, W.C., of General Purposes and Finance Committee at 4 p.m., and Half-Yearly General Meeting at 7 p.m.

Thursday, June 13.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Dr. Phené, V.P., F.S.A., on "Our Highly Refined Forefathers in Pre-Roman Britain."

Friday, June 14.

INSTITUTION OF ELECTRICAL ENGINEERS.—Conversazione at Natural History Museum, Cornwall Road, S.W., 9 to 12. p.m.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
June 7	Leicester—Stabling, &c.	Midland Railway	Company's Architect, Cavendish House, Derby.
„ 7	Whamtown, near Carlisle—Farmhouse	D. Johnstone	71 Broad Street, Carlisle.
„ 7	Leeds—Excavation	School of Art	Bedford & Kitson, Greek Street Chambers, Leeds.
„ 7	Jagger Green, Stainland—Farmhouse	—	F. F. Beaumont, Southgate Chambers, Halifax.
„ 8	Uxbridge, Middlesex—Electricity Generating Station	Electric Supply Co., Ltd.	W. A. Bird, 1 Vine Street, Uxbridge.
„ 8	Camborne, Cornwall—Reseating, &c.	—	G. Tonkin, Barripper, Camborne.
„ 8	Llandaff—Alterations, &c., to Police Station	Glamorgan County Council	T. M. Franklen, Clerk, County Council Offices, Westgate St., Cardiff.
„ 8	Melksham, Wilts—Stabling, Coach House	Frome United Breweries Co., Ltd.	W. G. Brown, Architect, Park Road, Frome.
„ 8	Henfield—Police Station	West Sussex County Council	W. B. Purser, 4 Worthing Road, Horsham.
„ 9	Tylorstown, Wales—Houses	—	Duke of York Hotel, Tylorstown.
„ 10	Blackburn—Wing	Guardians	F. O. Ruddle, Union Offices, Cardwell Place, Blackburn.
„ 10	Blaenycwm, Wales—School	Ystradyfodwg School Board	J. Rees, Hillside Cottage, Pentre.
„ 10	Resolven, Wales—Alterations, &c.	—	J. Ll. Smith & Davies, Architects, Aberdare.
„ 10	Helmsley, near Alnwick—Alterations, &c.	J. R. Carr-Ellison, J.P.	M. T. Wilson, Architect and Surveyor, Alnwick.
„ 10	Bristol—Shed Superstructure	Docks Committee	W. W. Squire, Engineer, Cumberland Basin, Bristol.
„ 10	Manchester—Blue Bricks	Corporation	Secretary, Rivers Department, Town Hall, Manchester.
„ 11	Barking, Essex—Lodge, &c.	Urban District Council	C. F. Dawson, Public Offices, Barking.
„ 11	Carlisle—Buildings, &c.	Corporation	Gas Offices, Victoria Viaduct, Carlisle.
„ 11	Denbigh—School Buildings	County School for Boys	A. Foulkes-Roberts, Clerk, Local Governing Body, Denbigh.
„ 11	Holyhead—Chapel	Committee of Ebenezer Chapel	Chapel Vestry, Kingsland, Holyhead.
„ 11	Oldham—Wall, &c.	Electricity Committee	A. Andrew, Gas and Water Offices, Greaves Street, Oldham.
„ 11	Stretford, Manchester—Brick Gas Holder Tank	Gas Company	H. Kendrick, Engineer, Stretford, Manchester.
„ 11	Usk, Mon—Cottage	Great Western Railway Company	Engineer, Newport Station.
„ 11	West Ham—Three Transformer Chambers	County Borough	Borough Engineer Office, Town Hall, West Ham, E.
„ 11	Port Glasgow—Slaughterhouse, Offices, Fire Statn., &c.	Town Council	Stewart, Tough & Alexander, 2 Hamilton Street, Greenock.
„ 12	Draycott, near Derby—Isolation Hospital	Shardlow Isolation Hospital Committee	F. S. Antliff, Architect, Draycott.
„ 12	Leeds—Extending Fence	Corporation	City Engineer, Municipal Buildings, Leeds.
„ 12	Gt. Darland, Rochester—Cottage Homes and Schools	Guardians of Medway Union	G. E. Bond, Pier Chambers, Chatham.
„ 12	Bradford—Blocks, &c.	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford.
„ 12	Chiswick—Double-Fronted House	—	F. & W. Stocker, 90–91 Queen Street, Cheapside, E.C.
„ 12	Greenwich—Urinal	Borough Council	Borough Engineer & Surveyor's Office, Town Hall, Greenwich.
„ 12	Killarney—Additions to Asylum	Committee of Management	J. F. Fuller, Brunswick Chambers, Dublin.
„ 12	Leytonstone, N.E.—Mortuary and Post-Mortem Room	West Ham Union Guardians	F. E. Hilleary, Clerk, Union Workhouse, Leytonstone, N.E.
„ 12	Grimsby—Court House, Police Station, &c.	Lindsey Standing Joint Committee	J. Thorp, 29 Broadgate, Lincoln.
„ 12	Hexworthy, Princetown—Enlarging Inn	Duchy of Cornwall	R. C. Merson, Architect, Hollybank, Yelverton.
„ 12	Beccles—Infants' School	School Board	A. Peels, Architect, London Road, Beccles.
„ 13	Southminster—Police Station	Essex County Council	F. Whitmore, Architect, Duke Street, Chelmsford.
„ 14	Exeter—Buildings	Town Council	D. Cameron, City Engineer and Surveyor, Exeter.
„ 14	Llanfihangel-y-Creuddyn—New Turret	School Board	Rev. J. P. Evans, Vicarage, Llanfihangel-y-Creuddyn.
„ 14	Tisbury—Wesleyan Chapel and Schools	—	E. Deweyn, High Street, Tisbury.
„ 15	Southall, Middlesex—Repairs, &c.	Burial Board	Superintendent's Lodge, Southall Green.
„ 15	Canterbury—Infants' School Buildings	Managers	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
„ 15	Christchurch—Nurses' Home at Workhouse	Union Guardians	A. Druitt, Clerk, Workhouse, Christchurch.
„ 15	Glasgow—New General Hospital	Parish Council	J. Thomson & R. D. Sandilands, 241 West George Street, Glasgow.
17	Wenlock—Reservoirs, Cottages, &c.	Madeley & Broseley Joint Water Committee	Municipal Offices, Ironbridge, Shropshire.
„ 17	Worksop—Infirmary Buildings	Guardians	H. C. Scaping, Court Chambers, Grimsby.
„ 18	Edmonton, N.—Chimney Shaft, &c.	Union Guardians	T. E. Knightley, 106 Cannon Street, E.C.
„ 18	London, E.C.—Alterations to Underground Convenics.	Corporation	Engineer to the Corporation, Guildhall, E.C.
„ 19	London, N.—Renovation of Methodist Chapel	—	W. Knight, 1 Langdon Road, Upper Holloway, N.
„ 19	Marsh Green, Dagenham—Mixed School	Dagenham School Board	Harrington & Ley, 65 Bishopsgate Street Without, E.C.
„ 21	Winchester—Alteratns. & Additns. to Public-houses, &c.	Messrs. Welsh & Co.	T. Stopher, 57 High Street, Winchester.
„ 25	Walthamstow—School Buildings	School Board	G. E. T. Laurence, 22 Buckingham Street, Adelphi, W.C.
	ENGINEERING:		
June 7	Farnworth, Lancs—Tramway Overhead Equipment	Urban District Council	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
„ 7	Rochdale—Tramcars	Corporation	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster, S.W.
„ 8	St. Petersburg—Embankment	—	St. Petersburg Town Council (Stadtamt).
„ 8	Rio de Janeiro—Electrical Machinery	Brazilian Government	Commercial Department, Foreign Office, S.W.
„ 8	Ipswich—Boilers, &c.	Corporation	W. Bantoft, Town Clerk, Town Hall, Ipswich.
„ 8	Batley—Temporary Wooden Bridge	Town Council	O. J. Kirby, Borough Engineer, Batley.
„ 10	Egremont, Cheshire, Widening, &c., Ferry Pier	Wallasey Urban District Council	Ferry Manager, Egremont Ferry, Cheshire.
„ 10	Rochford, Essex—Water Mains, &c.	Rural District Council	J. Mansergh, 5 Victoria Street, Westminster.
„ 10	Burnley—Injectors, &c.	Electricity Committee	R. Birkett, Borough Engineer, Aqueduct Street, Burnley.
„ 10	Leamington—Weir	Corporation	W. de Normanville, Town Hall, Leamington.
„ 10	Preston, Lancs—Fuel Economiser, &c.	Guardians	Whitwell, Engineer, Fulwood Workhouse, Preston.
„ 10	Glasgow—Electricity Meters	Corporation	W. A. Chamen, 75 Waterloo Street, Glasgow.
„ 10	Dartford, Kent—Laundry Machinery, &c.	Metropolitan Asylums Board	T. D. Mann, Clerk, Board's Offices, Embankment, E.C.
„ 10	Darenth, Dartford, Kent—Machinery, &c.	Asylums Board	Office of the Board, Embankment, E.C.
„ 10	Wakefield—Destructor, &c.	Corporation	City Electrical Engineer, Electricity Wks., Calder Vale, Wakefield
„ 10	Prestwich, Lancs—Ejectors	Urban District Council	Council Offices, Chester Bank, Prestwich.
„ 11	Sunderland—Pipe-laying	Water Company	Company's Offices, Sunderland.
„ 11	St. Germans, Hayle, and Briton Ferry—Footbridges	Great Western Railway Company	Engineer, Paddington Station, W.
„ 11	Tawnton—Plant	Corporation	Kincaid, Waller & Manville, 29 Gt. George Street, Manchester.
„ 11	Isleworth, W.—Gas Mains, Electric Light Wiring, &c.	Brentford Union Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
„ 11	Isleworth, W.—Hot Water Supply, Range, &c.	Brentford Union Guardians	W. Stevens, Clerk, Union Offices, Isleworth, W.
„ 11	Yeardsley-cum-Whaley—Reservoir, &c.	Urban District Council	Sterling & Swann, Town Hall, Chapel en-le-Frith.
„ 12	Edinburgh—Electric Lighting Installation, &c.	Lord Provost, Magistrates and Council	Resident Engineer, Electricity Supply Station, Dewar Pl., Edinburgh
„ 12	London, E.C.—Cranes, &c.	East Indian Railway Co.	C. W. Young, Secretary, Nicholas Lane, E.C.
„ 12	London, W.—Cranes	Central Electric Supply Co., Ltd.	General Manager of Co., 19 Carnaby Street, Golden Square, W.
„ 13	Warrington—Boiler, &c.	Corporation	Preece & Cardew, 13 Queen Anne's Gate, Westminster.
„ 13	Kearsley—Tramways Construction	Urban District Council	H. Nuttall, 20 Market Street, Bury.
„ 13	Exeter—Electrical Plant, &c.	City Council	H. D. Munro, City Electrical Engineer, Exeter.
„ 14	Stafford—Permanent Way of Sidings	Siemens Brothers & Co., Ltd	Siemens Brothers & Co., Ltd., Woolwich, Kent.
„ 15	Newcastle-upon-Tyne, Dredges, &c.	Tyne Improvement Commissioners	R. Urwin, Secretary, Bewick Street, Newcastle-upon-Tyne.
„ 15	Buckingham—Engines, &c.	Urban District Council	J. Smith, Engineer & Surveyor to the Council, Buckingham.
„ 15	Edinburgh—Ash-Conveying Plant	Magistrates and Council	Resident Engineer, Dewar Place, Edinburgh.
„ 18	London, S.W.—Steam, &c., Piping	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„ 18	York—Widening Bridge	North Eastern Railway Company	W. J. Cudworth, Company's Engineer, York.
„ 24	Copenhagen—Steam Ferry	—	Statsbanernes, Söfartsafdeling, Reventlowsgad, 16 Copenhagen B.
„ 25	Cairo—Engines, &c.	—	Inspector-General of Irrigation, Upper Egypt, Cairo.
Aug. 1	Manila—Harbour	—	Commercial Department, Foreign Office, Manila.
Dec. 10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL:		
June 11	Yeardsley-cum-Whaley—Cast Iron Pipes	Urban District Council	Sterling & Swann, Town Hall, Chapel-en-le-Frith.
" 11	London, S.W.—Rails, &c.	Queensland Railways	Queensland Government Office, 1 Victoria Street, S.W.
" 11	London, W.—Girders, &c.	Great Western Railway Company	Engineer, Paddington Station. W.
" 12	Bradford—Cast Iron Gullies, Grates, &c.	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford.
" 12	Dewsbury—Pipes	Waterworks Board	H. Dearden, Engineer, Town Hall, Dewsbury.
" 14	Preston—Pipes	Corporation	T. Cookson, Town Hall, Preston.
" 18	Leeds—Entrances to Park	Corporation	City Engineer's Office, Municipal Buildings, Leeds.
July 1	Calcutta—Bins	Corporation	Chairman of Corporation, Calcutta.
" 31	Sydney, N.S.W.—Rails		Agent-General for N.S.W., 9 Victoria Street, Westminster, S.W.
	PAINTING AND PLUMBING:		
June 7	Derby and Bugsworth—Painting	Midland Railway Company	Company's Architect, Cavendish House, Derby.
" 7	Romiley and Hayfield—Painting	Mid and Railway Company	Company's Architect, Cavendish House, Derby.
" 10	Aberdeen—Limewashing	Town Council	Sanitary Inspector, City Buildings, Aberdeen.
" 11	London, N.—Painting	Islington Borough Council	Borough Electrical Engineer, 50 Eden Grove, Holloway, N.
" 11	Medomsley—Painting, &c.	School Board	Clerk's Office, Shotley Bridge.
" 11	Plymouth—Painting and Glazing at Workhouse	Guardians	The Master, Workhouse, Plymouth.
" 18	London, W.—Painting at Infirmary	Paddington Guardians	E. H. Sim, 8 Craig's Court, Charing Cross, W.C.
" 18	Preston—Painting, &c., Cattle Market	Corporation	Borough Surveyor, Town Hall, Preston.
" 18	London, S.W.—Painting, Varnishing, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
Aug. 5	Cleckheaton—Interior Renovation of Church		Wesleyan Church, Whitcliffe Road, Cleckheaton.
	ROADS AND CARTAGE:		
June 10	Crewe—Street Works	Town Council	G. E. Shore, Borough Surveyor, Earle Street, Crewe.
" 10	Rochford—Widening Road	Rural District Council	F. Whitmore, Surveyor, Chelmsford.
" 10	Haverhill, Suffolk—Granite	Urban District Council	F. W. Knewstubb, Surveyor, Haverhill.
" 10	Leadgate, Durham—Limestone	Urban District Council	J. H. Coupland, Clerk, Shotley Bridge.
" 10	London, N.—Road and Sewer Work	Urban District Council	E. J. Lovegrove, Engineer to Council, Southwold Lane, Highgate, N.
" 10	Redhill—Materials	Reigate Town Council	Borough Surveyor's Office, Market Hall, Redhill.
" 10	Manchester—Stonebreaker and Engine	Corporation	Secretary, River Department, Town Hall, Manchester.
" 11	London, N.—Tar and Asphalt Paving	Tottenham Urban District Council	W. H. Prescott, 712 High Road, Tottenham, N.
" 12	Bury—Granite Setts	Tramway's Committee	A. W. Bradley, Borough Engineer, Bury.
" 13	Castleford, York—Improvement Works	Urban District Council	W. Green, Surveyor, Castleford.
" 14	Hull—Granite Setts	Corporation	A. E. White, City Engineer, Town Hall, Hull.
" 16	Wimbledon—Dust Vans	Urban District Council	C. H. Cooper, Surveyor, The Broadway, Wimbledon.
" 19	Wimbledon—Making up	Urban District Council	Council Offices, The Broadway, Wimbledon.
" 26	Dartford, Kent—Paving, &c.	Urban District Council	W. Harston, Surveyor, High Street, Dartford.
	SANITARY:		
June 8	Dartmouth—Sewer, &c.	Council	A. Smith, Borough Surveyor, Victoria Road, Dartmouth.
" 8	Hounslow—Sewer	Urban District Council	P. C. Parkman, Engineer & Surveyor, Town Hall, Hounslow.
" 10	Sunbury-on-Thames—Sewer	Urban District Council	C. E. Goddard, Clerk, Council Offices, Sunbury-on-Thames.
" 10	Clayton-le-Moors, Lancs—Materials	Joint Sewerage Board	Brierley & Holt, 20 Richmond Terrace, Blackburn.
" 11	West Ham—Conveniences	Town Council	Borough Engineer, Town Hall, West Ham, E.
" 11	Hertford—Sewers, &c.	Corporation	J. H. Jevons, Borough Engineer, Hertford.
" 13	Hurst, Lancs—Converting Closets	Urban District Council	Inspector of Nuisances, Council Offices, King Street, Hurst.
" 25	Strathaven, Scotland—Sewage Works	District Committee	W. L. Douglass, 3 Clydesdale Street, Hamilton.
	TIMBER:		
June 8	Windsor—Firewood	Guardians	Master of the Workhouse, Old Windsor.
" 10	Cardiff—Pit wood	Nixon's Navigation Co.	Company's Offices, Bute Docks, Cardiff.
" 10	South Hetton, Durham—Colliery Timber	South Hetton Coal Co., Ltd.	J. R. Lambert, South Hetton, Sunderland.

COMPETITIONS OPEN.

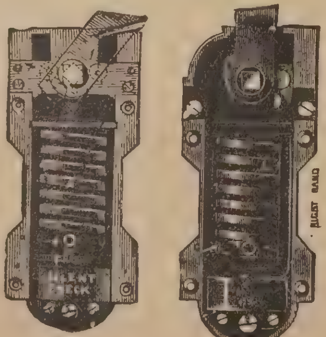
DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
June 10	Ennis, co. Clare—Additions, &c. to Lunatic Asylum	£50	J. Enright, Clerk of Ennis District Lunatic Asylum, co. Clare.
" 24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100	W. H. Talbot, Town Clerk, Town Hall, Manchester.
" 24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
" 30	Hereford—Municipal Buildings	£100, £75, £50	J. Carless, Offa Street, Hereford.
July 31	Manchester—Fire Station and Police Station	£300, £200 and £100	W. H. Talbot, Town Hall, Manchester.

ROBERT ADAMS, 65 & 67, NEWINGTON CAUSEWAY, LONDON, S.E.
THE BEST TESTED BUILDING SPECIALITIES.
DOOR SPRINGS, FANLIGHT OPENERS, GEARING, WEATHER BARS, PANIC EGRESS BOLTS, METAL CASEMENTS AND SASHES, REVERSIBLE WINDOW FITTINGS, ETC. *60 Highest Awards in Competition.*

The "Victor" Double Action Spring Hinges. THE BEST.

The Best Overhead Pneumatic Silent Check Door Spring, the "Empress Victor."

Greatest Variety of Fanlight Openers and Gearing in the World.



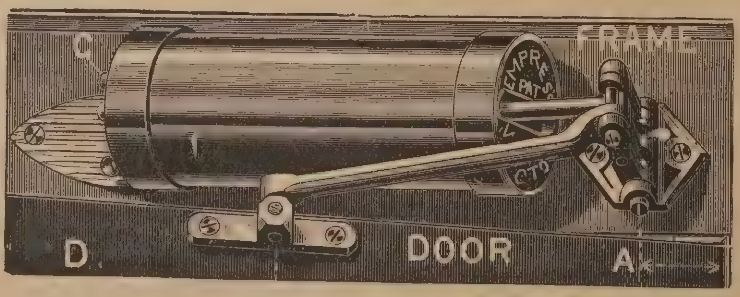
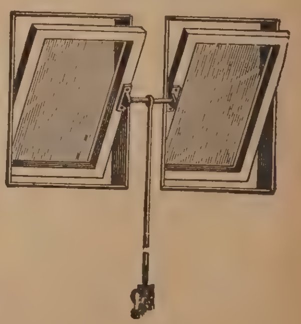


Fig. 1, as fixed on face of door.



CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	7	6		—	
Clover, best	per load	4	5	0	5	2	6
Hay, best	do.	4	7	0	4	15	0
Sainfoin mixture ..	do.	3	15	0	4	12	6
Straw	do.	1	8	0	1	16	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.	1	8	7	1	9	2
Colza Oil, English ..	do.	1	10	0		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	3	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels ..	do.	1	13	9	1	14	0
Petroleum, American ..	per gal.	0	0	6¼	0	0	6⅜
Do. Russian ..	do.	0	0	5⅛	0	0	5¼
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	2	18	6		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	4	6	1	5	3
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	1	7	0	1	7	3

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	85	0	0		—	
Iron, Staffs., bar ..	do.	6	0	0	8	10	0
Do. Galvanised Corrugated sheet ..	do.	11	5	0	11	10	0
Lead, pig, Spanish ..	per ton	12	6	3		—	
Do. do. English common brands	do.	12	17	6		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do. floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	0	0	6	5	0
Do. Mild Bars	do.	7	0	0	7	10	0
Tin, Foreign	do.	129	17	6	130	7	6
Do. English ingots ..	do.	133	0	0		—	
Zinc, sheets, Silesian ..	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	17	12	6	18	2	6

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel ..	per load	3	0	0	4	0	0
Pine, Quebec Yellow ..	do.	4	7	6	6	0	0
Pine, Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	0
Do. Petersburg ..	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P.Std.	9	5	0	12	10	0
Do. do. 4th & 3rd	do.	11	15	0	13	5	0
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	21	0	0		—	
Do. do. 2nd „	do.	19	0	0		—	
Do. do. unsorted	do.	12	15	0		—	
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	9	15	0	11	0	0
Do. White Sea ..	do.	9	15	0	13	0	0
Do. Quebec Pine, 1st ..	do.	22	0	0	23	0	0
Do. do. 2nd ..	do.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0		—	
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick ..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	6	5	0	10	0	0
Flooring Boards, 1in. prepared, 1st ..	per square	0	13	3		—	
Do. 2nd ..	do.	0	9	6		—	
Do. 3rd &c. ..	do.	0	8	6		—	

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6

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LONDON SHOW ROOMS:-
139&141 CANNON ST. E.C.
CATALOGUES FREE.

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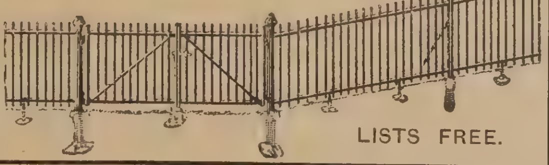

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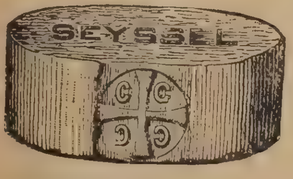

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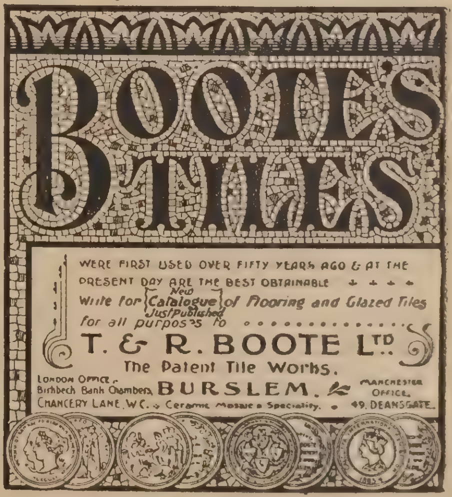

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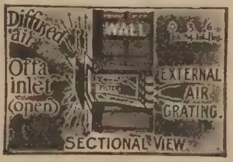

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		£	s.	d.	£	s.	d.
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba ..	per ft. sup.	0	0	4		—	
Do. Honduras ..	do.	0	0	$3\frac{25}{32}$		—	
Do. Tobasco	do.	0	0	$3\frac{1}{4}$		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras..	per ft. sup.	0	0	$4\frac{21}{32}$		—	
Do. African ..	do.	0	0	$2\frac{29}{32}$		—	
Do. St. Domingo	do.	0	0	$6\frac{3}{8}$		—	
Do. Tobasco ..	do.	0	0	$3\frac{3}{16}$	0	3	$4\frac{21}{32}$
Do. Cuba ..	do.	0	0	$4\frac{29}{32}$	0	0	$3\frac{13}{16}$
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks..	do.	6	0	0	17	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American ..	per cub. ft.	0	3	1		—	

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

CLAY CROSS (DERBYSHIRE).—For the erection of mission hall, for the Methodist New Connexion. Mr. Ernest Oxley, M.S.A., F.R.M.S., architect, Clay Cross:—

	£	s.	d.
R. Peck, Chesterfield	600	0	0
W. Forrest, Chesterfield	593	16	6
G. Hoyes, Nottingham	557	9	0
F. Lee, Alfreton	549	10	0
J. Madin, New Tupton	542	16	4
E. Tinkler,* Clay Cross	516	7	0

* Accepted.

COLEORTON.—For the erection of a new Primitive Methodist Church at Coleorton, near Ashby-de-la-Zouch. Mr. F. S. Antliff, architect, Draycott, near Derby. Quantities by architect:—

	£	s.
Moss	1,350	10
Orton & Son	1,325	0
Orton	1,289	0
Faulkes,* Loughborough	1,250	0

* Accepted.

DISS (NORFOLK).—For the erection of two villas and six cottages on Victoria Road, for Mr. J. C. Keen. Mr Henry Geo. Bishop, architect, Cheapside, Stowmarket, Suffolk:—

E. Smith	£3,740
E. Death	3,575
W. A. Wright,* Diss	3,366

* Accepted.

DUBLIN.—For rebuilding Methodist church, Abbey Street, Dublin, Mr. Geo. F. Beckett, architect, 97 Stephen's Green, Dublin:—

J. Farquharson, Jones's Road	£6,000
J. Pemberton & Son, Claremont Street	5,725
G. Langley, Ringsend Road	5,460
J. Beckett, Ringsend Road	5,400
J. Pemberton, Ranelagh Road	5,078
W. Beckett, Percy Place	4,870
J. & P. Good, Limited, Great Brunswick Street	4,700
J. & R. Thompson, Thompson Place, Belfast*	4,499
J. Lowry & Son, Chancery Street	4,475

* Accepted subject to approval of scheme by superior committee. Rest of Dublin.

LICHFIELD.—For the erection of school, house, &c., Borrowcop Hill, for the Grammar School Governors. Mr. T. Hillier-Pyke, architect, 61 Prestbury Road, East Ham, Essex:—

Warren	£9,484
Treasure & Son	8,393
Gethin	8,011
Nicholas	8,007
Marshall	7,923
H. Gibbs	7,730
Dones	7,686
James	£7,668
Sturgess	7,630
Warbenton	7,517
Lowe & Son	7,501
Gowing & Ingram	7,438
Ward & Son, Stone Road, Uttoxeter*	7,082

* Accepted subject to approval of the Charity Commissioners and modification.

LONDON.—For halls and other improvements at Wood's Road School, Peckham, for the London School Board. Mr. T. J. Bailey, architect:—

J. Marsland & Sons	£15,278
T. L. Green	14,993
Kirk & Randall	14,639
E. Lawrance & Sons	14,036
F. & H. F. Higgs	13,762
J. & C. Bowyer	13,727
Holliday & Greenwood, Ld.	£13,596
W. Johnson & Co., Ld.	13,499
W. Downs	13,120
W. Smith & Son	13,015
Stimpson & Co.*	12,600

* Recommended for acceptance.

LONDON.—For new drawing class-room, modelling-room, &c. at Lavender Hill School, for the London School Board. Mr. T. J. Bailey, architect:—

F. & H. F. Higgs	£1,697
W. Johnson & Co.	1,608
W. Downs	1,602
J. Garrett & Son	1,578
E. P. Bulled & Co.	1,567
J. & M. Patrick	1,558
Holloway Bros.	1,557
Lathey Bros.	£1,557
Holliday & Greenwood, Ld.	1,524
W. H. Lorden & Son	1,477
J. & C. Bowyer	1,329
E. Triggs	1,322
J. Appleby	1,278
W. Smith & Son*	1,270

* Recommended for acceptance.

LONDON.—For the erection of new school, Bostall Lane site, Plumstead, for the London School Board. Mr. T. J. Bailey, architect:—

		A.
J. & M. Patrick	£30,435	£211
W. Johnson & Co., Ld.	30,278	208
F. Gough & Co.	29,688	287
Lathey Bros.	29,575	342
G. Munday & Sons	29,118	265
J. Smith & Sons, Ld.	29,104	181
J. Garrett & Son	28,861	330
J. Grover & Son	28,853	230
Kirk & Randall	28,817	304
E. Lawrance & Sons	28,171	212
Treasure & Son	27,770	83
W. Downs*	27,481	217

A. Add if walls of class-rooms and halls be plastered.

* Recommended for acceptance.

LONDON.—For the erection of pupil-teachers' school, Hildrop Road site, Camden Road, for the London School Board. Mr. T. J. Bailey, architect:—

Kilby & Gayford	£23,255
J. Allen & Sons	22,975
L. H. & R. Roberts	22,866
Leslie & Co., Ld.	22,863
J. & M. Patrick	22,732
C. Wall	22,545
G. S. S. Williams & Son	22,515
C. Cox	£22,512
Spencer, Santo, & Co.	22,498
E. Lawrance & Sons	22,142
T. L. Green	21,987
F. Gough & Co.	21,874
Treasure & Son	21,730
W. Gregar & Son*	20,933

* Recommended for acceptance.

LONDON, N.E.—For building new stores and stables at Kieselquhr Wharf, Homerton, N.E., for Messrs. A. Haacke & Co. Mr. C. Collas Robin, architect, 203 Strand, W.C.:—

	£	s.
W. H. Lascelle	2,347	0
Barrett & Power	2,215	0
R. E. Worsley	2,130	0
C. F. Thompson	2,100	10
Bull & Esdaile	2,100	0
Anley & Sons	2,090	0
W. Shurmur	2,088	0

LONDON.—For the erection of special school, &c. at Berger Road School, Homerton, for the London School Board. Mr. T. J. Bailey, architect:—

J. Grover & Son	£6,102
Killby & Gayford	6,096
W. M. Dabbs	6,090
G. Munday & Sons	5,849
Leslie & Co., Ld.	5,836
L. H. & R. Roberts	5,735
C. Wall	5,707
W. Shurmur	£5,661
W. Downs	5,656
C. Cox	5,655
E. Lawrence & Sons	5,598
Treasure & Son	5,216
T. L. Green	5,187
J. Chessum & Sons*	4,915

* Recommended for acceptance.

LONDON.—For the erection of school, West Hill site, Wandsworth, for the London School Board. Mr. T. J. Bailey, architect:—

W. Downs	£34,825
C. Wall	34,710
Holloway Bros.	34,450
W. Johnson & Co., Ld.	34,171
E. Parsons & Co.	33,707
E. Lawrence & Sons	32,265
W. H. Lorden & Son	£31,888
Spencer, Santo, & Co., Ld.	31,063
Stimpson & Co.	30,430
J. & M. Patrick	30,009
Martin, Wells & Co.	29,555
W. Smith & Son	29,497

* Recommended for acceptance.

LONDON, S.E.—For the erection of new school, Wickham Lane site, Plumstead, for the London School Board. Mr. T. J. Bailey, architect:—

J. & M. Patrick	£23,431
J. Garrett & Son	22,334
W. Downs	22,296
J. Chessum & Sons	22,283
F. & H. F. Higgs	21,971
E. Lawrence & Sons	£21,788
Perry & Co.	21,695
Treasure & Son	21,234
Kirk & Randall*	20,440

* Reocmmended for acceptance

LONDON, S.E.—For the erection of the Imperial Hall, Grove Vale, East Dulwich, S.E., for the Syndicate. Mr. J. W. Brooker, architect, 13 Railway Approach, London Bridge:—

H. J. Williams	£9,195
Edwards & Medway	9,179
Colls & Sons	9,140
G. J. Kick	8,887
Bywaters	8,856
W. Downs	£8,743
Parker	8,725
Marks	8,307
Kent	8,131
F. H. Hopkins*	7,881

* Accepted.

MIDLETON (IRELAND).—For the erection of a range of 16 cottages and other works in connection therewith, for the Midleton Urban District Council. Mr. Richard Evans, C.E. architect, 53 South Mall, Cork—

Kearns, Cork	£2,846
J. J. Caffey,* Midleton, co. Cork	2,733

* Accepted.

PENDLETON (LANCS.).—For the erection of a Primitive Methodist school in Enys Street, Whit Lane, Pendleton. Messrs. Moulds & Porritt, architects, 77 King Street, Manchester:—

Ramsbottom, Pendleton	£2,354
W. Southern & Sons, Salford	2,227
J. Gerrard & Sons, Swinton	2,075
Carlyle, Old Trafford	1,991
Bridge, Higher Broughton	1,979
Burgess & Galt, Ardwick	1,975
Byrom,* Bury	1,972

* Accepted.

STONEHOUSE.—For additions, &c. to Stone Hall, Stonehouse, for Mr. J. Lockie. Mr. Edgar M. Leest, architect, Public Hall Chambers, Devonport:—

	£	s.
Taylor & Son, Stonehouse	595	0
Thos. Crews ,,	496	0
Smith & Son, Devonport	489	15
W. J. Oliver* ,,	420	0

* Accepted.

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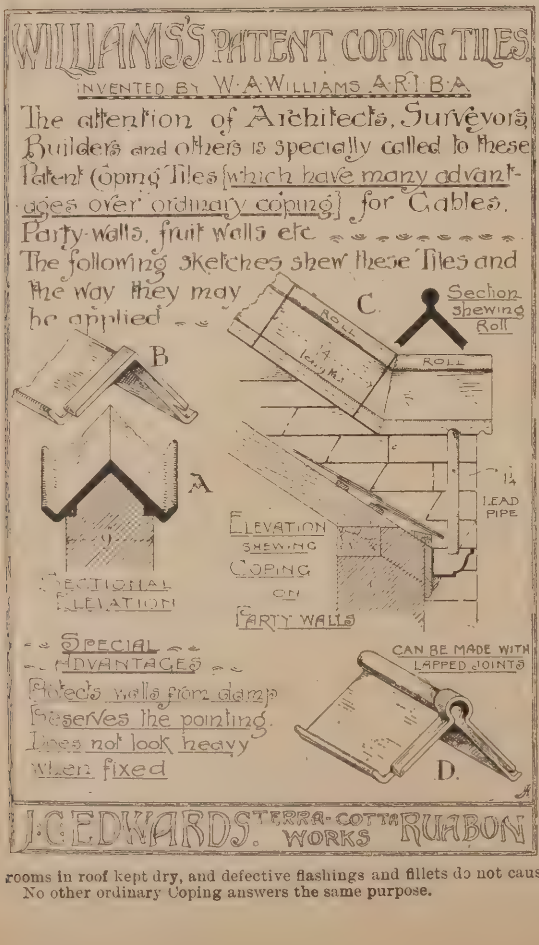
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C.
Section shewing Roll
ROLL
ROLL
A
1¼ LEAD PIPE
SECTIONAL ELEVATION
ELEVATION SHEWING COPING ON PARTY WALLS
SPECIAL ADVANTAGES
Protects walls from damp
Preserves the pointing.
Does not look heavy when fixed
CAN BE MADE WITH LAPPED JOINTS
D.
J·C·EDWARDS. TERRA-COTTA WORKS RUABON

This Coping prevents the water collected by it from running down and soaking into the wall beneath.

The end tile is provided with outlets, from which the water can be conducted to the eaves gutter or elsewhere by a small lead pipe, or the outlet holes can be omitted, the tile throated and set to let the water shoot clear of the building, but the pipe is recommended and the expense is trifling.

It can be used as well on the flat, as raking, for with a little care it can always be laid to a slight fall, the outlets then should not be more than 10 feet apart.

The Tiles are set and jointed in cement, the edges being scratched up rough to form a key, making a permanent and water-tight joint.

It will be seen that with these Copings the walls are protected from dampness, pointing preserved, rooms in roof kept dry, and defective flashings and fillets do not cause so much leakage. No other ordinary Coping answers the same purpose.

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THE BUILDERS' JOURNAL
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JUNE 12, 1901.
No. CCCXXXI.

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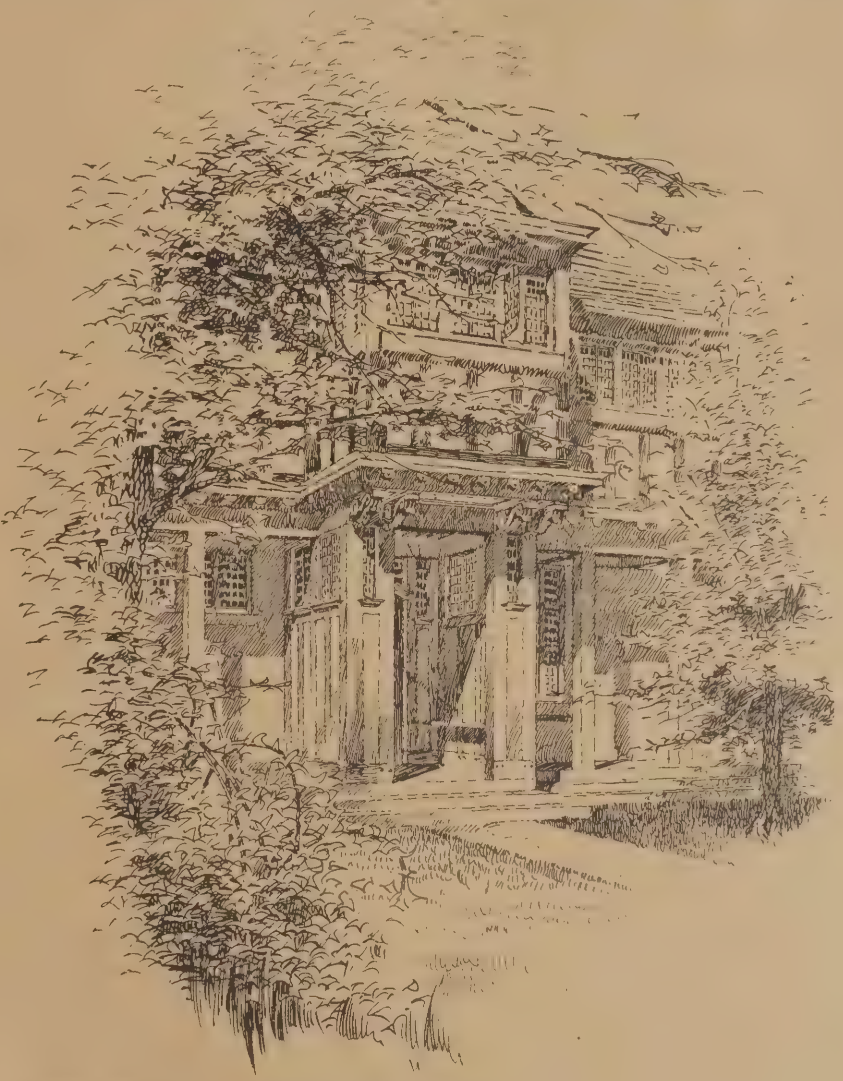
An Architectural Causerie.

The Architectural Money-Market. OWING to the anticipation of a heavy rise in materials, there was little demand for Newton country-houses at £3,000–£5,000, though the action of a certain section of the profession resulted in a momentary hardening in Baillie Scott - beam-and-post - ultra-mediævals, which speedily lapsed to their former position. In the face of cogent arguments to the contrary, Mountford town-halls were firm, several being disposed of at a 10 per cent. advance, but Pite memorial bridges were uninfluenced, though they showed signs of rising soon. Belchers exhibited considerable vitality and strength, and Mawsons rallied. Business in libraries was brisk, Mountfords again holding the market, but tending to become a little weaker with the heavy competition. A little excitement took place in railway stations, where Ricardo no-style-all-styles led the way, but, as was expected, this was only temporary. Bateman & Batemans were down ¼, and Brewill & Bailys looked like taking a similar turn, when Niven & Wigglesworth-plenty-of-bay-windows-and-leaded-lights came rapidly forward, keeping the market from shrinking, though not before Bedford & Kitsons had started on the downward movement. Matcham theatres showed little signs of improvement, being comparatively stagnant. The tendency of the new-all-new school was the reverse of cheerful, owing to the lack of cohesion; Wilsons, however, looked up a little, and there was a fairly brisk demand for Prior colleges. At £2,500, *f.o.b.*, Voyseys were easy, though not quite so easy as generally supposed. A moderate enquiry was experienced for Bodley churches, with or without towers, Oldrid Scotts also commanding a ready sale, especially those fitted with the new buttresses. The tone of the Government market was good. Aston Webb museums rose a little, but there was not much movement in new War Offices: Sir John Taylors were steady—very steady. Emerson commercial buildings remained unchanged, but the finest Macartneys were eagerly sought after. Collegiate-Champneys were quiet. Owing to the disappearance of fears of a corner in L.C.Cs. the demand for Holborn-to-the-Strands was strong, Runtz theatres and restaurants being especially brisk. No Norman Shaws were offered, and no official reports were forthcoming, though much in request. Session houses were settled. Architecture manufacturers reported a good volume of work for early execution, and buyers sent in specifications more freely. Home demands were satisfactory and prices were firmer, with an upward tendency in some branches. A confident tone prevails consequent on enquiries for supplies during the summer. Towards the close the market was glutted with unsuccessful competition works, which were going at low figures, owing to the fall in merit. Quennells were restive, and speculatives gave way fractionally. Notwithstanding American advices, cribbing was constant. Public baths, since the reduction of rates, improved a point: Saxon Snells were steady. Memorials created a great flutter and fell heavy on the profession. Towards the end the market showed signs of flagging, especially among the eschew-all-tradition sections, and it is difficult to foresee what devolopments will take place: it is however fairly certain that jerrys and the surveying-and-designing-done-here combination will retain a firm hold.



DESIGN FOR A HALF-TIMBER PORCH. SIDNEY V. NORTH, A.R.I.B.A., Architect.

Half-Timber Porch. THE porch by Mr. Sidney V. North, A.R.I.B.A., illustrated on this page, is intended to be constructed of half-timber, Stockholm tarred, with rough-cast panels. In order to afford protection from the weather the projection is made deep, the front partly closed, and the opening further protected by a wide projecting top.

Architectural Dinners: A Hint. IF brevity be the soul of wit, long speeches are the soul of ennui. This fact has been strongly impressed on us lately by the annual dinners of two prominent architectural societies. On both occasions too many toasts were chosen, and too many speakers set down to propose and respond to them—a mistake which had the result of boring one to death after six or more of the speakers had stopped their flow of oratory. At the last of the two dinners to which we particularly refer no fewer than ten toasts appeared on the list, necessitating *twenty-two* speeches. It is apparent that such a list must become wearisome, and, as a proof of it, we may mention that at the dinner in question when some of the later speakers rose to their feet three-quarters of the company had left. We would therefore urgently advise those who are responsible for such functions to see that their labours are not spoiled by the exceeding great length of the toast list.

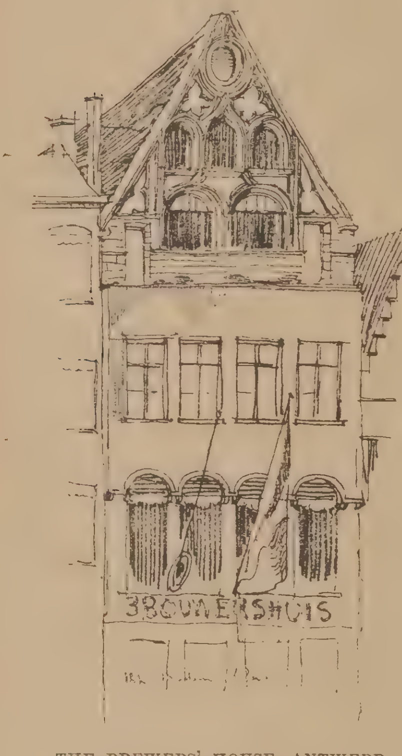
Berlin International Fire Exhibition. THE attention of the British Fire Prevention Committee having been called to the fact that the curious lack of enterprise on the part of the English fireproofing and fire-appliance trade had resulted in this country being scarcely represented at the Berlin International Fire Exhibition, steps have been taken to see that Great Britain is at least represented by some scientific exhibits. A large stand has, in fact, now been retained by the Committee to show photographs, plans, &c., of such materials and systems of construction as have been before the Committee for investigation, and a number of models are also being sent to Berlin. Although the British Fire Prevention Committee has, from patriotic motives, tried to step into the breach at short notice with exhibits arranged from a scientific point of view, the lack of enterprise on the part of the trades concerned is highly regrettable. If individual firms do not see their way to participate in exhibitions, the petty jealousies and rivalries should at least be so far overcome as to allow of an economical "collective" exhibit, so that the credit of our industries is upheld and a loss of trade prestige avoided.

FLANDERS—COMMERCE AND ARCHITECTURE—II.

By JAMES LOCHHEAD, A.R.I.B.A.

(Concluded from p. 332 of No. CCCXXX.)

IN addition to the mere mass of detail in these Flemish buildings, and what might be termed mere prettiness, the *scale* appeals to the careful observer; and if, by virtue of no proper means of comparison, the notion of size of some of the buildings illustrated has not been adequately conveyed, it is impossible in the majority to ignore the fact that *good proportion* is one of their characteristics, the scale being, as a rule, well adjusted to the site, size and object of the buildings. One can learn in a very emphatic way the extent to which sizes of materials assist this element, because of the smallness of the stones and bricks, which increase the apparent size of the building. In some cases the stones do not run thicker than 5in. or 6in. even in many of the great buildings, while 2in. is quite a common thickness in brickwork.



THE BREWERS' HOUSE, ANTWERP.

Especially at Oudenarde Hotel de Ville I consider this element of scale beautifully applied, and from a combination of this with another inherent virtue, that of grouping, this building, in common with others, derives a value which is worth analysing.

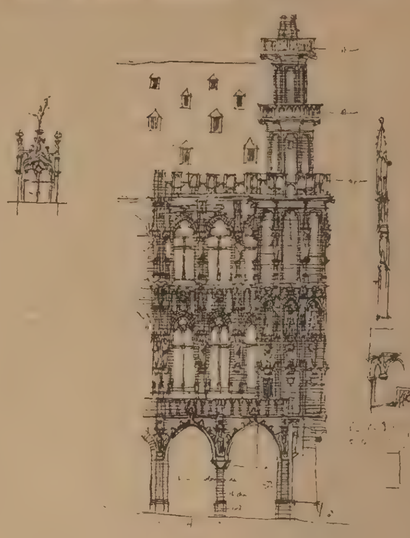
Grouping, either applied to the component parts of or to the building itself in combination with others, is attained by masterly expedients; and although in the later examples much breadth has been sacrificed in too ambitious efforts after picturesque effect, for the most part the mass of these edifices attained by good scale and judicious grouping is admirable. Some time ago an American journal had a series of articles upon the massing of buildings on which effects were sought to be gained by certain arbitrary rules, but it seems to me that no formula other than that of a mind well trained in the art of proportion, grouping and scale, is necessary for this result. The magnificent mass of the Cloth Hall at Ypres is attained, not by an agglomeration of restless features, but by the admirable scale and breadth. This breadth is assisted, too, by the great roof surface, and in these Flemish buildings the treatment and importance given to the roof forms one of the outstanding features of the age. "I view, then," says Sir Gilbert Scott, "the high roof as partly the result of climate, and partly of the æsthetic tendency of the style." Some of the examples have indicated the peculiarity in the direction of dormer windows, which rise tier upon tier from the wallhead to near the ridge, without disturbing the general breadth, and expressing the sense of economy of space to which, in a public building especially, the roof could be put. And not only the roof, welded to the architectural virtue alluded to, but its outward expression in the gable, forms one of the salient features and contributes to the general picturesqueness of the country. In this latter quality the Flemings were masters; and for varied treatment, diversity and elegance of forms, and juxtaposition, forming attractive groups, whether erected in wood, stone or brick, these features of Flemish architecture are probably unique, and in themselves an instructive and pleasant study, their charms heightened by their situation by deserted canals and arising in unexpected and accidental perspective. But the regular disposition of façades and the prominence given to the more important buildings, by their being erected as component parts of a Public Square or Grand Place, a feature of every Flemish city and expressive of its national life, show that mere picturesqueness was not always aimed at when more dignity was desirable. The constant recurrence of the square, with its civic and important buildings grouped together, induces comparison and hopes that some of our own cities, though burdened with the ubiquitous obstacle to architectural grandeur, cost of land, made more of this institution, by the use of which architecture and the sister arts can exist together, nature and art side by side, the whole forming an embodiment of art and civic life.

Decoration in these buildings—I refer to that externally, though perhaps not always refined, sometimes redundant, and often reminiscent of Ruskin's dictum that "ornament cannot be overcharged if it is good, and is always overcharged if it is bad"—has at least a moral good, because at all times it is earnest and spontaneous, an expression of the workman's joy in his work, and a testimony to Matthew Arnold's discernment that—

> "What poets feel not, when they make
> A pleasure in creating,
> The world in its turn will not take
> Pleasure in contemplating."

And on this account we can probably pardon the bad statuary and sometimes meaningless ornament.

One other distinctive feature which impresses one is the open spire, and which, applied to civic as well as ecclesiastic buildings, seems peculiarly appropriate, centralising, dominating and dignifying the structure, its open and diversified character—especially that at Brussels—being in complete harmony with the nature of the facade itself, which would, I think, have resented anything with less sympathy. There are occasions when a tower with unbroken wall-space is wanted to act as a foil to a facade, but in the nature of things in this and other instances, more affinity seems desirable, and anything else with less treatment might have appeared to separate instead of binding the buildings together.



HOTEL DE VILLE, BRUSSELS.

It is perhaps a matter for regret that some of this labour was not extended to the beautifying of the interiors, which for the most part, not even excluding some of the churches, are lamentably barren and quite justify Grant Allen's advice in many cases "not to go inside." In this respect the civic buildings exhibit in too marked a degree the purpose, for no doubt the severity was born of a desire to add no feature which was not compatible with a purely utilitarian object. If the reticence—if we may call it so—had been less thrust on one's notice, it might have been a virtue, but as it exists it is a too emphatic expression of purpose.

On the whole, it will be granted that these buildings do express their *raison d'être*, and that in a style of architecture which is often supposed to be inconsistent with secular use, and more properly applied to ecclesiastical creations.

This raises the question for us of expediency, and one pauses to reflect upon the comparative merits of Gothic and Classic without considering that in the present case there was no choice in the matter. One of the champions of mediæval architecture, Sir Gilbert Scott, expresses himself clearly on this subject in his lectures; and his

OLD HOUSES. ANTWERP.

views, taken and considered in opposition to those of as eminent a Classicist, the late Greek Thomson, provide an instructive and interesting mass of confounding opinion.

In a well-known lecture delivered by the latter to the old Glasgow Architectural Society in 1866, in which he holds forth on the unsuitableness of the style adopted by the former authority for the new University buildings, then in their inception, some of the most able arguments which could only have emanated from such an enthusiast are adduced, which in the present case form very apt reading.

Certain of his theoretical objections apply certainly to the nature of the buildings themselves, as applied to a seat of learning, which in our case do not apply, but his arguments where tenable and applicable to any Gothic building, especially unecclesiastic, while revolving round the archæological and traditional ideas that the style is not national, that the Christianity it represents was not of the purest type, that it is founded on erroneous principles of construction, the product of uneducated men, that it does not teach us the higher ideals of architectural art, and is inconsistent with the best examples of sculpture and painting, are all broadly summed up in the belief that it is not compatible with the expression of the regular and evenly-balanced repose necessary in a public building. To quote his own words in reference to this particular instance, "The general scheme and aspect is Classic, while the minor features are Gothic and somewhat confused."

CHURCH OF ST. PAUL, ANTWERP.

When doctors differ, who can agree; and when Sir Gilbert pleads on behalf of secular buildings that Gothic architecture, which, he says, "produced the stately municipal buildings of the great manufacturing cities of Mediæval Europe," has pre-eminent claims to our most loving and enthusiastic admiration, that it is capable of absolute freedom of planning and absolute subordination of external design to the practical requirements of the interior, that there was no love of irregularity for its own sake among mediæval builders, as shown, he says, by "the great market halls of Bruges and Ypres, the latter of which has a front 450ft. long, without one deviation from uniformity, simply because the practical requirements of each wing were identical"; that its external features, such as windows, for the first time in the history of architecture, could be made of a size which position and utility might dictate, wide or narrow, more or less numerous, arched or square-headed, and strictly according to the demands of the rooms. When pros and cons are expressed, each convincing in its way, one feels that it is imperative to view the question from a higher standpoint. And it seems to me that Sir Gilbert unconsciously solves the problem when he says that "honesty of treatment, that characteristic which all are agreed upon, does not belong exclusively to Gothic but to all true architecture. I feel that it matters not what style is adopted so long as this is kept in view, and that one style is suitable for any building just as the caprice, intelligence and earnestness of the individual dictates, leavened by what Mr. Lethaby calls "the critical use of past tradition."

In Flanders we see the fulfilment of this, in the spectacle of men working under a condition which necessitated application and earnestness—the condition of isolation. Notwithstanding the intercommunication with other nations, it was only to a limited extent that foreign influence was manifested upon its architecture, because there was little or no knowledge of past styles, of Greek or Roman, such as could be disseminated by the means of printing and illustration, consequently they went on working at things in their own groove, having no temptation to do otherwise, but at the same time betraying, if unconsciously, to succeeding generations those hidden symbols of their inspiration, begot of circumstance and desire, which one may discern beneath the outer and tangible remains of their handiwork.

ANTWERP CATHEDRAL.

We see the expression of liberty and freedom in the very nature and extent of their buildings, the spontaneous expression of the delight in life, untrammelled by considerations architectural or for the time politic, working as they thought best themselves.

We see the expression of respect for posterity, "of raising cities for future nations to inhabit," of building for all time, and realising that their edifices were to benefit not only those who were with them, but those who came after them.

We see the expression of historical purpose in their monumental character, for, as Ruskin says, "it is in becoming memorial or monumental that a true perfection is attained," and history is so indelibly written upon the face of these buildings that it gives them a kind of immortality.

We see the expression of contentment, that they built well in the desire to remain in their natural sphere, to invest with the dignity of contented manhood the small habitation as well as the large, and enjoy the contemplation of the work of their own hands.

We see that architecture is, in its higher sense, the outward expression of the condition and character of the nation which produces it; and, to go further, as Walter Crane moralises, the expression of "the language of life, the richer, the fuller, the life, the more harmonious will be the forms of its outcome in art."

We discern these various feelings and more in the contemplation of the works of a nation who built in one style, whose interests were net unduly divided, whose love of country was pure, and whose freedom and honour were valued.

When these ceased to be, the art degenerated, or at least became less national, and the Flemish decline, produced by the cause which gave it birth—commercialism—is governed by the same law; "for when a great state," says Bacon, "grows to an over power, it is like a great flood that will be sure to overflow, for commonly such states are grown rich in the time of their degenerating."

"Commerce is able to work veritable miracles," says another, "bringing into contact the extremes of civilisation, enlarging and disseminating ideas, and helping forward towards that universal brotherhood of man, that universal peace and goodwill which is and must be the highest ideal of humanity."

The commercial maxims of the Hansa towns, however, were always narrow and selfish; monopoly was their watchword, their grand aim; and it was largely in consequence of this narrow policy, hastened by the declining commercial conveniences, that their ruin overtook them. "They perished," Helen Zimmern tells us in her history of the Hansa towns, "of that disease whereof corporations are apt to perish, namely, *egotism*, the centrifugal force which is perpetually tending to rend asunder all human society, and must inevitably do so when not restrained by some powerful antagonistic action."

When this decline set in, a wider art change, as we remarked, had also made its appearance: the Renaissance had come; and between the two causes the architectural monuments of Flanders ceased to be.

Art does not run in nations so much as in individuals, and it expresses itself in direct relation to the communities' desire for it. So that, being a matter of supply and demand, when the desire for art gives place to more sordid interests, the supply ends, and, what is more, under a wider architectural influence the nature of it changes because opportunity for free choice presents itself. "The moment free choice comes in," says Mr. Statham, "among a civilised and educated people who know all the architecture of the world, personal taste comes in, architecture becomes a personal art, and the idea of having a spontaneously practised national style always the same, and recognisable everywhere, is for us a mere chimæra."

That this cause and effect can be applied to Flemish architecture cannot be doubted, and it was the change in the nation's prosperity succeeding its high attainments in this direction which affected the desire for emulation in this personal art, which otherwise, and under favourable conditions, might have still produced good architecture. For a time the aftermath was rich and plentiful, as we have seen from the earlier Renaissance buildings, some of which exhibit that feeling for proportion, dignity and grace which characterises the best period, but at length the decaying influence could no longer be resisted, and the average present day architecture, with happily some exceptions, drags one with it to that depth of monotony from which the student is alone rescued by the elevating and inspiring evidences of what may be produced under a favourable combination of two ofttimes diametrically opposed elements—commerce and architecture.

MAISON DU ROI, BRUSSELS.

THE PLANNING OF HOSPITALS.*

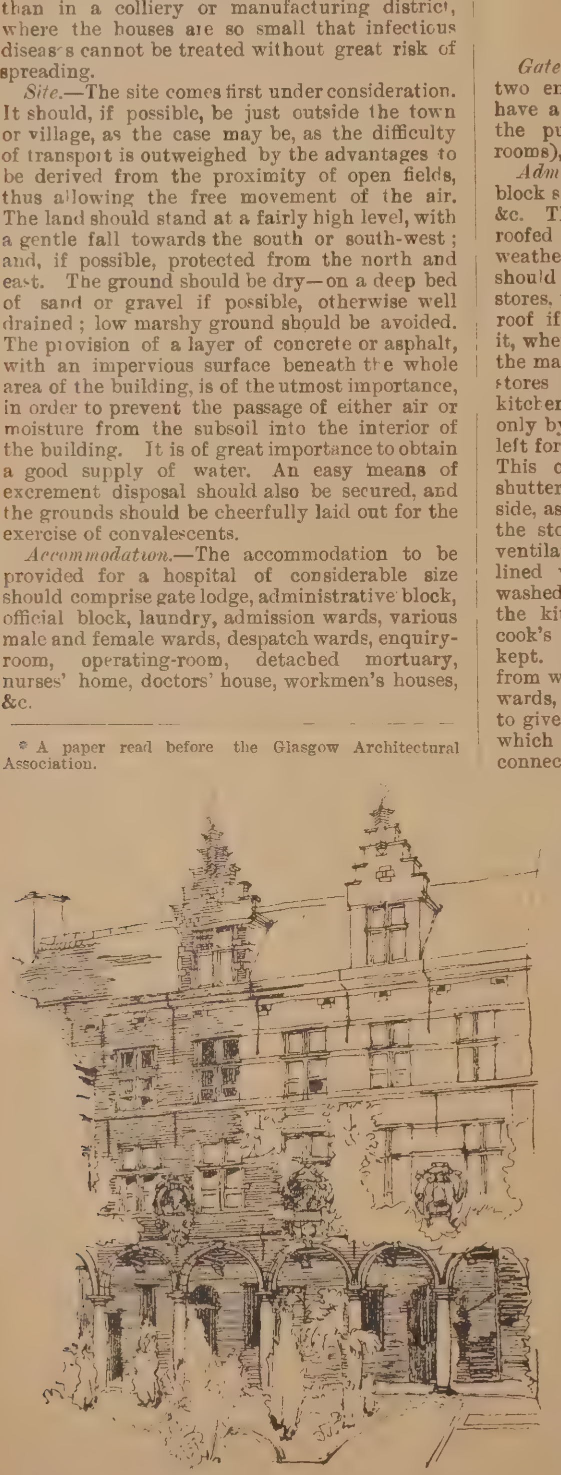
BY R. DOUGLAS SANDILANDS.

ALTHOUGH Acts have long ago been passed empowering local authorities to acquire land, and to provide and maintain hospitals for infectious diseases (the expense to be defrayed by a local rate), it is only of late years that the general public have realised the absolute necessity for such institutions; and owing to this fact little progress was made for a very considerable time after the passing of the Act. Now, however, county councils all over the country are doing their utmost to provide the various districts with buildings for the isolation of infectious diseases.

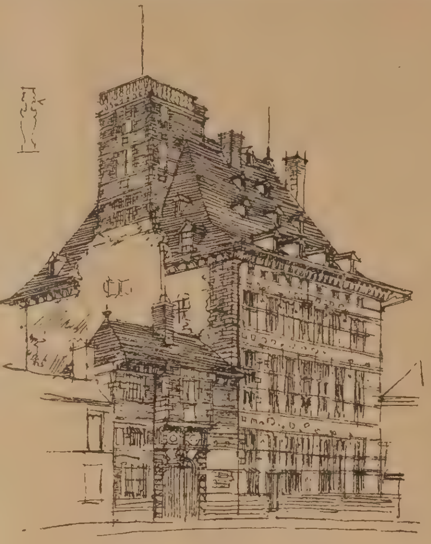
The size of infectious hospitals must be in proportion to the population which they are intended to serve. This, generally speaking, may be put at one bed per 1.000 inhabitants; but the requirements necessarily vary with the character of the population. Thus, in well-to-do localities the accommodation needed will be less than in a colliery or manufacturing district, where the houses are so small that infectious diseases cannot be treated without great risk of spreading.

Site.—The site comes first under consideration. It should, if possible, be just outside the town or village, as the case may be, as the difficulty of transport is outweighed by the advantages to be derived from the proximity of open fields, thus allowing the free movement of the air. The land should stand at a fairly high level, with a gentle fall towards the south or south-west; and, if possible, protected from the north and east. The ground should be dry—on a deep bed of sand or gravel if possible, otherwise well drained; low marshy ground should be avoided. The provision of a layer of concrete or asphalt, with an impervious surface beneath the whole area of the building, is of the utmost importance, in order to prevent the passage of either air or moisture from the subsoil into the interior of the building. It is of great importance to obtain a good supply of water. An easy means of excrement disposal should also be secured, and the grounds should be cheerfully laid out for the exercise of convalescents.

Accommodation.—The accommodation to be provided for a hospital of considerable size should comprise gate lodge, administrative block, official block, laundry, admission wards, various male and female wards, despatch wards, enquiry-room, operating-room, detached mortuary, nurses' home, doctors' house, workmen's houses, &c.



PLANTIN MUSEUM, ANTWERP: THE COURTYARD.



THE MONT PIÈTE, LIÈGE.

Gate Lodge.—The gate lodge should overlook two entrances, infected and non-infected, and have a good-sized office, with waiting-room for the public, also kitchen and scullery (two rooms), pantry, coal-house and w.c.

Administrative Block.—The administrative block should consist of general stores, kitchen, &c. The stores should have a goods entrance, roofed over to protect the goods from the weather while being unloaded. This entrance should open direct into the main hall of the stores, which should be lofty, lighted from the roof if possible, with a gallery running round it, where all light goods can be kept. Round the main hall there should be a number of small stores for oils, bread, beef, milk, &c. The kitchen should be separated from the stores only by a wall, in which an opening should be left for goods to be passed direct to the kitchen. This opening should have a door, or hung shutter, which can be locked from the stores side, as the storeman only should have access to the stores. The kitchen should be lofty, well ventilated, lighted from the roof, and the walls lined with tiles so that they may be easily washed down and kept clean. Entering from the kitchen there should be a scullery, also cook's storerooms, where cold meat, &c., can be kept. There should also be a despatch-room, from which all the food is sent to the various wards, &c. The kitchen should be so placed as to give easy access to the various wards, and to which it may, "if considered advisable," be connected by covered passages.

Official Block.—This block should be convenient to the entrance, and provide the following accommodation: Entrance hall, porter's room, office, waiting-room, matron's parlour and bedroom, doctors' business-room, board room, dispensary, medical laboratory, and the necessary accommodation for the medical staff.

Laundry.—The laundry should be divided into two sections--patients', officers', and foul wash-house, each having receiving-room, wash-house, drying-room, ironing-room, and delivery-room. The drying should be done by means of heated air driven through the drying-room by a fan. There should also be a disinfector and store near the foul wash-house for patients' clothes. Here the clothes of patients who have just arrived may be disinfected and stored until the patient is leaving. The disinfector should be of sufficient size to receive a bed. It is also advantageous to have the steam boilers for heating purposes placed here, as, steam being required to drive the laundry machinery, it will allow all the stoking to be done from one point.

Admission Wards.—The admission wards should be two in number—one for scarlet fever and one for diphtheria and enteric fever. They should be placed convenient to the infected entrance, and as near as possible to --but not adjoining --the wards of their respective diseases. Each ward should contain a good-sized receiving-room and well-lighted examination-room, with a bathroom adjoining. Provision should also be made for the warming of blankets and gowns. The patient, after being bathed and examined, is taken to the ward, and clothes are disinfected, then washed, and placed in patients' clothes-store, which should be near the discharge-rooms.

Main Wards.—The first point to consider in dealing with the main wards is the number of beds which ought to be placed in each. In determining this it would be necessary to ascertain the number of patients a charge-nurse and her assistant are able to attend to efficiently, and to plan the ward for the maximum, as multiplying the wards means increasing the adjuncts and, therefore, the expense. Most authorities on this subject hold that the number of beds in a fever ward should be twenty, and in a diphtheria and enteric fevèr ward twelve, and I think we may accept this as a satisfactory basis to go upon. This being fixed, we will now consider the size of the ward. The cubic space per bed has been fixed for us by the Local Government Board at 2.000 feet, and for diphtheria this might, with advantage be increased. We then have three very important items to consider—the linear wall-space per bed, the floor-space per bed, and the height of ceiling. I would suggest that the minimum for these should be—linear wall-space, 12ft.; height of ceiling, 13 feet. If we take the minimum width of ward at 26ft., this will figure out at 156ft. of floor space and a cube space of 2,028ft. per bed. But for diphtheria and enteric wards the linear wall-space should be increased, although it will be unnecessary to add to the height of ceiling, as for all practical purposes a height of 12ft. would be quite sufficient. I put the height at 13ft. because, the wards usually being large, 13ft. gives a better proportion. It is a very important point that the wards should run north and south, or perhaps incline to north-east and south-west, and, if possible, with the distal end of the ward to the south. It is also very essential to have a window between each bed, and also between the last bed and the wall, so as to allow good cross ventilation; and this can easily be secured with a linear wall-space of 12ft. This segregation by cross-ventilation, with ample floor and cube space, is much better than segregation by walls and partitions. It is almost unnecessary to state that all vertical angles of the walls, the horizontal angles of the junction of floors and walls and of walls and ceilings, should be rounded, as well as all angles of door panels and of the windows; and in the finishing of the doors and windows rounded fillets only should be employed, no recessed mouldings being used anywhere. The ward adjuncts are a nurses' room, scullery, side-room, day-room, linen-room, w.c.'s, bathroom, and, if the ward is two storeys high, fire-escapes should be provided at the distal end of the ward, that is to say, at the opposite end from the staircase.

Nurses' Room.—The nurses' room should be so placed that by means of small windows the ward, the side-room and the day-room can be overlooked. It should also be fitted with a small kitchen range, a dresser and a cupboard.

Scullery.—The scullery should be as convenient as possible to the nurses' room, and should be provided with a hot plate, washing and rinsing sinks, and a plate rack.

Side-room.—There should be a side-room for each ward for special cases which require to be separated from the patients in the main ward. It should adjoin and be overlooked from the nurses' room. It should have cross-ventilation, a separate w.c., slop sink with hot and cold water, and a cross-ventilated passage similar to the large ward.

Day-room.—The day-room will be used by patients who are convalescent as a dining-room and sitting-room, and needs little description except that it must be convenient to the ward, cheerful and well lighted.

Linen-room.—The linen-room should be large or small according to the size of the ward it is intended to serve, and should be fitted with linen presses and shelves.

W.C.'s and Bathroom.--The w.c.'s and bathrooms are usually placed in small turrets at the distal end of the ward; the space between them is generally roofed to serve as a verandah for convalescents. These turrets should be separated from the wards by cross-ventilated passages. It might be convenient to place the w.c.'s and sinks in one turret, and the bath and wash-hand basins in the other. The w.c.'s and sinks might be of the bracket type, standing clear of the floor, while the doors and partitions should be 4in. above the floor. The walls should be lined with tiles to a height of 6ft., and the upper walls should be plastered with Keen's cement. The floors should be of terrazzo. The baths should be glazed fireclay, and standing 4in. clear of the floor on glazed fireclay feet. The wash-hand basins should be of the bracket type, with one or more at a lower level for children. Heated towel-rails should also be used. The walls should be finished as already described for w.c.'s turret. There should be a separate w.c. for the nurse; also a robing-room to enable the nurses to change their home dresses for those used in the ward, and *vice versa*. As to the floors, we are so much accustomed to wood that we have difficulty in getting away from it; but as it is so liable to shrink and leave open joints where dirt will at once accumulate, I have no hesitation in recommending terrazzo for all infectious-diseases hospitals. It is sometimes argued that it is cold, but in practice this is never complained of. Regarding the finishing of the walls, tiles or glazed bricks are recommended by some, but there are so many joints in this method that is does not seem to me to be satisfactory. There are a great many other systems, but, after considering all that have come under my notice, I have adopted Keen's cement. At the same time great care must be taken in laying it, as it is liable to crack in drying, so that it would be advisable to put on the finishing coat only when the ground is thoroughly dry, if time will permit. This I think will best fulfil the requirements of a ward interior, namely, that it should be impervious and easily cleaned.

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* A paper read before the Glasgow Architectural Association.

THE QUAY AND MONT PIÈTE, LIÈGE.

GUILD HOUSES, GRAND PLACE, BRUSSELS.

Despatch Ward.—This should be near the gate lodge, and should consist of an undressing room (where the patients remove the hospital clothes), from which there should be a door to the bathroom, where the patient will have a bath, and another door leading from the bathroom to the dressing-room. where he will receive his own clothes, which during his illness have been disinfected and kept in the patients' clothes-store.

Enquiry-room.—At Ruchill there is a very well arranged enquiry-room for patients' friends. It is not connected with any infectious buildings. There is a raised platform about 4ft. high round the sides, divided from the remainder of the room by a glazed screen having casement windows with numbers painted on them corresponding to the numbers of the wards in the hospital. The friends come at stated hours, and the nurse is sent for from the ward, and, from the raised platform and at a safe distance from the visitor, answers questions relative to the patient.

Operating-room. — The operating theatre should be placed in a central position, and convenient to all the wards, to which it should, if possible, be connected by a covered way, the patient to be first taken to the anæsthetic room, where chloroform will be administered. This should communicate direct with the operating-room, to which the patient will next be taken. This room should have a good north light, and be fitted with all the modern appliances, including wash-hand basins—the hot, cold and waste being worked by foot levers. There should also be a splint room and sterilising room; also a bedroom adjoining the operating-room, where the patient can be taken if too weak to be removed to the ward, or if likely to succumb after being operated on.

Mortuary.—The mortuary should be so placed that funerals can take place without coming into view of the patients, and should consist of mortuary, post-mortem room, "with north light," laboratory, pathological-research room, photographic room, dark-room and waiting-room for relations, from which, through a window, friends can see the body, which will be placed on a raised slate slab in a small room adjacent to the mortuary.

Nurses' Home.—The nurses' home should be placed in a position convenient to the wards, and facing south. In the home there should be a small kitchen, a dining-room, a recreation-room, sitting- and bedrooms for assistant matron and night superintendent; also a sufficient number of bed-sitting rooms and bedrooms. There should also be a large boxroom either in the basement or attic. The servants (male and female) may be accommodated here or in the administrative block. If at the home, they should be on the top floor with separate entrances (male and female), a staircase being provided at each entrance, and a dividing partition placed between the male and female sides of the building. A few large sick-rooms might also be provided for nurses.

Doctors' House.—The doctors' house should be a better-class villa, and therefore needs no description. It should be near the entrance, and, if possible, so placed that visitors can call without entering the grounds.

Workmen's Houses.—The workmen's houses should be of two kinds—one with two rooms and a kitchen, and the other with three rooms and a kitchen. They should be placed on the boundary of or outside the grounds, so that the children need not come in contact with the nurses or patients. It would be well also to provide stabling and coach-house, where an ambulance van or a brougham can be kept.

Drainage.—Every hospital, and more especially hospitals for infectious diseases, should have a most efficient system of drainage. Therefore, all drains should have the most perfect system of flushing and ventilation; and to prevent infection being communicated from the enteric wards to the others by means of the excreta, a disinfecting apparatus should be provided to separate and disinfect the soil drainage from the enteric fever wards before it connects with the remainder of the system. It is also of importance to separate the drainage of the laundry from the other drains wherever it can be managed, as there is always a large volume of hot water draining from the laundry, which tends to raise the temperature inside the drains. The above refers entirely to the drainage of a large hospital, but architects are often called upon to design small fever hospitals for rural districts where no proper system of drainage exists. In this case I would recommend the use of earth-closets, as they are not liable to get out of order; and although they necessitate some labour, this at the same time prevents any feeling that might arise in the minds of the inhabitants in the vicinity that infection may reach their houses through the sewers. Where earth-closets are used there should also be a cesspool in the grounds, but as far removed from the buildings as possible, to which all slops from the scullery, laundry, &c., will be drained. This should be built in open brickwork, and, if in a sandy soil, the most of the liquid will drain into the sand, necessitating only the removal of solids deposited. I might also mention here that where water has to be paid for by meter it would be an economy to catch the whole of the rain-water from the roofs, where the hospital is a large one, and drain it to a large underground tank, whence it can be pumped to a tank to serve for laundry and other purposes.

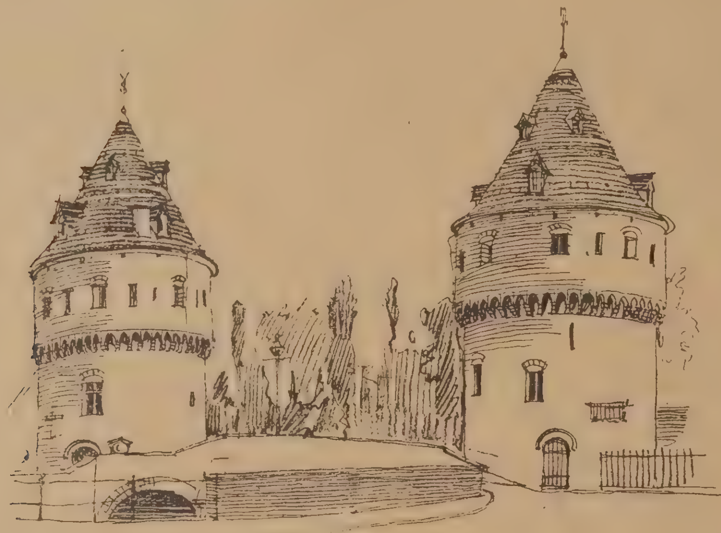
Lighting.—For the artificial lighting of hospitals I would recommend electric light wherever it can be used. as it is much more convenient in every way, and also much healthier for the patients than gas, which consumes the oxygen and gives off poisonous fumes. The lights should be so arranged that one switch would put on the necessary lights for the proper administration of wards by the nurses. Another would serve for movable lights to be placed at the head of every alternate bed for clinical purposes. Another switch would be used for turning on a few lights to allow the nurse to perform her duties during the night.

Heating and Ventilation.—The heating and ventilation of hospitals should be considered together, and the great importance of the free circulation of pure air throughout the wards must be borne in mind. The nurse should, in spite of the remonstrances of her patients, see that the temperature of the ward is kept between 60 degs. and 65 degs., and never allowed to exceed 70 degs., unless so instructed by the doctor. Should the hospital be in a town, I would recommend that the plenum system should be used; but as most hospitals for infectious diseases are built in the country the system most likely to be suitable would be low-pressure hot-water pipes going round the buildings in channels under the floors, which channels should be about 3ft. 6in. by 3ft., so that a man can go in to make repairs without lifting any of the floor. From these pipes, branches should be taken to radiators placed in window bossings, the water being heated by steam taken through pipes in subways from steam boilers at the laundry. The steam boilers should be placed at the lowest level, so that all condensed steam from the calorifiers will run back by gravitation to them, thus economising the whole of the water and a great part of the heat without the necessity of pumping. The whole of the water pipes, telephone wires, &c., should be carried in these subways and channels for convenience of repairs. Fresh air should be admitted through gratings in the walls, and passed through radiators to be partly heated before entering the ward. The foul air should be drawn off at the ceilings, whence it should be carried to the roof and extracted by means of air-pump ventilators. Two double stoves should be placed in a ward of twenty beds. These stoves should be of the Shoreland "Manchester" stove type. They have descending flues, and thus do not obstruct the nurses' view down the

CATHEDRAL. BRUSSELS.

ward. They are also of the ventilating type, fresh air being brought in from the exterior through glazed pipes, and passing behind and around the fire stove, thus being heated before entering the ward.

Consumptive Hospitals.—A special hospital which, in all probability, will demand a great deal of attention in the near future is the hospital for consumptive patients. Medical science of late years has made rapid strides in this direction, and we are much indebted to such men as Pasteur and Koch for the discoveries they have made, discoveries which have quite revolutionised the treatment of this disease. Formerly, consumptive patients were sent for treatment to mild sheltered districts, but now it is considered that only sites standing at a hhig altitude should be considered. After the site has been fixed, abundance of air and sunlight is imperative. The wards should be exceptionally well lighted and ventilated; and in laying out the grounds care should be taken to have plenty of open airing-grounds, where patients can sit out in the open air all day, and it would be well also to provide a number of kiosks with opening sides, of which two sides only can be closed at once. In these the patients can sit out all day, protected from the wind by the two sides which are closed. The floor of these kiosks should be at least 6in. above the ground, with free air-space underneath to prevent the damp rising.



BRIDGE TOWERS, COURTRAI.

I may say that in preparing this paper I have been indebted to a number of authors, and amongst others to an excellent paper read by Mr. T. N. Aldwinckle before the Royal Institute of British Architects on February 25th, 1895.

House at Streatham Park, S.W.—The house illustrated on the opposite page is now in course of erection in Aldrington Road, Streatham Park, S.W., from designs by Mr. William H. Burt, architect, of 10, Bush Lane, E.C. The facings are of red Crowborough bricks, and the roof is covered with Broseley tiles. Messrs. E. P. Bulled & Co., of Croydon, are the contractors.

A School for the Deaf.—The Yorkshire Institution for the Deaf, Doncaster, propose to erect new classrooms from plans prepared by Mr. J. Greenhalgh Walker, architect. Messrs. H. Arnold & Son's tender for £2,875 has been accepted. The building will consist of a central hall 59ft. long by 27ft. wide, with eleven classrooms grouped around and opening out of it. These rooms range in size from about 25ft. by 15ft. to 18ft. by 14ft., one of the larger being specially fitted up and lined with white glazed bricks for teaching cookery. All the rooms will have glazed brick dados, and will be heated by radiators. The front and side elevations will be of red bricks relieved by string courses, coping, &c., in Darley Dale stone. The whole of the floors will be formed with pitch-pine wood-blocks on cement concrete.

THE NATIONAL GALLERY.

AN AMERICAN EXPERT'S REPORT ON THE DANGER OF FIRE.

THE protection of the National Gallery against fire is a subject which is constantly attracting attention, by reason of the fact that its present condition, despite all assurances, is far from satisfactory. Mr. Spielmann, the well-known art critic, is the latest advocate for reform. Writing to the "Times," he says:—

A Bill, which it is hoped will be unopposed, is shortly to be presented to Parliament. But its provision is wholly inadequate, doing little more than to arrange for elbow-room for the firemen when the actual catastrophe occurs. This is something; but as to making the catastrophe impossible, that is altogether beyond the intention of the Government.

A few months ago I received a communication from Mr. Edward Atkinson, president of the Boston Manufacturers Mutual Fire Insurance Co. (U.S.A.), informing me that he had instructed his representative and fire expert, Mr. Sherman, to come to London from Liverpool in order to examine the actual situation and surroundings of the National Gallery, and to report to him. This report discloses very great and entirely remediable dangers. Mr. Atkinson, who holds an authoritative position as a fire expert, says:—

"1. In respect to the building itself. Windows guarded by iron shutters are not considered safe by us. The iron warps and twists at a moderate degree of heat, keeping the firemen out of the building and letting the fire in.

"2. A monitor roof with many windows like that upon the top of the old part of the Gallery is very hazardous, especially when dominated by a dangerous and combustible building higher than the Gallery itself. Shutters would serve but little to protect the windows in this monitor, even if they were of the latest and most improved type, namely, of wood faced on each side with Sackett Wall Board and then enclosed in metal; the Sacket Wall Board being one of the most perfect fire retardents yet invented, composed of alternate thicknesses of felt and magnesia plaster.

"3. The lead roofing of this building would not be tolerated longer than the time necessary to substitute a safe roofing, which on such a building ought to be of copper. In case this building should be dominated by a fire in the next block the lead would melt, endangering the roof beneath and preventing effective service of the firemen in their effort to get to the roof.

"But these dangers are aggravated by the bad neighbourhood. It may be assumed that the old infantry barracks will be removed. But the large building (Hampton's, &c.), occupied for various purposes in the distribution of very combustible goods, will be a menace to the National Gallery. Even if a passage way 40ft. wide should be cut through, that block will dominate the building, and in case of its being on fire the damage inside the Gallery may be very great. In a recent instance in the city of New York the burning of a building occupied in a similar way next to a high and so-called fireproof building greatly injured the walls, and, passing by unguarded windows, destroyed the contents of the upper storeys. There can be no permanent safety to the National Gallery unless that dangerous building is removed and the whole square (*i.e.*, plot of ground) devoted to the purpose of the Gallery, which it now so largely occupies."

ANNUAL MEETING OF THE SURVEYORS' INSTITUTION

THE annual general meeting of this institution was held on June 3rd at the premises in Great George Street, Westminster. Sir John F. Rolleston, M.P., the president-elect, occupied the chair in the absence, through illness, of Mr. John Shaw, the retiring president. The annual report, read by Mr. Rogers, the secretary, stated that the Institution now, probably, included in its list of members most of the surveyors of standing in the United Kingdom, and it had a total in the various classes of 3,200 compared with 3,096 a year ago. The total investments, calculated at current prices, represented a sum of £13,724 19s. Of 142 candidates who sat for the last preliminary examinations 111 passed, and of 362 who went up for the different professional examinations 246 passed. As was the case last year, professional examinations were held contemporaneously with the English examinations both in Scotland and in Dublin. The cost of the construction of the new premises was £30,337, to which had to be added architects' commission, law charges, &c., making a total of £34,198; while the outlay on new furniture and fittings amounted approximately to a sum of £1,000. The whole outlay had been met out of the accumulated funds. and no debt whatever remained upon the building. There had been large additions to the library during the year, and a further outlay would shortly be made on the purchase of books. The present number of volumes was approximately 8,000. During the session the council had promised financial support to, and had nominated two of their members to act on, a joint committee of the Surveyors' Institution and the Royal Institute of British Architects, appointed for the purpose of collecting and tabulating information from all parts of the country as to damage to buildings resulting from lightning; to discover, if possible, how far buildings were rendered lightning-proof by modern systems of protection; and to ascertain what improved methods might be adopted. The council also decided during the session to co-operate with the Royal Institute of British Architects on a joint committee with reference to the amendment of the law and practice as to ancient lights. The committee had since decided to draft a Bill for introduction into Parliament. Mr. E. H. Blake formally moved, and Mr. M. P. Holmes seconded, the adoption of the report, which was agreed to. The chairman, replying to a vote of thanks passed to the late president and members of the council, said the council was representative of the various branches of the profession. While regretting the retiring president's absence and its cause, he thanked them for the honour they had conferred upon him in electing him as his successor. He felt that to preside over an institution which was so important, popular and widely distributed as that, was an honour of which anyone might be proud. The chairman was then invested with the president's chain of office, and he afterwards presented the prizes gained during the past session In 1881 the candidates numbered two; now they totalled 362, the total number who have entered for the professional examinations since 1881 being 2,894. The principal award this year—the "Penfold" gold medal—went to William Edward Trent, who, in the building sub-division of Division IV., headed the list of Fellowship candidates with a total of 802 out of a possible 1,000 marks.

The "Institution" prize, worth fifteen guineas, went to M. P. Holmes, the "Special" prize to F. S. Daniell, the "Penfold" silver medal and "Driver" prize to D. L. Paton, the "Crawter" prize to H. A. C. Warmington, and the "Preliminary" prize to W. C. Clemens and A. Salwey bracketed equal.

DEVON AND EXETER ARCHITECTURAL SOCIETY.

PRESIDENT'S VALEDICTORY ADDRESS.

THE annual meeting of this society was held at Plymouth on June 1st, the president, Mr. C. J. Tait, occupying the chair. It was resolved that a subscription of three guineas and a donation of two guineas be made in response to the special appeal for the Architects' Benevolent Fund. In the course of his address as retiring president, Mr. Tait said that upon anything that occupied a position so near to us as the Victorian era it was impossible to utter the final note of criticism. This could only be accomplished when a sufficient period had elapsed. Four centuries ago saw a classic renaissance in art and letters, and we could to-day judge of its character and achievements. When we were enabled to view the Victorian age from a perspective point—its hopes and aims for art —we should agree that these also found expression in a re-birth,

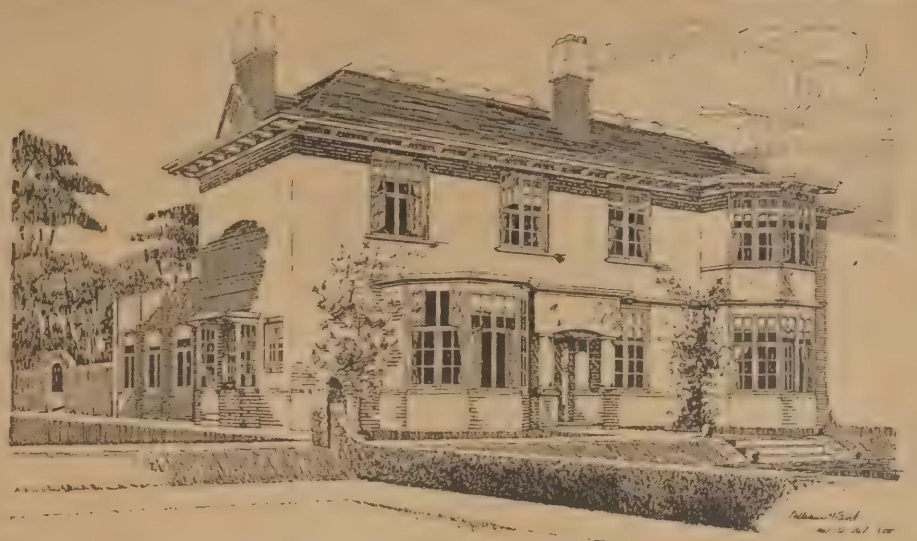
The Re-birth of Romanticism.

This romantic note was heard in its deepest tones, perhaps, at Oxford, and occasioned that upheaval of feeling that is spoken of as the Oxford movement. In so far as this was a church movement—and indirectly affected church architecture—it assisted to bring to the front such men as Augustus Welby Pugin, George Gilbert Scott and Edmund Street. But the springs of this movement lay deeper in art than perhaps in anything else, and found therein a more complete expression. Edward Burne-Jones and William Morris, both young Oxford undergraduates and destined for the Church, left the University without their degrees and devoted themselves—the one to painting and the other to architecture. And outside the walls of the University they met with a more paramount influence still—that of Dante Gabriel Rossetti—and the enthusiasms of young men like themselves. such as Madox Brown and Millais.

Through the painters, with places for exhibition at their disposal, the new movement gradually reached the public, which was finally convinced, much against its will, and not without a hard struggle. To William Morris, in particular, architects owed more than he could say. He (Morris) insisted on the importance of colour in architectural accessories; and his commercial undertakings slowly enabled him to force the fashion, that doorway by which alone society was accessible to new ideas.

Meanwhile Burges, Norman Shaw and E. W. Godwin were grafting a fresher growth on to architecture. But architecture transformed itself with difficulty. Styles had resistant materials to deal with. They were long growing, and they were "an unconscionable while a-dying." They further demanded specific needs for their true development; and these needs, while our social conditions were in that rapid fluctuation in which we find them to-day, were superseded before they had time to arrange themselves in definite form.

Further, this renaissance of the mediæval, of the romantic sentiment, revealed to us our true position—the position we held as inheritors of both classic and mediæval tradition. The claims of Gothic architecture were strong. Nothing could, however, be representative, nothing could be lasting, that did not give expression to all preceding influences—a something which combined the refinement of the classic with the freedom of the Gothic. Such a union was no fancy. Something of the kind was achieved by Tudor architecture; and he ventured to think that it was also by the combination of these qualities that the most striking successes in modern design had been realised. If this was a principle, as he held it was, then it behoved every architect to cultivate a catholicity of taste. His appreciative powers would be quickened, and he would find his life in all respects both fuller and broader. He might be told that specialism was more remunerative. To have your name intimately connected with some particular and limited want or department was the surest way to be recognised by a public who thought little, and whose memory was bad. But the age was not without signs that specialism and cranks in general had enjoyed their most profitable period, and that it was not so patient of the formalist and the pedant as it used to be.



HOUSE AT STREATHAM PARK, S.W. WILLIAM H. BURT, Architect.

Strand Improvement Competition.

Quitting the events of a century for those of a year, Mr. Tait spoke of the Strand improvement scheme, which resulted in a competition that called forth about half a dozen very interesting designs. It was to be noticed with regret that the London County Council sought to engage the services of the competitors upon most unreasonable terms, inasmuch as it would give no guarantee that the successful architect should execute his own design; and it was in every way so cavalier in its dealings with the Royal Institute, whom the Council had itself approached, that the Institute was obliged to decline further co-operation. Another fact to be noted was that the County Council had no clear intention as to what it actually required; and hoped, with Mr. Micawber, that amid the surprises of competition "something might turn up." To think that you needed to include a municipal building among shops and offices, but were not sure, could lead to no very definite competitive result.

The Queen Victoria Memorial.

Another competition, and one of national importance, had occupied the public interest — the proposed memorial to the late Queen. It appeared to be generally regretted that this endeavour was not put upon broader lines. The least defensible part of it was undoubtedly the placing whatever sculpture should be employed in the hands of a single sculptor. The only apology that might be made by the initiators of the scheme was that they considered sculpture of such minor importance as to render any multiplication of ideas unnecessary. This, he thought, would hardly recommend itself to those who realised the part played by sculpture during the best periods of monumental art.

Negotiations had for long been carried on between the Royal Institute and the Builders' Association with a view to a common understanding upon a form of contract acceptable to both architect and builder. His hearers were doubtless aware that these negotiations had been broken off with their object still unfulfilled. The cause of the failure was apparent. Unless the Builders' Association could obtain a form of contract that was distinctly favourable to it, its members knew that they were more safely situated in the hands of the architect directing the work, and preferred to leave matters as they were. The negotiations had, however, been successful in producing an exceedingly fair and thorough arbitration clause directing that the architect should be sole arbitrator, and one between which there was no half-way house.

After the president had concluded his address, the following elections were made for the ensuing year: President, Mr. H. G. Luff; vice-president, Mr. John M. Pinn; honorary secretary, Mr. Harbottle Reed; honorary treasurer, Mr. Octavius Ralling; members of the Council, Mr. Alton Bazeley, Mr. Charles Cole and Mr. C. E. Ware.

ROUND TOWER, ABERNETHY.

THE Edinburgh Architectural Association recently visited Balmanno Castle and the Round Tower, Abernethy. At the castle, built between 1577 and 1581 by George Auchinleck, of Balmanno, Mr. William M. Page acted as leader, and he read a paper comparing the plan to that of Balvaird, an adjoining castle. Balmanno is surrounded by a remarkable moat, and has a vaulted ground floor, large rooms on the first floor, and a private stair in the thickness of the wall. The Round Tower, Abernethy, was visited under the leadership of the Rev. Dugald Butler, M.A., minister of Abernethy. The tower is a memorial of the antiquity and early ecclesiastical importance of the place. The first church of Abernethy was probably the result of St. Ninian's preaching among the Southern Picts. Abernethy was at one time the capital of the southern Pictish kingdom, and is also described in the Scotichronium as the "capital of the whole kingdom of the Picts." The church was dedicated (according to the Pictish chronicle) in 460 A.D. to St. Bride of Kildare, and endowed with large territories by Nectard, King of the Picts. The church was restored by St. Columba in 590 A.D. For two centuries at least it was a Columban monastery, closely connected with Iona, and was a missionary centre of religious life to the country round. About 716 the king of the period conformed to Rome, and the Columban clergy were expelled, and conformists to Rome took their place. About 844 another revolution happened and the Columban clergy were restored. Abernethy once more assumed its ancient importance, and from about 850 to 908 A.D. became the metropolitan church of the whole kingdom of the Picts. Dr. Skine avers that the Round Tower, which could only have been the work of the Irish clergy restored by Kenneth MacAlpine, was erected at this time (between 865 and 908 A.D.), and this is all the more probable as it is undoubtedly of an older type than the Round Tower at Brechin, the date of the building of which can be placed with certainty late in the succeeding century. Its main work is Celtic, although the upper windows are additions, propably of the eleventh or twelfth century. The doorway contains no symbolism as at Brechin, and the door faces the north. The present wooden stair is a recent addition, and originally there were internal platforms. Like the other round towers, it served the purposes of (1) a bell-keep, (2) a signal tower or beacon, (3) a place of defence and preservation in time of attack by the pillaging Danes. For about twelve courses from the ground the stone is a hard grey sandstone; the rest of the structure is of a bright buff-coloured freestone, much weather-worn at the joints. The period of the Round Towers generally dates from the ninth to the eleventh century.

A New Infectious Diseases Hospital at Berwick is to be erected of stone, to contain sixteen beds, at an estimated cost of £5,500, exclusive of furnishing and site.

THE LATE MR. BRYDON'S WORK AT BATH.

AN APPRECIATION BY W. J. LOFTIE.

IN an article in the "Bath Chronicle," speaking of the late Mr. J. M. Brydon's work in Bath, Mr. W. J. Loftie says:—

It was not easy, as many had found to their cost, to take up the art of building where the Woods and Baldwin had laid it down. For some reason, with which I am not acquainted, the revived Gothic of Pugin and Scott never took root in Bath. The two principal buildings in that style, St. Michael's Church in Broad Street and the Roman Catholic Chapel in South Parade, are in very conspicuous situations and act satisfactorily as foils to the fine old tower of the Abbey in its well-proportioned dignity. But when Brydon went to the rescue, Bath was in danger of becoming a prey to what we in London know as the South Kensington style. In the Colonies they call it "the Exhibition Building" style; at Manchester it does duty as "Gothic" because there they point the arch. In Bath I think it was known as "Romanesque," and they did not point the arch. But it was everywhere the same, anomalous; and it would have been nothing less than a public misfortune—a misfortune that is not confined to Bath, but to be regretted by all England—if it had succeeded to any great extent in affecting the general view of your most beautiful city. From this danger Brydon saved Bath. We are all liable to what our religious teachers call "declension." The learned style implied both incessant care and incessant improvement. No other art can be overlooked or neglected by the architect; and if to his knowledge he can add a little classical learning so much the better for his designs. This implies taking pains, and no "declension" can be allowed. It is all, to use another comparison, "collar work." As distinguished from anomalous building or even the Gothic of Street and Burges, the Palladian architecture of Inigo and Wren, of Wood and Chambers, can never become common. Mr. Norman Shaw first expounded it to the architects of the nineteenth century, and of all those who have followed him John Brydon will always be reckoned the foremost.

It is sad to think how long he worked without recognition. He had attained a success in the estimation of many who were practical workers in the same field as far back as 1870. But there he remained. Younger men came to him for counsel and passed him in the race, and at forty-five the general public had heard little or nothing of him. An opportunity came when he made his exquisite designs for Whitefield's Chapel in Tottenham Court Road. Other counsels prevailed. After unaccountable delays, most wearing to a sensitive mind, the present pagoda was preferred and erected, and London lost the offer of a beautiful building. But his designs had been published, and all the more learned of the art critics knew that when a better opportunity arose the man to answer to it would not be wanting.

That chance came when you in Bath determined to improve your municipal buildings, by which I mean not your Guildhall alone, but the rooms adjoining your warm springs and the old Roman bath—the great glory of your ancient city. A similar chance occurred some time before to the people of another old Roman town, remarkably like Bath for beautiful architecture. If any of your citizens would see and judge for himself how well Bath fared in this respect at the hands of John Brydon, let him in his next Continental tour visit Nimes and see how the French architects have treated the ancient remains at La Fontaine. The problem was a difficult one. "Restoration," to use in its modern sense a word which has become odious, was not only impossible—that would have been a small matter with Sir Gilbert or Mr. Pearson—but unpopular. As solved by Mr. Brydon the difficulty has but increased the success. Nothing has been falsified. The learned visitor has before him suggestions and reminiscences of the usages described by the classical historians and at the same time can see how far they were carried out at Aquæ Solis. The unlearned visitor also finds himself interested and unexpectedly informed without too great a mental effort as to what is ancient and what has been added to set it off and preserve it.

Of the new concert-room it is difficult not to exaggerate my feelings of admiration and wonder. I do not think it over stating the case to say that since Sir Christopher Wren built St. Stephen's, Walbrook, no other interior worthy of comparison with it has been erected. Since I saw the concert-room last January I have urged many of my architectural friends to go to Bath. One and all have returned saying what I have just said, and generally adding, "Without an inch of ornament for its own sake."

The additions to the Guildhall are equally good. Fully to understand and sufficiently to appreciate them it is well to place before our eyes the photographs of what High Street was like before Mr. Brydon came and since. The gallery and library in Bridge Street depends solely, but certainly not in vain, on the delicate proportions; but it would be impossible in a short notice to point out that to Brydon a space of blank wall, carefully and laboriously calculated to a square inch of stone surface, was in itself more ornamental than all the panelling and lattice work on the river front of the Palace of Westminster. Westminster brings me to the last words I venture to offer you now. It should—and will, no doubt—always hereafter be a credit to the people of Bath that Brydon's work here obtained for him the great triumph of his life—the appointment to design the new Government offices. It is no secret that when his name was mentioned the powers that be took the sensible course of sending to see what he had done at Bath, and that it was in consequence of the report returned that he was appointed.

ARCHITECTURAL ASSOCIATION OF IRELAND.

A GENERAL MEETING of this Association was held at Dublin on May 30th, the president (Mr. Frederick Batchelor) occupying the chair. This meeting was the concluding one for the session 1900-1, and the reports of the various classes were read and the results of the several competitions announced.

The class of design was very satisfactorily attended during the session, and good work is recorded. The prizes in connection with this class were gained by Mr. W. Connolly (first prize) and Messrs. J. K. Vinycombe and H. J. Leask (tie for second prize). The hon. secretary of this class was Mr. G. G. Lynes. The architectural history class (Mr. R. M. Butler, hon. secretary) was also well attended, and proved a most useful innovation. In this class the progress and changes in architecture were traced by the lecturers and illustrated by lantern views of typical examples. In the building construction class the first prize was won by Mr. H. J. Lundy and the second by Mr. W. Connolly. Mr. W. H. Ward was secretary to this class. The report of the design club is not so encouraging, and it is hoped that in future better attendances will be maintained.

Probably the most satisfactory of all reports was that of the technical demonstrations subcommittee. The necessity for giving architectural students an opportunity of studying practical details and of discerning between good and bad materials and workmanship is one which had not been met hitherto, and early in the session steps were taken to inaugurate what proved to be a most successful series of practical demonstrations, for the arrangement of which the president and the hon. secretary of the sub-committee, Mr. H. Allberry, are largely responsible. The master-craftsmen of Dublin most readily and generously co-operated in the work, personally conducting the members of the Association over their yards and workshops, and explaining, lecturing and demonstrating upon the different materials and manners and methods of work. The value of these demonstrations was so very evident that many gentlemen became members of the Association in order to avail themselves of them. Prizes were offered for the best series of notes taken, and were awarded in order of merit to Messrs. L. O'Callaghan, H. T. O'Rorke and F. Morley. The members of the Association have reason to be particularly grateful to those contractors and master-craftsmen who so generously assisted in the work.

The librarian, Mr. J. Geoghegan, submitted a very satisfactory report. In addition to the very valuable library which Sir Thomas Drew has so kindly placed at the disposal of the members of the Association, a lending library has lately been started, the volumes in which have been presented by several gentlemen or purchased from a fund which has been opened for the purpose.

The A.A. Travelling Studentship of ten guineas was won by Mr. J. A. Rockett, whose measured drawings of St. Patrick's Cathedral were adjudged by Mr. A. E. Murray, A.R.H.A., as the best of those submitted in competition.

The Royal Institute of the Architects of Ireland offered a prize of £10 10s. for a design to be competed for by members of the Association. The subject set for design was "A Technical School," and seven members submitted drawings, under motto, which were kindly assessed by Mr. W. H. Lynn, R.H.A. (Belfast). Mr. W. Kaye Parry read the assessor's award, which placed first the design submitted under motto "Cui Bono," and upon the president openingthe envelope bearing that motto it was announced that the successful competitor was Mr. C. P. Powell.

Mr. W. F. Beckett's prize of £2 2s. for the best sketch of the campanile in Trinity College was won by Mr. L. O'Callaghan.

The result of the ballot for the officers for the ensuing session (1901-2) was announced as follows: President, Mr. C. J. McCarthy; vice-presidents, Messrs. T. E. Hudman and E. P. Sheridan; committee, Messrs. H. Allberry, F. Batchelor, R. M. Butler, T. Coleman, F. G. Hicks, J. Holloway, C. H. Mitchell, L. O'Callaghan and R. C. Orpen; hon. treasurer, Mr. J. H. Webb; hon. librarian, Mr. J. Geoghegan; hon. secretaries, Messrs. E. Bradbury and G. F. Beckett; hon. auditors, Messrs. M. J. Buckley & J. P. McGrath.

The retiring president (Mr. Frederick Batchelor) delivered a short valedictory address in which he reviewed the work of the Association during the past session and expressed hopes for the future. He referred to the series of day classes recently inaugurated by the London Architectural Association, and trusted that something of a similar nature, though on different lines, might be started in connection with their Association. Mr. Kaye Parry, in an able speech, proposed a hearty vote of thanks to the retiring president for his valuable services during his term of office, which was seconded by Mr. C. J. McCarthy and carried with applause. A vote of thanks to the retiring hon. secretary, Mr. F. G. Hicks, was proposed and seconded by Mr. H. Allberry and Mr. R. M. Butler respectively, who, as past secretaries, were able to appreciate the arduous nature of his duties. The vote was carried with acclamation, as was also one to Mr. J. H. Webb, hon. treasurer, proposed by Mr. T. E. Hudman and seconded by Mr. E. Bradbury. Mr. J. Rawson Carroll having congratulated the Association upon the work done during the past sessions, the meeting terminated.

Masters and Men.

A Strike of Crieff Masons has occurred because the masters proposed to reduce their wages from 8d. per hour to 7½d. with no change on country allowances.

Edinburgh Joiners' Dispute.—Mr. Charles Scott Dickson, K.C., M.P. (the Solicitor-General for Scotland), the arbitrator appointed under the reference between the Edinburgh and Leith Masters Builders' Association and the Edinburgh and Leith District Joiners' United Trades Committee. Upon the proposed reduction of the wages from 9d. to 8d. per hour; the words "Portobello excluded" to be deleted from the working rules; under rule 4 one hour's grinding time to be allowed to workmen for putting their tools in order instead of, as at present, two hours to workmen who had worked fifty-one hours; rule 6, which prohibited piece and task work, to be deleted; and the date of expiry of notice changed from the 15th April to the 6th June. Mr. Dickson found that the rules should stand as at present without change.

Tilbury Cottage Hospital has been enlarged by the addition of a new ward for eight additional beds, making sixteen altogether, at a cost of £2,000.

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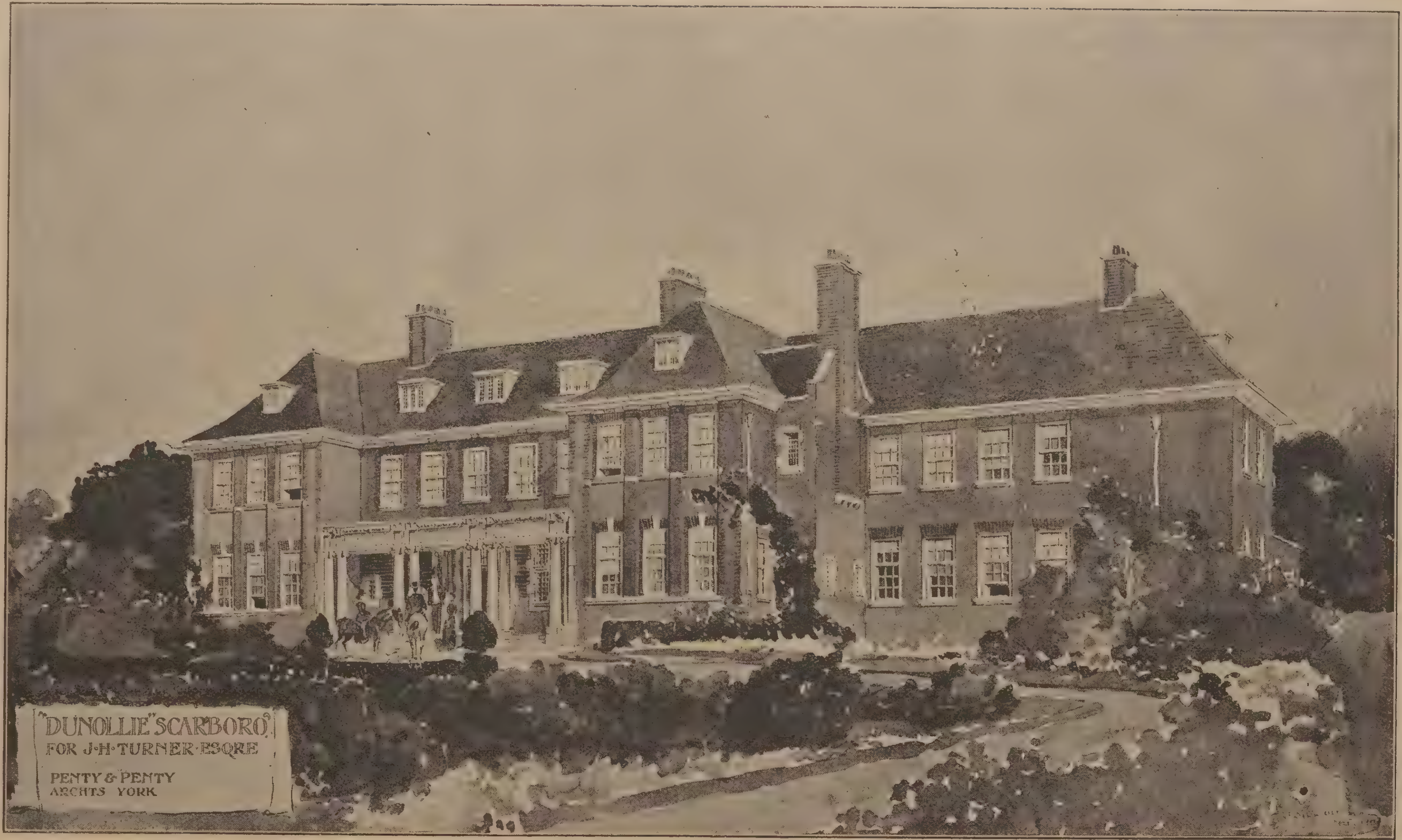

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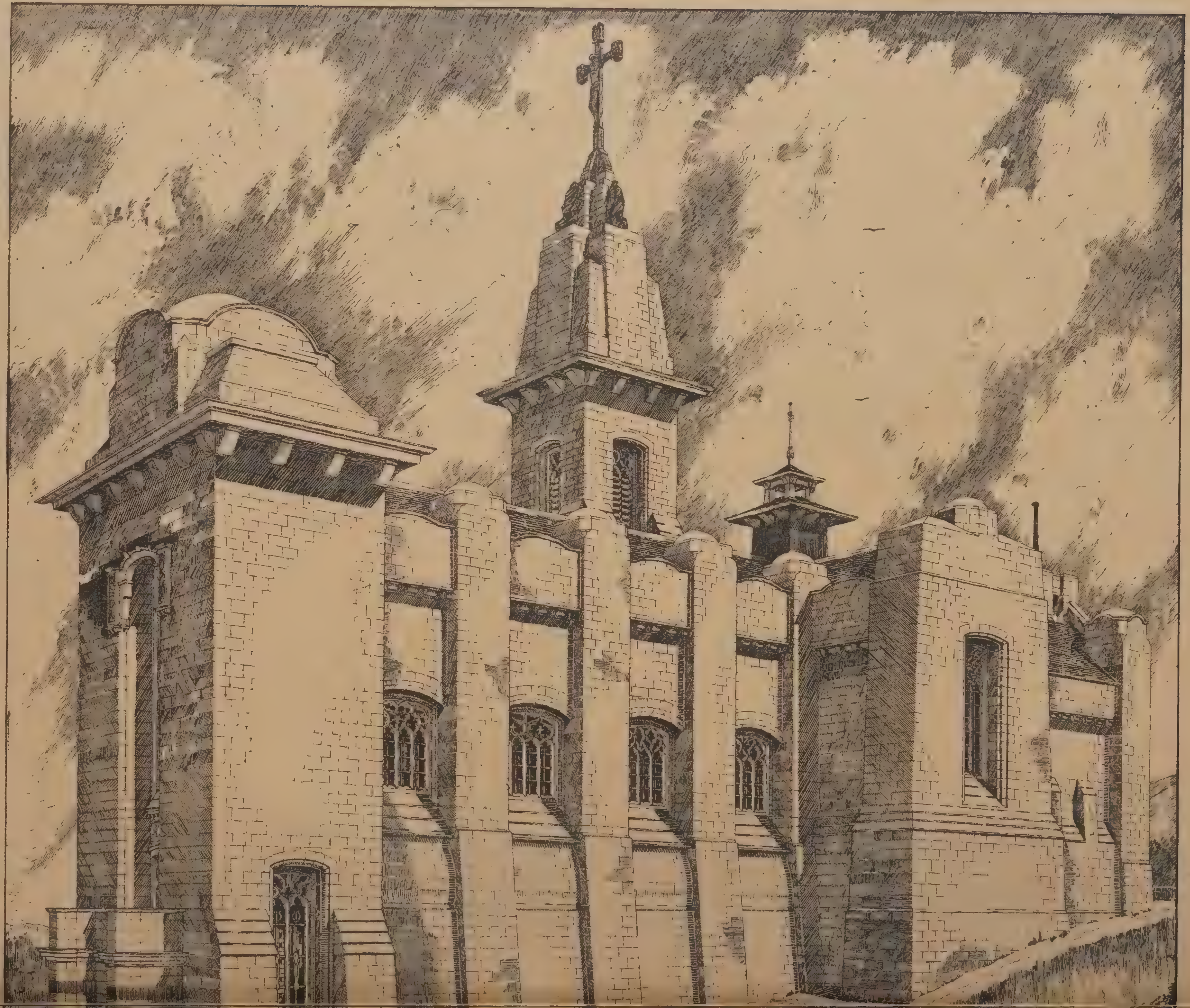

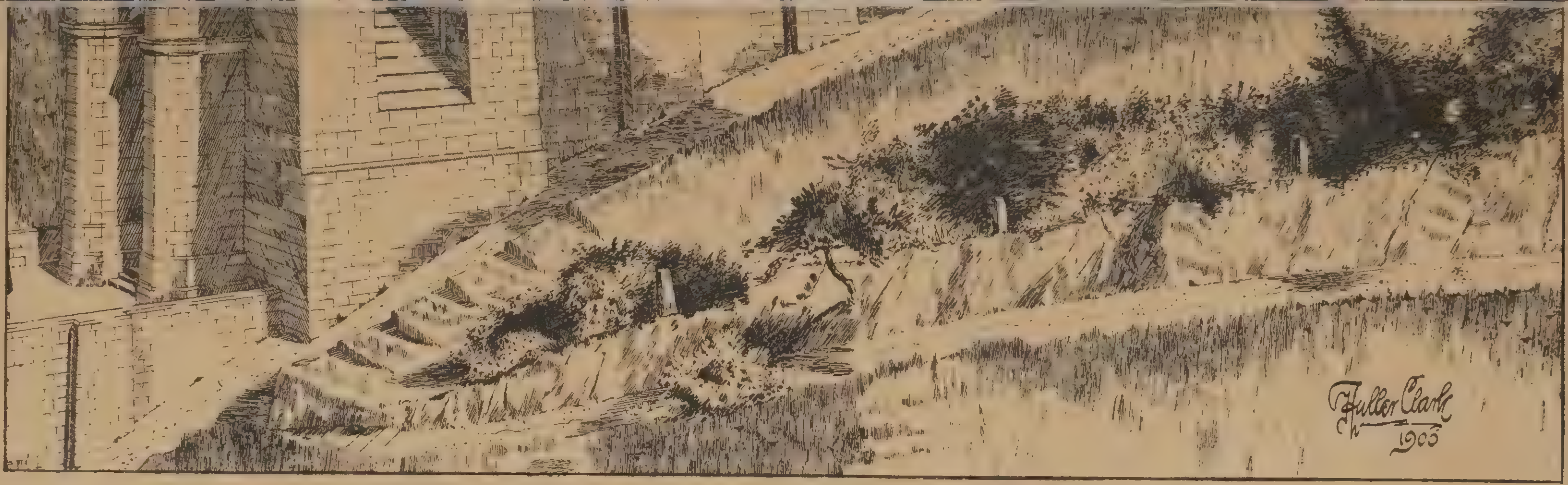

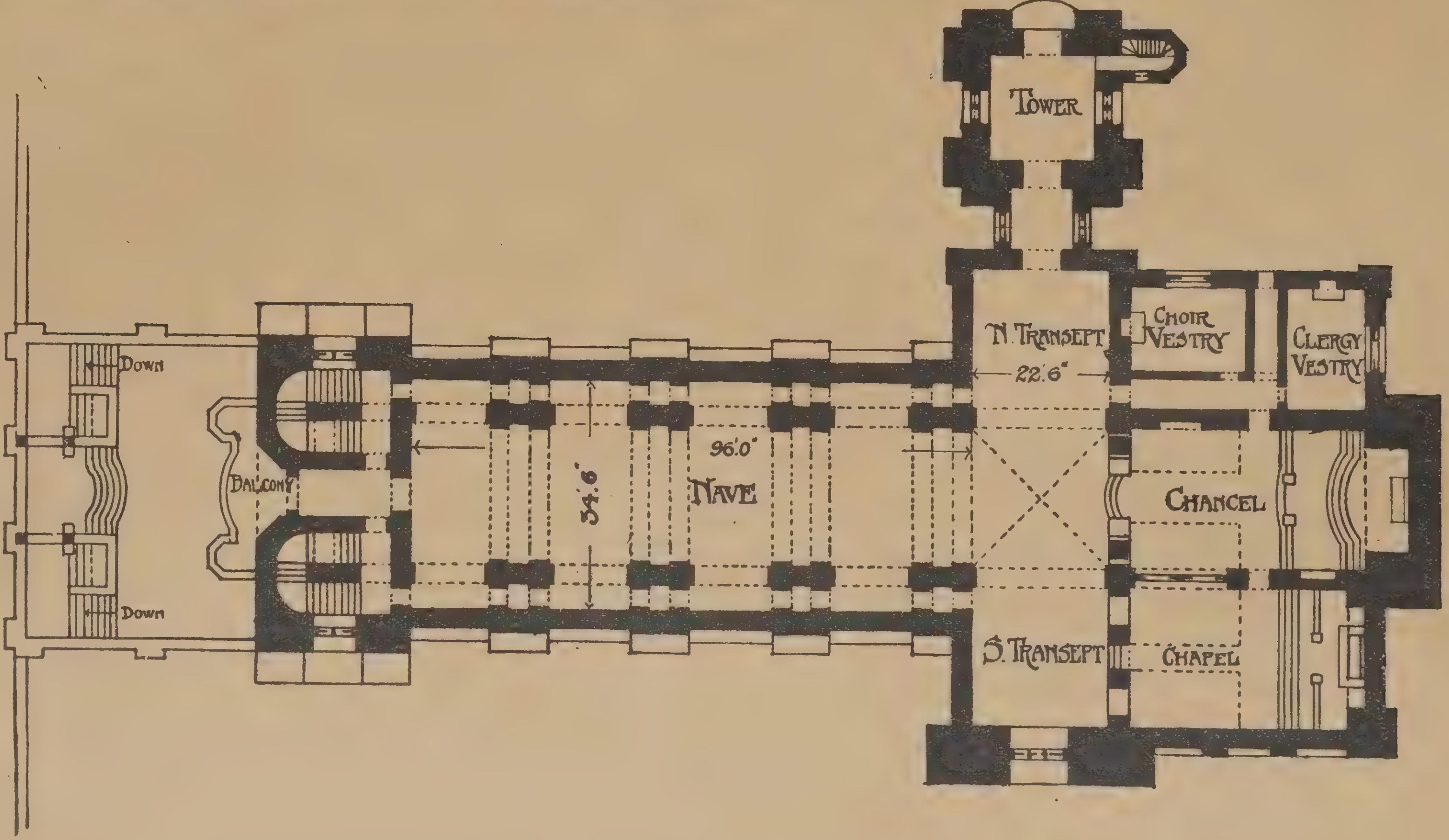

DESIGN FOR A GARRISON CHURCH. H. FULLER CLARK, Architect.

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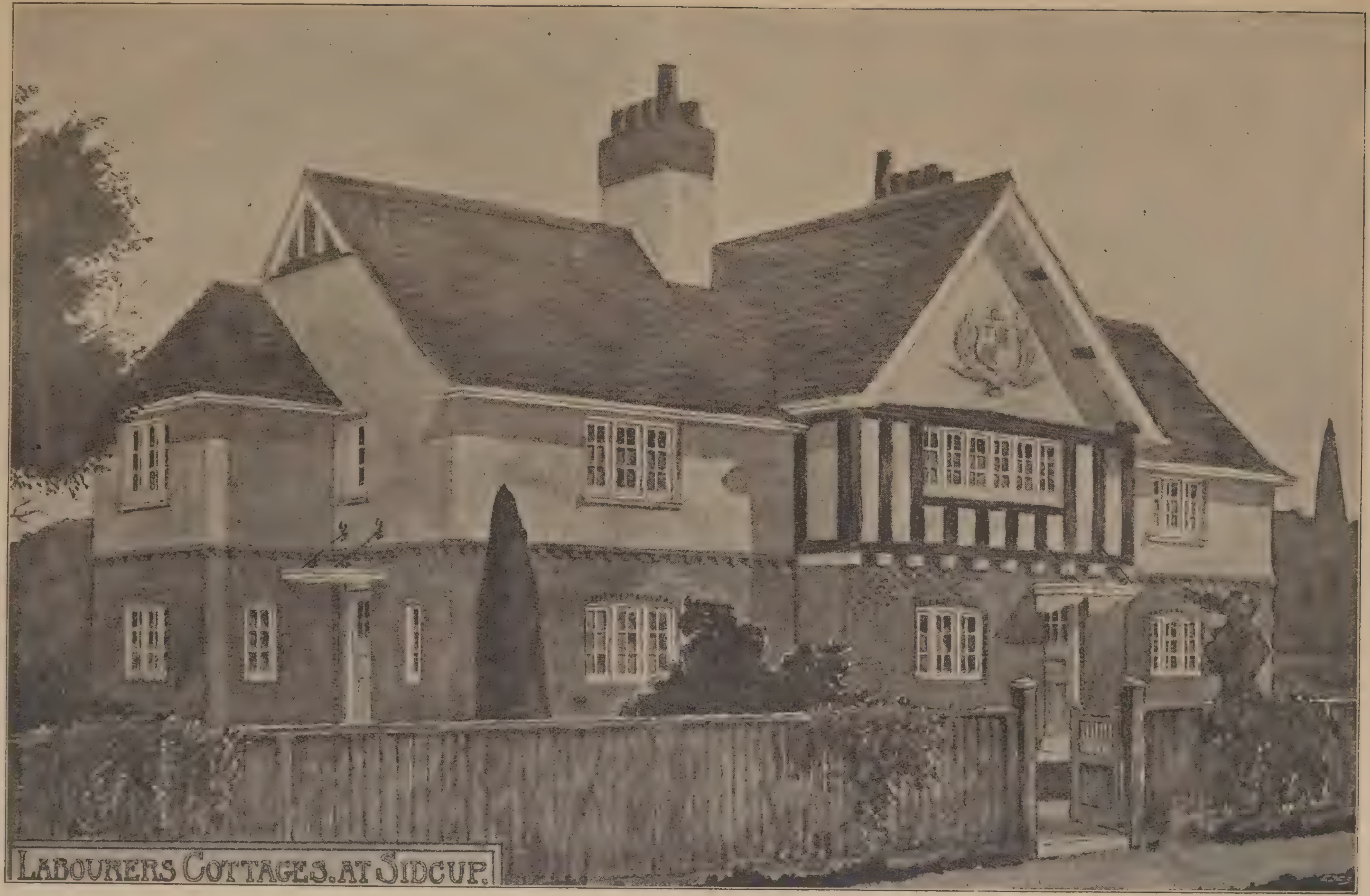
Wednesday, June 12th, 1901.


LABOURERS COTTAGES. AT SIDCUP.

E. HARDING PAYNE, A.R.I.B.A., Architect.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

3ricks and Mortar.

ːHORISM FOR THE WEEK.

Art is man's refuge from adversity.

MENANDER.

Our Plates. THE residence for Mr. J. H. Turner is now being erected at arborough from the designs of Messrs. Penty Penty, architects, of York. The materials iefly used are sandstock facing bricks (2½in. ick) with rubber arches and quoins, and finely oled Gazeby stone for dressings. It is intended cover the roofs with sea-green Westmorland ,tes, laid in courses which diminish in size om the eaves to ridge, the coverings to ridge d hips being of lead. The internal finishings d decorations will be designed by the archi- ;ts.—The block of three cottages at Crescent rm, Sidcup, by Mr. E. Harding Payne, R.I.B.A., was erected last year for the Hon. ırsham Townshend at a total cost of £885, :luding drainage and fencing, by Messrs. ebbings & Pannett, Shirley Works, Sidcup. ound floor and bedrooms plans of the cottages ll be found on page 361 of this issue.—As ;ards the design for a garrison church by r. H. Fuller Clark, of John Street, Bedford ›w, W.C., owing to the steepness of the site, e nave would be approached at the western trance by two stone staircases each 5ft. wide. e tower would be 116ft. high from the ground that point to the cornice, and similarly the :stern facade would be 105ft. high. The ıole would be constructed of Chilmark stone th Broseley tile roofs, the crucifix and kneeling ures at tower and the bands at western trance being of bronze.

Church Spires. MR. WILLIAM ANDREWS, writing in the "Church Bells," rs : "The exact time when the spire was introced into church architecture is not known. In e fourteenth century church-building reached highest state of perfection, and to this century long our most famous spires. Some districts e noted for their spires : Northampton is led 'the county of squires and spires.' The ne valley from Northampton to Peterborough known as the 'Valley of Spires,' and has thin its borders some really fine examples. nnyson has given a world-wide fame to the l spires of Coventry. The spires of Lichfield, own as 'the Ladies of the Vale,' are much nired. The Salisbury and Norwich spires are ted for height, Louth for beauty of outline, l Grantham for elaborate details. The tallest re in this country at the present time is isbury. It runs from the centre of the main nsept to the height of 410ft. Old St. Paul's s 520ft., and the one at Lincoln, destroyed 1548, reached 524ft. After the storm of)3, Salisbury spire was, under the direction Wren, braced with iron to repair some damage tained. On June 21st, 1741, it was struck by ɿtning, and set on fire, but did not suffer any ious damage. It underwent expensive repairs 1827. The name of the architect is not own, nor the date of its erection, but it most ›bably belongs to the earlier years of the rteenth century. In the latter half of the rteenth century Bishop Percy raised the noble re of Norwich. It is a notable feature in the stern Counties, and may be seen at a distance twenty miles. It has also suffered from ıtning, being struck about a century after erection. In 1629 the upper part of it s blown down, and rebuilt four years later. e spire of Chichester Cathedral was 271ft. height, and was erected in the fourteenth tury over a rotten substructure. On the ht of Wednesday, the 20th of February, ;5, a heavy gale occurred. The next day, ›ut twenty minutes past one o'clock, the re was observed to suddenly lean towards south-west, and then to right itself again. n after it disappeared into the body of the hedral, sliding down like the folding of a ·scope. Only the coping-stone and the weather ıe fell outside ; the rest of the masonry formed uge cairn in the centre of the edifice, which s practically cut into four portions by the :ck. The present spire was completed in 7. The spire of St. Mary Redcliffe, Bristol, e pride of Bristowe and the Westernland,' 300ft. in height. This church has some ıous literary associations, the chief being those gathered round the name of the poet Chatterton. Louth spire in Lincolnshire rises to 294ft. in height. In 1843 it was struck by lightning, but steps were at once taken for its restoration, and it was completed three years later. Grantham, also in Lincolnshire, is 295ft. in height. It has a light and graceful appearance, and is richly ornamented with sculpture. It has twice suffered from lightning, namely, in 1797 and again in 1882. After the latter year sixteen feet of masonry had to be taken from the summit and rebuilt."

Old Houses in Cripplegate. DEMOLITION of the Quest House and the four shops belonging to the parish of St. Giles', Cripplegate, for the improvement of that particular part of Fore Street, is pending. When eventually the buildings are removed, they will throw open to the public view the church of St. Giles', which now is entirely hidden ; indeed, at the time of their construction two of the windows of the church were completely blocked. These windows, it may be observed, will when reopened bear memorials of the escape of the church from the Great Fire of 1666, and from that of three years since. Without doubt the Quest House was built before 1564, as in that year mention is made in the hustings deed of the Corporation record of the "Common Hall" of the parish, whilst eighteen years later it is distinctly alluded to by name. As no reference is made in the parish records to the rebuilding of the Quest House, it may be taken for granted that the original building is the one still to be seen, though it has from time to time been repaired. With regard to the shops the origin of their existence is peculiar. In 1654 the parish seems to have had an adequate amount of money for benefactions to the aged poor, but no provision for the clothing of poor children. Having in some way realised £260, the vestry determined to supply the want. Part of the churchyard was eligible as a building site, and four shops were erected on it and let at a rental of £6 apiece, with a fine of £10 for three and of £14 for the fourth, the income derived from this source constituting the children's charity. The gateway, on which may be seen hour-glasses and skulls and bones, is to be preserved, though it will have to be removed for that purpose. There were many oil paintings of various parochial celebrities in the Quest House, but these, together with various prints and views, have been removed to the vestry-room at the Cripplegate Institute, which is now the parochial centre of business.

The Housing Problem. THE Workmen's Housing Council arranged a delegates' meeting of their various affiliated societies last week to hear an address from Mr. Raymond Unwin, architect, of Buxton, on the housing question, with special reference to the planning of houses for artisans. Mr. Unwin opened by a reference to the influence of ground values upon the problem, and recommended that as a general policy artisans' houses should be built in the suburbs. Fresh air for all the rooms was essential. No house should have the living rooms facing north, and this would necessitate the making of streets running east and west. Quadrangles were preferable to streets, so that everybody would benefit by the space usually wasted in back courts. To make a woman spend her life gazing into a backyard was a cruel mistake. The prime consideration of the plan should be a large living room without any obstruction of sunlight. Everything should be sacrificed to attain a good living room ; and to secure the utmost possible air space and sunlight he would abolish passages and landings, have an open staircase in the room, and there should be no projections in the building. A strong believer in co-operation, Mr. Unwin would establish a common laundry for each block or quadrangle. One of the benefits of Mr. Unwin's system would be the saving of the cost of yards and fences.

The R.I.B.A. Officers. THE following officers of the Royal Institute of British Architects have been elected for the ensuing year : President, Mr. William Emerson ; hon. secretary, Mr. Alexander Graham, F.S.A. ; vice-presidents, Messrs. John Belcher, A.R.A., T. E. Collcutt and John Slater, B.A. Lond. ; members of council, Messrs. F. T. Baggallay, G. F. Bodley, W. D. Caröe, W. M. Fawcett, Ernest George, J. A. Gotch, G. E. Grayson, E. A. Gruning, E. T. Hall, H. T. Hare, E. W. Mountford, Professor Beresford Pite, G. H. Fellowes Prynne, P. G. Smith, Leonard Stokes, R. Phenè Spiers, Paul Waterhouse, Aston Webb ; associate-members of council, Messrs. R. S. Balfour, W. H. Bidlake, J. S. Gibson, H. V. Lanchester ; representatives of allied societies, Messrs. J. J. Burnet (Glasgow Institute of Architects), Frank Caws (Northern Architectural Association), C. H. Channon (York Architectural Society), A. Clyne (Aberdeen Society of Architects), Sir Thomas Drew (Royal Institute of the Architects of Ireland), F. H. Oldham (Manchester Society of Architects), S. P. Pick (Leicester and Leicestershire Society of Architects), F. W. Wills (Bristol Society of Architects), Butler Wilson (Leeds and Yorkshire Architectural Society) ; representative of the Architectural Association, Mr. W. H. Seth-Smith.

Exhibition of Works in Wood. AN exhibition of works in wood and wood carving submitted in competition for prizes offered by the Worshipful Companies of Carpenters and Joiners was opened last Wednesday at Carpenters' Hall, London Wall, E.C., and remains open until Tuesday, June 18th (inclusive), from 11 a.m. to 6 p.m. : and, in addition, on Friday and Monday next from 7 p.m. to 9 p.m. The constructional work exhibited is far superior to the art attempts in wood carving, &c. ; indeed, failure accompanies almost every attempt at artistic effect. The models of constructive carpentry are most neatly and accurately made to scale, but one feels that the exhibitors must nearly all be joiners with very little acquaintance of actual carpentry work, executed in unplaned, roughly hand-sawn and framed work. The models are almost like cabinet work, and show an expensive and wasteful use of material. The prizes have been distributed in seven divisions, the first for constructive carpentry, the second for ornamental carpentry, the third for joinery, the fourth to "the trade" for cabinetmakers and art woodwork manufacturers, the fifth, sixth and seventh for hand carving. In division 1 a special gold medal is rightly awarded to Mr. J. Colburn for a model of an elaborate, yet simple, centering for a masonry arch. The majority of the other examples of centering are needlessly elaborate. The models of roof trusses are on the whole good, but include many examples of wasteful cutting away of material from larger sizes than required, this being especially noticeable in the King posts, and of excessive morticing and tenoning. There is a good model of a derrick for two cranes by Mr. F. S. Judd which gains a first prize, but the ties being so large would be weakened by jointing. The designs for wooden and half-timbered dwellings shown are not at all good in proportion or mass. In division 2 Mr. W. E. Saunders gains a special gold medal for a model of vaulting. In division 3 there are several examples of rounded work, of course unsuitable to wood. Mr. C. E. Hadlow gains a first prize in class 2, division 3, for a sash frame, weightless and with lock ventilation, ingenious but possessing the disadvantage that the sashes can never be opened more than half-way top and bottom. In class 3 Mr. G. Ellis gains first prize for a French casement with new weather-proof joints, which, however, would be sure to sag in time and swell with wet so as to cause sticking—the common failure with wood casement joints. The wood carving in general, while it exhibits an attempt to imitate Nature, is not conventional in rendering, so that it necessarily fails. The nature of wood is not generally considered in the designs ; thus we have corn stalk, leaves, &c., in wood, which would break off with a slight touch, and the decoration is often carried over the architectural lines. In fact, this part of the exhibition is very disappointing, and want of taste is everywhere in evidence. A good collection of old examples of work is shown. In concluding, we may say that these two City companies are doing excellent work by holding these competitions which are sure to be of value in encouraging good work ; the judges, too, have ably performed their duties.

THE ASSYRIAN ELEMENT IN GREEK DECORATIVE ART.

BY FREDERICK S. SALISBURY, B.A.

IN the decorative application of sculpture and colour the habit of the Greeks was diametrically opposed to our own; and the explanation of this difference lies largely in the climatic environments of the two peoples. Under the cloudy heavens of Northern Europe the greater part of most men's time, when not hurrying along the street on business or engaged in exercise, is spent indoors, and internal decoration, therefore, is far more elaborate and costly than external. Under the sunny skies of Greece the opposite was the case, and accordingly much more attention was devoted by them to exterior adornment.

A striking illustration of this is to be noticed in the use of friezes. In Greek temples they are found outside, either on the central member of the entablature or around the top of the cella wall. The frieze of an Ionic temple is brought to England and arranged round the interior walls of a room in the British Museum; here it is studied, and in this position is reproduced below the cornice of a spacious hall or gallery. Briefly, it has been transferred from the outside to the inside. This may be called the domestic aspect of the question, and it goes hand in hand with the fact that, whereas in England private houses of large dimensions and noble architectural proportions are fairly numerous, in ancient Greece they are mainly conspicuous by their absence.

Working in the same direction is the influence of artistic considerations. Feminine costumes enliven the crowd at any large open-air function with all the colours of the rainbow, and while the sun shines the sight is gay indeed. But a passing cloud obscures his light, and lo! the picture is all blurred, the shades and tints grow indistinct, and the hitherto pleasing picture is wrapped in a shroud of gloom. It is not worth wearing those dresses under the dull grey sky. And that which is true in little holds also in larger things. Apart from its economic aspect, external decoration in colour would in this country be largely thrown away; and, were it to gain a footing, would tend to die a natural death simply from inanition.

And the same argument applies to the play of light and shade over a surface sculptured in relief or a group of figures in a pediment. The subtler shadows in the finest work are lost unless it can be seen under a brilliant light; and because the Panathenaic frieze from the Parthenon was, in its original position, entirely in the shade, and 39ft. from the floor of a colonnade only about 10ft. to 11ft. wide, we must not jump to the conclusion that Greek taste regarded this as an ideal position for such a decoration, nor smother reason by blindly following a famous precedent.

And here, perhaps, a word may be fitly spoken from the economic point of view. To the exterior sculptural decoration of Greek temples was devoted some of the best talent at command. The Pediment group of the Parthenon, the temple of Æsculapius at Epidaurus, and of Athena Alea at Tegea, were probably executed by subordinates; but there is little doubt that they were carved from the models of Phidias, Timotheos and Scopas, and these masters may even have given the finishing touches to work which they certainly superintended. To expose such productions as these to the mercy of English weather would be a species of improvident vandalism, and even protection from rain and storm would only avoid one, and perhaps not the worst, of two evils. The numerous works of art recently raised from the sea about the island of Cerigo, at the south of Greece, have suffered great damage from water, but the contaminated air of our great cities is probably a corroding agent hardly less effective.

The influences on decorative treatment of climate and the resulting habits of life, and of atmosphere, and the consequent tone of taste have been briefly passed in review; but the main purpose of this paper is to consider, in the case of the ancient Greeks, a third element—the influence of Oriental tradition.

Greek art, particularly in its earlier stages, was very largely influenced by the art of Assyria. Now Assyrian art was chiefly decorative, and we shall therefore expect to find its presence principally in this department.

The city of Ecbatana, the capital of ancient Media, was surrounded by seven concentric walls. Built as it was upon a conical hill, the upper courses of all the seven walls were visible at once, and each was coloured a different hue. The highest and inmost wall was gilt; the next was plated with silver; the third was painted orange; the fourth, blue; the fifth, scarlet; the sixth, black; and the lowest and outermost, white.

The public buildings of the city were also marked by the same gorgeous magnificence, and the ceilings, beams and rafters of the royal palace were overlaid with gold and silver. Everything is costly, brilliant, splendid, sumptuous—that, not beauty, is the ruling aim. In fact, Ecbatana is a fairly complete example of the notions which we are wont to associate with the word Oriental.

On the other hand, the art of Greece is marked by chaste simplicity. There is no striving after effect; no forced display. If it is costly, it is only so because it is solid and good throughout. Its end is beauty, and above all simple beauty. Elaborate beauty, vastly planned, achieves magnificence. That is the goal of Oriental effort. It dazzles, but it does not satisfy. The goal of Greek endeavour was the Ideal, and to this they found the only royal road—simplicity. Dio Chrysostom declared that he who visited the temple of Jupiter at Olympia and beheld the Zeus of Phidias, no matter what sorrow and anguish had fallen to his lot in life, would find forgetfulness of all his pains in gazing on that divine and tranquil face. Such art ministers peace; such beauty satisfies.

But this perfection belongs to those two momentous centuries which succeeded the life and death struggle with Persia. That struggle marked a complete rupture with the East, in art no less than in politics. Previous to B.C. 480 the traces of Oriental influence are numerous; and not the least striking example of this is to be found in the application of brilliant colours to architectural decoration.

M. Cavvadias, of Athens, while excavating among the débris left by the destruction of that city by Xerxes, unearthed to the south of the Parthenon a group of pediment sculpture representing Zeus hurling thunderbolts at the three-headed, triple-tailed monster Typho. The work is in a markedly archaic style, and the characteristic smile which the turned-up corners of the lips give to Typho's three faces makes him appear as though he was positively pleased at the energetic attentions of the Father of the Gods. But it is not with style that we are specially concerned now. The group is of importance here as a remarkable example of the application of bright colours to sculpture.

Typho presents us with a vivid anticipation of the cruel Chevalier Raoul, the Blue Beard of the familiar French story. His hair was coloured a bright blue; the flesh was painted red, as in early times was the body of a victorious Roman general when celebrating a triumph; and the ball of the eye was yellow, with the iris green and the pupil black. The reasons for this colouring were twofold. The coarse grey tufa which the sculptor had used presented a dull and unpleasing surface that invited concealment, and the contours, wanting the crystalline glitter of marble, would often be lost in the shadow of the cornice unless picked out with vivid contrasts of colour. But if artistic exigence had much to do with their use, there is little doubt that it merely suggested a case for the application of an already familiar tradition; and the source of that tradition was the East. With the exception of the green we find all the colours on the seven walls of Ecbatana.

This example must suffice on the question of polychromy. But our description of Ecbatana suggests another form of architectural decoration which leaves many traces in early Greek building. We refer to the use of metal, chiefly silver and gold, or, where gold was too costly, bronze.

Of this Homer gives us several examples. Telemachus, accompanied by the son of Nestor, journeys to the house of Menelaus at Sparta, seeking tidings of his father Odysseus. Homer (Od. iv. 43) describes how, as they were conducted into the palace of the god-descended monarch, they marvelled at its splendour, for its glitter was like that of the sun or of the moon. And the explanation, clear enough already, is given a few lines further on. Telemachos, as Pope translates, or rather paraphrases him, thus addresses his companion:—

> "View'st thou unmoved, O ever-honoured most!
> These prodigies of art, and wondrous cost!
> Above, beneath, around the palace shines
> The sumless treasure of exhaustless mines;
> The spoils of elephants the roof inlay,
> And studded amber darts a golden ray."

Well, this is very fine, but Homer does not say that the ivory was inlaid in the ceilings. He merely speaks of "the gleam of bronze throughout the echoing halls, of gold and amber, of silver and of ivory"—two yellow and two pale materials.

Still more complete is the description of the house of Alcinous in the fabled isle of the Phæacians, the chosen children of the sea-god. The threshold is made of bronze. Of bronze also are the walls that enclose the large front hall of the palace, and round them runs a frieze in a pattern of blue glass.* Silver doorposts stand on the bronze threshold, and the lintel above is of silver, while the doors themselves are gold.

In the Iliad the houses of the gods are several times mentioned. The house of Poseidon is made of shining gold, imperishable for ever; that of Hephæstus, built by the god himself, is fashioned of bronze; and so are the halls of Father Zeus, where the assembled gods were seated on thrones set out upon a golden floor. And further examples, legendary and otherwise, are found outside of Homer. Pausanias records the tradition that one of the earliest of the buildings which preceded the stone temple of Apollo at Delphi was constructed of bronze; and the same writer says that he saw at Argos the bronze chamber in which Acrisios shut up his daughter Danaë, and where Zeus visited her in a shower of golden sunbeams.

For the most part this use does not survive the Persian wars, though the gold and ivory statues by Phidias and others are in a measure its continuation. But Oriental influence leaves a great witness in the Ionic frieze. The Bronze Gate of Balawât, erected in the ninth century B.C., represents in long lines of low relief the victories of Shalmaneser II. Had Homer sung the exploits of the Assyrian monarch instead of the Siege of Troy, the Iliad would have presented an exact literary counterpart to the Balawât Gate. The Iliad and Odyssey date from the time when, as we have already seen, Oriental influence was very powerful in Greece, and if their genius is Hellenic, they are modelled on an Eastern plan.

After the Persian wars the epic in Greek literature is a thing of the past, but its spirit survives in the continuous Ionic frieze, which is fitly applied to the Ionic temple, with its Oriental tendency to elegance as distinct from simplicity. The Ionic order in architecture savours, however faintly, of the East. The true expression of the Hellenic spirit is embodied in the simple, unaffected beauty of the Doric order. Its style is as dignified and chaste as a play of Sophocles, while the ornaments of the Ionic reflect the elaborate grandiloquence of an official Assyrian record. Its plainness is that of an undraped athlete statue from a Peloponnesian studio, as contrasted with the costly elegance of "garments of needlework, wrought about with divers colours." And as if to make the antithesis more complete, just as Homer is represented by the Ionic frieze, so the frieze of metopes in the Doric order has its counterpart in the acts and scenes of a Greek drama, each forming part of a series with its neighbours on either side, but each presenting in itself a complete artistic whole.

It should, however, be remarked that the analogy between an Ionic frieze and an Assyrian record is only external. The archives of the kings of Assyria go on unrolling for ever, and have artistically neither beginning, climax nor conclusion. Greek art, on the other hand, while adopting the tradition, has made it conform to its own cardinal sense of balance and symmetry; in this, as in all else, manifesting the vigorous originality which pervades every department of Hellenic activity. The Lucretian maxim, *Ex nihilo nihil fit*, is true of all things material and intellectual; but if the Greeks borrowed perforce from other sources the elements of their arts and letters, the manner in which they employed and applied them was essentially their own.

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* A frieze of this kind was discovered by Schliemann in his excavation at Tiryns in the Argolid.

CONCRETE SUBWAYS FOR UNDERGROUND PIPES.

A PAPER on the above subject was read by Mr. Arthur Taylor Allen before the Society of Engineers on June 3rd.

In introducing the subject the author referred to the construction of the first subway in England for underground pipes, which took place about the year 1860, in the city of London. This was followed a year or two later by one in the city of Nottingham. He noted the lack of progress there had been in the extension of these new arterial thoroughfares, for, beyond one being constructed at St. Helen's in 1898, very little had been done in that direction to minimise the evil resulting from the continuous breaking up of roadways for access to the numerous pipes laid under every thoroughfare. He gave a long list of streets broken up in the course of one year for obtaining access to pipes. He also pointed out the danger and inconvenience likely to arise from roadways being laid over a number of gas pipes.

The author referred to the sections of the various Acts in force empowering public companies to break up streets after due notice, causing the total or partial blocking of a thoroughfare, interfering with traffic and operating temporarily to the prejudice of business houses, the owners having no claim for any loss sustained thereby. He then alluded to the increasing number of underground pipes, and the possibility of the provisions of the Rivers Pollution Acts being more rigidly enforced, and in the near future throwing upon some authorities the necessity of separate sewers for surface or storm water. The author then described the subways in London, Nottingham, and St. Helen's. To relieve doubt as to the possibility of a severe frost affecting the water mains in the subways he gave satisfactory thermometrical readings taken in the Albert Street subway, Nottingham.

Turning next to the utility of subways, the author stated that by their construction access could be readily obtained for the purpose of inspection, alteration, or addition to any of the pipes at present hidden and placed beyond inspection. He drew attention to the fact that after works of great magnitude had been undertaken in obtaining a pure water supply, to ensure the health and safety of the population, the pipes conveying the supply were hidden. Thus, a defective joint or a burst might remain undiscovered for a length of time, as was the case some years ago, when the first intimation of a leakage in the borough water mains was reported to him by the sewer men when repairing a sewer in close proximity to the mains.

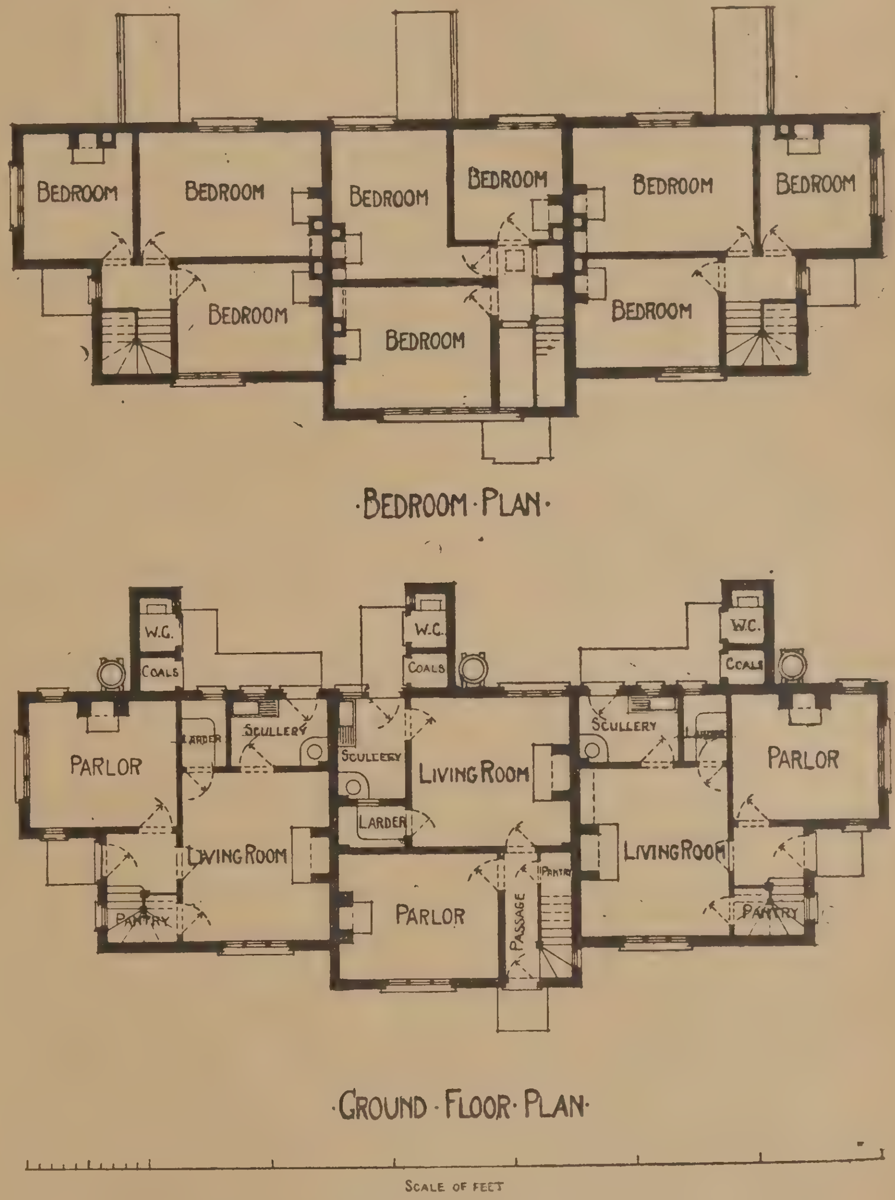
An efficient system of detection and prevention of water pollution or waste would be provided for by subways, and the life of iron pipes would be considerably increased. Electric and telegraph wires need no longer run along poles and roof fixtures; they could be put underground, thus rendering them less dangerous and more reliable and permanent. Having regard to economy of cost, capability of resistance, and rapidity of execution, the author suggested concrete as the most suitable material for such works, and referred to its practical value as exemplified by its extensive use in connection with works in general.

In dealing with subways for large cities and busy thoroughfares where foot passengers experienced difficulty in crossing the street in safety, the author recommended that, in conjunction with the subway, underground conveniences should form a part of the scheme. Entrances would be erected in the centre of the street, so arranged that an easy and ready access (although private) could be gained from the first landing. This might be regarded as a peculiar suggestion, but he alluded to the revenue it was possible for it to bring in, as much as from £200 to £2,000 per annum having been cleared as profit for such accommodation.

With regard to subways for suburban districts the author considered all large subways should have lateral ways about 3ft. wide by 4ft. 6in. high for the purpose of access and conveyance of gas, water and other pipes, and he advocated making use of every available space by a specially designed iron bracket for the pipes. The author submitted a proposal for a subway under each footpath of all new streets to receive the water, gas and other pipes, the subways to form part of the laying out of the new street. He considered it necessary that the gas and water mains should be in duplicate; the concrete wall nearest the house would be perforated with 2in. and 2½in. holes for the house services, thus obviating the construction and expense of lateral ways.

The sewer would be laid under the road with the usual manholes on the principle adopted in the present day, but with the addition of elongated eyes every 20ft., extending to each subway. The chamber (common to all house drainage) to be constructed in the bottom of the subway by and at the cost of the owner when requiring to connect with the sewer. This method he contended would ensure the surface of the road being kept free from interference.

The author gave the cost of some subways constructed in London as £15 per lineal yard, Nottingham £10 per lineal yard, and St. Helen's £7 2s. 4d. per lineal yard. He pointed out, however, that the information was of but little practical value, and must be accepted with the greatest caution, it being impossible to make a useful comparison between the cost of construction at other places without a knowledge of the conditions of each case. Although the initial cost would prove heavy, he pointed out that there might be some compensation if the excavated materials proved suitable for the concrete work. The auther considered that the cost of constructing subways should be borne by a loan for a period of fifty years, as the works come under the category of permanent works.



COTTAGES AT SIDCUP. E. HARDING PAYNE, A.R.I.B.A., Architect.

SOUTH-EASTERN RAILWAY IMPROVEMENTS.

A New Railway Station at Tattenham Corner.

A NEW station situated at Tattenham Corner, immediately overlooking the Epsom Racecourse, has been opened by the South-Eastern and Chatham Railway. From London the new line runs by way of East Croydon, through the Chipstead Valley. Stations have already been opened on this railway at Chipstead, Kingswood and Tadworth. The station, commanding an excellent view of the greater part of the course, stands 500ft. above the sea level. It covers a large area of ground, and is not yet wholly utilised. Six platforms, ranging from 550ft. to 700ft. in length, have been brought into use, and there is ample room for the introduction of others, as the traffic may develop. In the siding refuges space is available for at least 24 long trains, and the whole of these can be started in quick succession, without the least confusion. It is in contemplation to erect permanent station buildings, but, in the first instance, large timber structures, including booking offices, refreshment-rooms, waiting-rooms, parcel and telegraph offices, have been provided.

As soon as the company find it possible to complete the numerous changes which are in progress on the Metropolitan sections of their system, the ordinary service to and from the Chipstead line is to be much improved.

Facilities are about to be afforded for the ever-increasing volume of what is known as the *grande vitesse* goods traffic, consisting of fruit, flowers and other perishable or fragile goods, which, coming from the Continent, as also from Kent, requires the quickest possible transit. At the present time, this branch of traffic is dealt with in the low-level station at London Bridge, which formed part of the old Greenwich Railway; but it is about to be transferred to a station which has been specially erected near Blackfriars Road, and the low-level station at London Bridge will thereafter be converted into a passenger station of the most approved type. The new station covers an area of 13,000 sup. yds., or about two and two-third acres, and contains solidly-built covered platforms so arranged that goods may be taken out of railway trucks at one side, and at the other transferred to carts for delivery to the distributing agents. Together, the platforms have a total length of 1,216 lin. ft., which will enable as many as sixty-four railway trucks to be unloaded simultaneously. Between the platforms there is a cart road, 460ft. long and 40ft. wide, laid at a level of about 25ft. above the street. The station is approached from Blackfriars Road by way of George Street, through an avenue 800ft. long and 24ft. wide, with a gradient of one in 18½ft., and from Southwark Street by a road possessing a similar gradient. Trains will enter the station at one end from the main line of the South Eastern, and at the other, by means of the Blackfriars Junction, from the Chatham section, as likewise from the Northern systems. Two warehouses have been provided at the depot—one on the platform level, and another which will be entered from Gravel Lane. There is also accommodation for loading horses, and it is proposed to use the stations for sending away guns and munitions of war. The premises further contain a small locomotive depot, with a turn-table large enough to receive the powerful engines now being supplied to the Company, and, beyond supplying local requirements, this table will relieve much of the congestion experienced in dealing with the traffic in and out of Cannon Street Station.

A third improvement is the reversal of the old Greenwich lines, which for half a century have been worked inversely to the principle obtaining over the rest of the system, a widening of the original railway effected in 1850 having necessitated the construction of a line on the wrong side of the road, in which position it has ever since remained. The points have now been altered, and each pair of metals put in its proper position, so that the company will now be at liberty to widen the viaduct on the north side, and thus render possible efficient working over the busy section between London Bridge and Surrey Canal Junction.

The viaduct between Charing Cross has been widened to the Borough Market. The widening between St. John's and Orpington has advanced considerably. This improvement includes the reconstruction of the stations at Hither Green, Grove Park, Chislehurst and Orpington, together with the erection of an intermediate station, to be known as Elmstead Lane, situate between Grove Park and Chislehurst, which last-mentioned station is, for a time at least, to be regarded as the outer limit of the company's suburban traffic. A large amount of new stock has during the past twelve months been supplied to the South-Eastern and Chatham system, and much of this will be available for the summer traffic. The whole of the passenger stock, new and old alike, is being fitted with the electric light. Many new engines have also been provided, more powerful than those of the old design.

The improvements enumerated do not represent all the details of the elaborate scheme to which the directors are devoting attention. Much has still to be undertaken on the Chatham and Dover section, and the latest proposal is to construct an overhead electric railway between Cannon Street and London Bridge, immediately above the existing line. Plans for this project have not, however, as yet taken definite shape; but the proposal is to work the overhead route on the same principle as that sanctioned by a Select Committee of the House of Lords in connection with the contemplated mono-railway from Manchester to Liverpool. A frequent service of trains would be provided between Cannon Street and London Bridge, and the existing congestion at the former station would thus, it is claimed, be completely removed.

GLASGOW ROYAL INFIRMARY.

Dr. Rowand Anderson replies to the Committee.

THE latest phase in the discussion relative to the reconstruction of the Royal Infirmary at Glasgow is the publication in the "Glasgow Evening Citizen" of a letter from Dr. Rowand Anderson (the assessor in this competition). In this letter he flatly contradicts some of the remarks made in the public statement of the Executive Committee, of which a full report was given on page 321 of our issue for May 29th last. In his letter Dr. Rowand Anderson says:—

The committee, in referring to me, say that my function, as I frankly acknowledge, was to "guide, and not to select." Sir David Richmond stated publicly that I was engaged as "technical adviser, and not assessor." My appointment, as stated in the minutes, is in the following terms. "The sub-committee thereupon agreed to appoint, and hereby appoint, Dr. Anderson as assessor to the committee." In the printed terms and conditions of competition issued to architects, it is stated that the committee "will appoint a neutral architect of standing as assessor, and will give the fullest consideration to his advice."

The committee then proceed to say that one of the two plans which most closely conformed to the sketch plans issued for the guidance of competitors was not included by me in the short leet, and "that further interviews with me satisfied them that its exclusion arose from no failure on the part of the selected plans, in regard to vital or essential particulars, but chiefly from a difference of opinion in regard to the style of architecture and the general elevation, matters on which the executive committee ventured to think they were quite entitled to follow their own opinion, and the minority cordially acquiesced in the selection of the majority."

From the above statement, it appears that the Executive Committee considered themselves quite competent to judge, not only of the technicalities of the building as an infirmary, but also of its architecture. That being so, one naturally asks why they called in an assessor.

In proof of their competency to judge and decide on all matters connected with the building, they state that the minority cordially acquiesced in the selection of the majority, which majority consisted of one. This majority would have been converted into a minority but for most unfair canvassing of the committee before I gave my final explanation.

Had I known of this in time, I would have thrown up my commission.

It is entirely wrong to lead the public to believe that it was solely on account of the architectural treatment of the design they selected that I did not include it in the short leet. I gave the most minute and searching examination to every plan submitted in the competition, and, in arriving at a decision, I attached supreme importance to those qualities which constituted, according to my view, a scientific building, and one adapted to its purpose, and I maintain that the one I placed first embodies a greater number of merits than any of the others.

The committee believe that they have shown discretion in approving the architectural style of the adopted plan, and they say "it is distinctively Scottish—the national art of the fifteenth and sixteenth centuries, of which we have examples in Heriot's Hospital, Holyrood, Linlithgow, and Falkland Palaces, and in our own college lately in the High Street. It is, therefore, not only appropriate to the historical associations of the site upon which stood the castellated Bishop's Palace, but permitting as it does a limited use of Gothic forms, as in Heriot's Hospital, Edinburgh, it is more in harmony with the cathedral itself than any classic or modern style." Ranker architectural nonsense than this was never penned, and whoever composed it is absolutely ignorant of the meaning of the terms he uses. I fail to see what associations there can, or should be, between a building dedicated solely to the relief of suffering humanity, and one erected in a semi-barbarous age, and built with appliances for dealing death and suffering outside and cruelties and torture inside.

If the relief of the sick and the hurt is to be the one paramount object of this building, that can only be accomplished by utilising to the utmost the beneficent and curative forces of Nature and the teachings of science, and not by erecting and wasting money on the ghastly absurdity of a baronial infirmary.

Engineering Notes.

The New Orphanage, Bontnewydd, Carnarvonshire, is being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

The New North London Underground Railway, which will bring Finsbury Park within about ten minutes of Moorgate Street, is being pushed forward rapidly. The contractors expect to finish the tunnelling by the end of the year. The tube will be 2⅝ miles long and 16ft. in diameter—the largest in London, the Central London Railway being 11ft. 8in. The Great Northern and City Railway, as the new line is called, will be the first tube in London to take full-size rolling-stock. It is expected that its terminus in Moorgate Street, opposite the South London Railway's terminus, will ultimately become the City terminus of the Great Northern Railway. The engineers are Sir Douglas Fox and his partners, and the contractors Messrs. S. Pearson & Son, who made the Blackwall Tunnel.

New York Harbour is being improved. The east channel at the entrance of the harbour is to be made 2,000ft. wide and 40ft. wide; its course will be straightened and shortened, and there will no longer be a danger of grounding off Sandy Hook. The contractor has caused two large dredges to be specially constructed for the purpose. A contract has also been made for widening and deepening Bay Ridge and Red Hook channels, both of which are to be made 1,200ft. wide and 40ft. deep. There is a further project for giving the same width and depth to Buttermilk Channel from Red Hook Channel to the East River. Man-o'-War Rock in the East River is to be removed, and the channel off the battery is to be deepened to at least 26ft. It is calculated that the island of Manhattan has already over fifty-five miles of pier line, and that the improvement in question will give large additional facilities.

NEW PUBLIC OFFICES AT WHITLEY.

NEW offices have just been finished for the Whitley and Monkseaton Urban District Council. The walls are faced with deep-red pressed bricks, the oriel and other windows and cornices being of dressed stone. Upon entering the spacious entrance hall, the offices of the clerk and the rate collector are found on the right hand, and those of the surveyor and the sanitary inspector on the left. Each of these offices is about 18ft. by 16ft., and attached to the clerk's office is a strong room for important deeds and other documents. At the back are a living room and a kitchen, with a scullery and other accommodation for the caretaker. On the upper floor is the council chamber, 30ft. long by 18ft. 6in. wide, and 15ft. high. It is constructed with a coved and panelled ceiling, and fitted with two handsome fireplaces and carved oak mantelpieces. Behind the council chamber is a waiting room, with lavatory and other accommodation. These rooms take up the space on one side of the staircase, and on the other side, connected with the the council chamber by a cloak room, are two committee rooms, one about 18ft. by 15ft., and the other about 16ft. by 15ft. Above these rooms are three attic bedrooms for the caretaker. The above comprises the main block, but there are, besides, two separate outbuildings, one being the fire brigade house and the other to provide storage. The whole works have been designed by Mr. J. P. Spencer, architect, of Newcastle-on-Tyne and North Shields, under whose supervision they have been carried out by Mr. James Douglass, contractor, of Cullercoats. The furnishing has been done by Messrs. Gullachsen, of Newcastle, and the total contracts, including furnishing, amounted to £3,400, which will cover the entire cost, as it is expected there will be no extras. This sum does not include the cost of the site, as the ground already belonged to the council.

EDINBURGH ARCHITECTURAL ASSOCIATION.

Some Particulars of the Annual Excursion to Durham and Hexham.

THE annual excursion of the Edinburgh Architectural Association will take place on June 14th and 15th. On the first day Durham will be visited. The cathedral was a church of the Benedictine Monastery, begun by Bishop Carileph in 1093, and practically completed about 1130. The Chapel of the Galilee at the west end was added by Bishop Pudsey about 1175. The Chapel of Nine Altars, replacing the original apsidal termination, was begun in 1242. The chapter-house was demolished in 1796 and restored in 1895. After the cathedral, the deanery will be visited, where the ancient kitchen is still in use.

Then the library. This was originally the refectory and dormitory of the monastery. It contains a valuable collection of MSS., among others some of pre-Conquest date. A large number of Roman altars and sculptured stones are to be seen, as well as an important series of Anglian memorial crosses and grave covers, and the remains of the coffin made to contain the body of St. Cuthbert in 698, together with various articles found in the grave of the saint in 1827.

The next place to be inspected will be Durham Castle, which was built by William the Conqueror in 1072 on his return from Scotland. Of his work there remains the very interesting chapel. The castle contains the two halls built about 1160 by Bishop Pudsey, with the magnificent doorway of the lower hall; the later great hall was built by Bishop Bec (1283-1311), enlarged by Bishop Hatfield (1345-81), and curtailed by Bishop Fox (1494-1501), whose very complete buttery-hatch between the hall and kitchen (Pudsey) remains intact.

At 7 o'clock on Friday evening the members will dine together in the Royal County Hotel. After dinner there will be time to visit St. Giles' Church in Gilesgate, St. Mary-le-Bow in North Bailey, St. Mary-the-Less in South Bailey, St. Oswald's Church in Church Street, and St. Margaret's Church in Crossgate.

St. Giles' Church was founded and dedicated by Ralph Flambard in 1112. The original north wall of the nave and the original font remain. The church was used as a military stronghold, and sustained sieges in 1141 and 1144. The chancel was built by Bishop Pudsey about 1180. A fragment of a gravestone with Norman ornaments may still be seen. The church of St. Mary-le-Bow is the oldest foundation in the city. It probably stands on the site of the old White Church in which rested the body of St. Cuthbert during the building of the cathedral of Aldhun. The present church was built in 1685, the tower being erected in 1702. The church of St. Mary-the-Less has a Norman arch in the porch, and a Norman chancel arch. The reredos panelling is from the cathedral. St. Margaret's Church was built about 1100, the north aisle in 1190, the tower and north and south aisles to chancel towards the end of the fifteenth century. The nave and chancel are original. There is an elliptical chancel arch. St. Oswald's Church stands on the site of the church built by Bishop Carileph, who died in 1095. Part of the cross of the original Saxon church may be seen in the cathedral library. The chancel was rebuilt and the aisle windows added in the fourteenth century; the two west bays of the nave were erected later. The tower and clearstory are of the fifteenth century. North and south porches were destroyed. The south aisle portion of the chancel, clearstory, &c., was rebuilt in 1834, when fine old roofs were lost. The original roof remains on the north aisle.

On Saturday Hexham Abbey will be visited. The interest which attaches to this fine monastic church, and the remains of the conventual buildings in connection with it, cannot well be exaggerated. It is on the site, and still retains in its crypt the superstructure, of the church begun in 673 by St. Wilfrid, which was in all probability the largest and most ornate of such buildings erected by the Angles. Its architectural history is both curious and unique, and forms a most fascinating study. As a specimen of mediæval architecture, Hexham Abbey Church forms a connecting link between the great Yorkshire abbeys and the contemporary work in Scotland. The choir is a valuable example of the period when the transition from Norman was merging into the Early English style. The transepts are of extreme length and great beauty, and contain the best remaining example of the night-stairs to the dormitory. The ruins of the domestic buildings include the gate-house, the chapter-house, the calefactory and the lavatory, with a mere fragment of the frater-house. The lavatory is a most beautiful and perfect composition of the Geometrical Decorated period. The church contains the more ancient of the only two remaining sanctuary seats in England, and also possesses an abundant store of woodwork, furniture and paintings on panel. In the aisle of the north transept are a number of fragments of interest—crosses, grave covers and carved details of many periods. There are five monumental effigies. One is that of Prior Leschman (1480-91), vested in the habit of his order. Two others are of knights habited in mail. The other two are of a civilian and a lady.

The Roman camp at Hexham will also be inspected, and should time permit the party will visit Limestone Bank to see the deep cuttings through the basalt of the ditches of wall and vallum. Fine views are obtainable from this point, including a considerable portion of the valley of the North Tyne, with the well-preserved typical border pile of Chipchase Castle, with its seventeenth-century additions, nestling in the valley. In ascending Limestone Bank the lines of the wall in the fields on the right hand and those of the vallum on the left are seen. This long stretch of the wall is many courses high; in it are the remains of a turret, the best preserved in the whole line, known as Blackcarts Turret.

After luncheon the party will drive to Chesters, the residence of Mrs. Clayton (additions by Mr. R. Norman Shaw), returning to Edinburgh the same evening.

Mr. William M. Page, 16, Rutland Square, Edinburgh, is the hon. syllabus and excursion secretary.

Correspondence.

The Henry Angel Memorial.

To the Editor of THE BUILDERS' JOURNAL.

CITY OF LONDON COLLEGE.

SIR,—You are doubtless aware of Mr. Angel's almost tragic death, from a paralytic stroke, in February last, while in the active discharge of his duties. As one of his earliest pupils, and a late colleague of many years' standing, may I enlist your sympathy and active support in founding a prize or scholarship to his memory at the City of London College? For many years Mr. Angel taught steam, applied mechanics, and practical plane and solid geometry with signal success both here and elsewhere. In spite of natural infirmities, he was ever most accessible as a teacher, and would put himself to an endless amount of trouble in order to help his students to master difficult problems. By such unceasing labours he gained the high esteem and love of all with whom he came in contact. Of him it may be truly said, he was a grand teacher and a thorough gentleman. Subscriptions to any amount will be thankfully received and acknowledged by Mr. P. J. Gillbard, hon. secretary of the Henry Angel Memorial Fund, City of London College, White Street, E.C.—Yours truly, ISAAC S. SCARF.

Examination Questions in Building Construction.

To the Editor of THE BUILDERS' JOURNAL.

BLUNDELL SANDS.

SIR,—On p. 348 of your last issue I noticed a letter from a correspondent signing himself "S. E. D." who admits that he has not seen the examination papers on the above subject, and yet considers them "fair." As a student I beg to differ from him, for there is not the slightest doubt that the papers set were extremely unfair and quite outside the requirements of the South Kensington authorities, especially the paper in the elementary stage, which only a student with an exceptionally smart intellect could have possibly done in the four hours allowed. Undoubtedly the science of building is progressing, but the elementary principles—*i.e.*, the principles set forth in the various text-books—do to a large extent remain the same, so that if the examiners, when setting the papers, have been keeping pace with the times, it is fairly obvious that an injustice has been done to students generally.—Yours truly,

R. M. WAUGH.

New Patents.

These patents are open to opposition until July 15th.

1900.—Ornamental Tiles.—8,612. J. WHITEHEAD, 42, Anglesea Street, Lozells; and W. ULBRICH, 99, Vyse Street; both of Birmingham. Imitation jewels, glasses or paste stones are used to heighten the brilliancy of the design.

Blocks for Caissons, &c.—8,831. G. L. MOUCHEL, 124, Holborn, London. According to this invention the blocks are constructed hollow, and consist of a comparatively thin shell of concrete rammed in between a strengthening metal framework. The latter is self-supporting without the concrete, but not necessarily so under the load which the finished block is designed to carry.

Stair Treads.—10,595. C. H. WILKINSON, Barlborough Place, Milnsbridge, near Huddersfield. The tread consists of lead, leather or india-rubber in which steel wires are embedded to afford a foothold.

Door Fastenings.—11,378. J. A. WADE, 19, Old Hall Street, Liverpool. This invention relates to the automatic bolting and unbolting of a pair of folding doors. By means of a sliding bolt and a toggle lever the opening of one door automatically withdraws the bolt of the other, and *vice versâ.*

The following specifications were published on Saturday last, and are open to opposition until July 22nd. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1900.—9,088, PLAISSETTY, incandescent gas lighting. 9,318, SMITH, closet seats. 9,492, DOUGLAS, ceiling-roses. 9,601, SEEFELS, fire-resisting and ventilated floors, ceilings, &c. 10,486, WURM, bolt fastenings. 11,303, JOHNSON, ventilators. 11,705, KAY, flooring cramp. 11,942, FENLON, geysers. 12,262, MERRYWEATHER & HARRIS, pumps. 12,513, LAKE (*Wachtel & Co.*), manufacture of artificial sandstone. 12,663, BRISTOW, method of transporting timber. 12,864, GOLDING, construction of walls and partitions. 12,945, BUTLER, paper hangings. 13,257, HARRASS, manufacture of veneers. 13,259, HILL, mantles for incandescent lighting. 13,278, RANSOME, concrete walls and structures. 13,279, RANSOME, concrete constructions. 13,544, RANSOME, concrete floors. 14,385, WOOD, combined snow-sweeper, water-cart and rail-groove cleaning appliance for tramways. 16,832, HARVEY, stair-rod eyes. 17,265, STRODE & CLARK, exhaust from an engine for heating purposes. 18,602, NELSON, smut-catchers for gas brackets. 19,923, FRÖHLICH, steam-heating apparatus. 20,948, PARKER, manufacture of coated wire. 23,612, OCHWAT, shaft furnace for the destruction of refuse.

1901.—772, GOEHST, wood floors. 1,758, LAKE (*Betts*), refining lead. 4,316, KESSLER, hardening plaster and other porous substances, and for fixing colours on them. 4,716, LE DUC, Venetian blinds. 5,748, PAGE (*Universal Metal Lath and Patent Co.*), expanded metal for lathing. 6,341, THOMPSON (*Verinigte Maschinenfabrik Augsburg und Maschinenbaugesellschaft Nürnberg A.-G.*), construction of foundations. 7,308, NEWTON (*New Jersey Wire-Cloth Co.*), fireproof floors, ceilings, &c. 7,494, HERBERLE, ball crushing-mills. 7,561, STORP, tiles, plates, slabs, &c. 7,706, PALMER, channel connection for conveying water from waste pipes to the drain trap. 7,901, LAKE (*Knight*), sash-balances for windows. 7,904, LAKE (*Knight*), sash-balances for windows. 7,908, LAKE (*Knight*), racks for the sash-balances of windows.

SOUTH KENSINGTON EXAMINATIONS.

QUESTIONS AND ANSWERS IN BUILDING CONSTRUCTION.—Elementary Stage.

[As so much attention has been directed to the recent examinations in building construction held at South Kensington, we have considered it of interest to publish answers to the questions set. The advanced and honours papers will be dealt with in separate articles to be published as soon as possible. It should be noted that the accompanying illustrations are not reproduced to the scale required, being only intended to indicate what is expected of the candidate. Four hours were allowed for the elementary paper given below. It was permitted to answer only seven questions.]

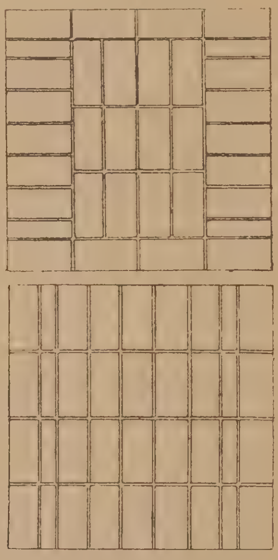
1. *Why is a brick made so that its breadth is less than half its length? Can you explain any advantage in "perforating" bricks? What are gauged arches?*

a. The length should equal two breadths + a mortar joint.

b. They dry quicker in backs, burn better, hold better in the wall, are lighter for size (an advantage in handling), cut more easily for closures, and are sometimes found convenient as ventilating bricks.

c. Those built with bricks shaped to radiate accurately in accordance with the dimensions of the arch. The term is commonly restricted to the circumstances where bricks of the ordinary shape are cut and rubbed to radiate so as to show neat close joints.

2. *Draw, to the scale of $\frac{1}{16}$, the plans of two courses of a brick pillar in English bond: the pillar to be square in section, four bricks in the side. To what height could you safely build a pillar of this section, assuming the safe load on a course of bricks to be 8 tons per sq. ft. and taking the weight of a cubic ft. of brickwork at 120lb.—neglecting wind-pressure?*



SOLUTION TO QUESTION 2.

a. See accompanying illustrations.

(Either of these two plans will satisfy the question if the successive courses are turned through 90 degs.; or the two may be used in combination.)

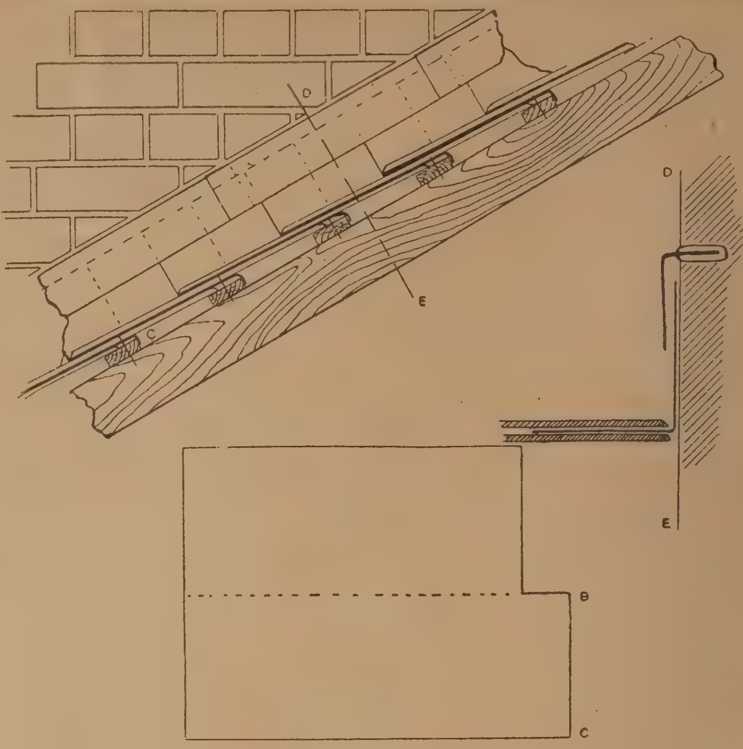
b. The height of such a pillar will be equal to the number of cub. ft. which will make 8 tons:

$$\frac{8 \times 2240}{120} = 149\tfrac{1}{3} \text{ ft.}$$

3. *What are—a skew arch; a skewback; a pillar; an abutment; a column; weathering of a window sill; weathering of stone; voussoirs; chamfer; plinth?*

a. When the plane of the spandrels or face of the arch cuts the centre line of the sheeting cylinder obliquely, particularly when the coursing of the sheeting is helical, so as to meet the face as nearly as possible at right angles.

b. The top of an abutment or pier ready for the first course of sheeting.



SOLUTION TO QUESTION 5.

c. Used loosely; heavier in proportion to height than a column (see column). Columns are frequently called pillars, as "Pompey's pillar."

d. Masonry carrying the springing of a single arch or of the end arch of a series.

e. Consists of base shaft and capital; base and capital may be rudimentary or may disappear.

f. The shape to which the top of a stone is dressed to give a fall for rainwater; particularly when it is so dressed to prevent water washing into the joints.

g. Scaling or wasting of stone in a building by the action of wetting, drying, frost, wind carrying sand, &c.

h. Stones properly dressed to fit in the sheeting of an arch.

i. The corner dressed off to replace the angle with two, more obtuse, angles.

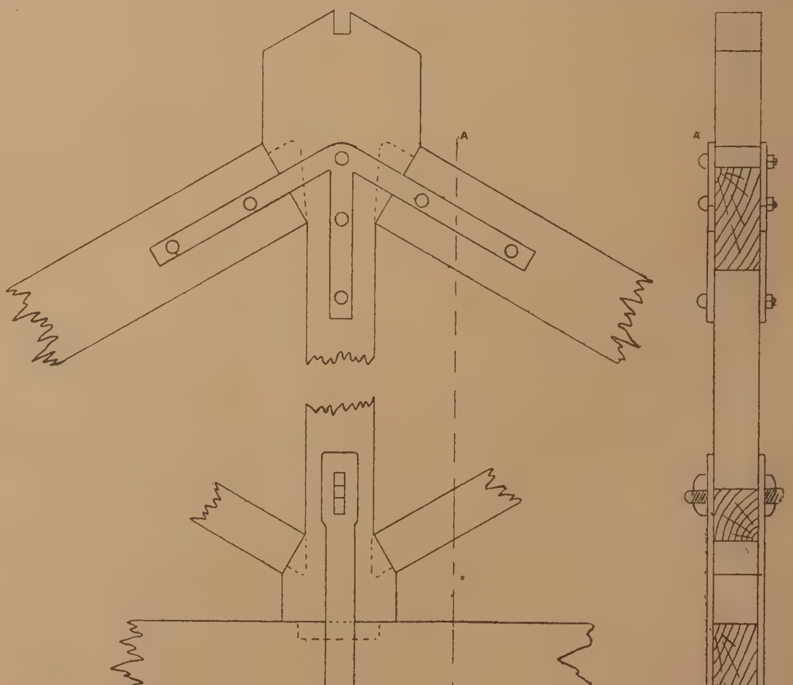
j. A projecting band just above ground level; a projecting band in any analagous position.

4. *A rubble wall with half-round concrete coping: draw it to the scale of $\frac{1}{16}$, showing the stones and mortar.*

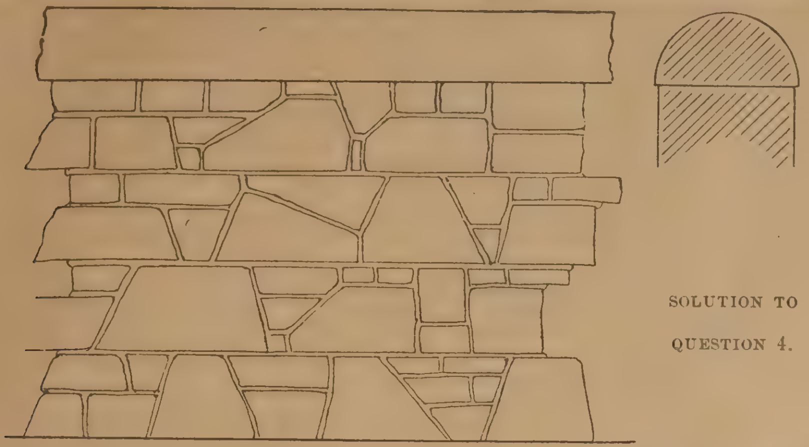
(See accompanying illustrations.)

5. *Show three soakers with cover flashing in position against a brick wall—slates 24in. long. Show clearly to the scale of ¼ all details, with such drawings and sketches, accompanied by explanations and dimensions, as you think sufficient.*

(The detail shows how soakers should be cut, without loss, so that there may be a projecting edge B C to be turned down over the top edge of



SOLUTION TO QUESTION 7.



SOLUTION TO QUESTION 4.

the batten at C; it need not be nailed. The drawing shows straight cover flashing. It is usual to step this, housing it in the joints of the brickwork, but if brickwork is in cement-mortar it will be found to be better to cover flash as shown.)

6. *Draw or sketch, to the scale of* $\frac{1}{4}$—(1) *A tenon and housed joint, mortised piece 4in. by 4in., tenoned piece 3in. by 4in.;* (2) *a tusk-tenoned joint, 9in. by 3in. timbers;* (3) *a dovetailed notch, timbers* $4\frac{1}{2}$*in. by 3in.*

(See accompanying illustrations.)

7. *Draw or sketch, to the scale of* $\frac{1}{8}$, *the top and bottom of a king post showing attachments of principal rafters and of the struts and tie-beam, and showing ironwork—rafters 8in. by 4in., shank of king post 6in. by 4in., struts 4in. by 4in., tie-beam 12in. by 4in.*

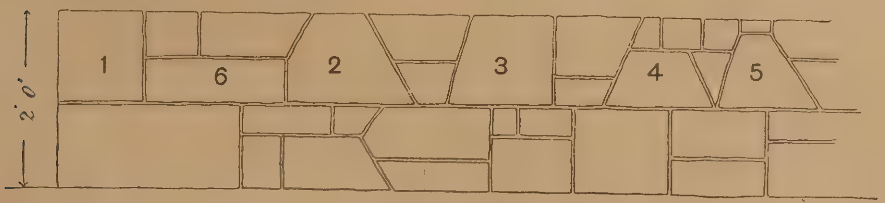
(See accompanying illustrations.)

8. *A skeleton drawing of an iron roof truss. The rafters are formed of* L *irons. Draw, to the scale of* $\frac{1}{2}$, *the joint at the apex. Repeat the diagram on your paper, and putting reference numbers to the different members, sketch cross-sections of them.*

(See accompanying illustrations.)

9. *Draw or sketch, to the scale of* $\frac{1}{4}$, *a cross-section showing bottom rail of sash, wood sill of window frame, stone sill, and window back; showing elbow. The window back is 2ft. high and the wall of the recess is 10in. thick.*

(See accompanying illustration.)



SOLUTION TO QUESTION 12.

10. *Draw or sketch, to the scale of* $\frac{1}{8}$, *cross-section of eave extending 4ft. up to the roof showing slates resting over a cut stone eave-course: the wall is 18in. thick, rafters 5in. deep, without roof trusses—ceiling joists at wall plates; slates 20in. long. Explain fully.*

(See accompanying illustration.)

11. *Draw, to the scale of* $\frac{1}{16}$, *the inside elevation of a ledged and braced door, and door frame; the door is 7ft. by 3ft. Show hinges, latch, stock lock; sketch cross-section showing jambs (wall* $1\frac{1}{2}$ *bricks thick).*

(See accompanying illustrations.)

12. *Two courses of masonry: how would you describe it? Sketch these two courses on your paper, and put reference numbers on the stones of the top course showing the order in which you think a mason would set them, giving reasons.*

a. Coursed rubble.

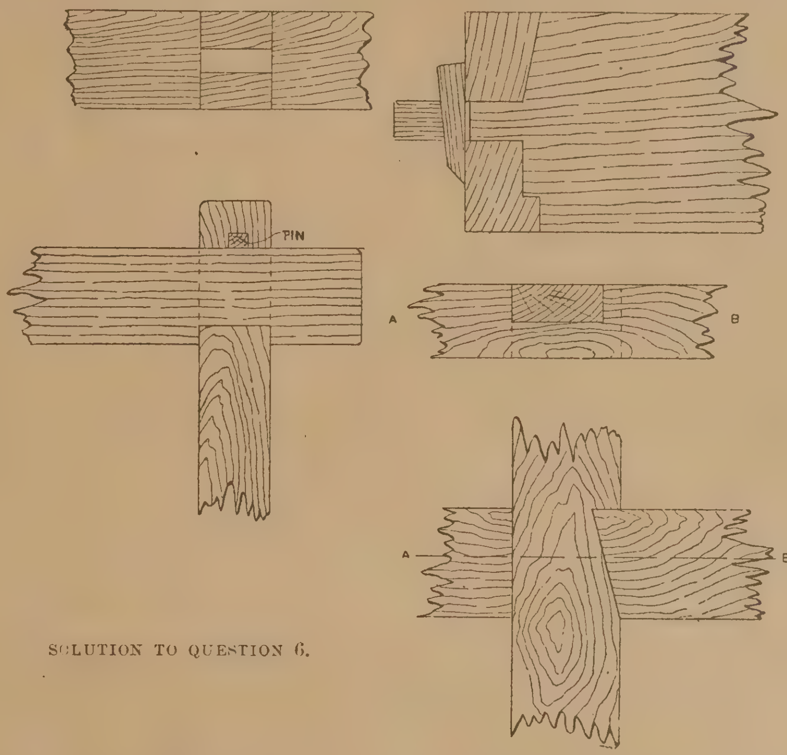
b. There is not a definite order; the stone marked 6 might be set before 3 or 4 or 5: the important rule to be observed by the mason is that he shall set his large well-bedded stones so as to cover the upright joints of the course below and to fill in between with closers. In the example shown the mason would put up his quoin No. 1 first and set his line from this stone. He would put up another good stone the height of the course at some other point, for his line, and he would set the large stones probably in the order numbered. He would not go further along than 5 till he had levelled up his course, because he does not go away from his mortar board and the supply of stones on his scaffold.

13. *Draw, to the scale of* $\frac{1}{8}$, *elevation of a double casement or French window 6ft. by 3ft. 6in.; draw cross-section of bottom bar of window and sill of frame; sketch hinges and fastening bolt. What is this kind of bolt called?*

(See accompanying illustrations.)

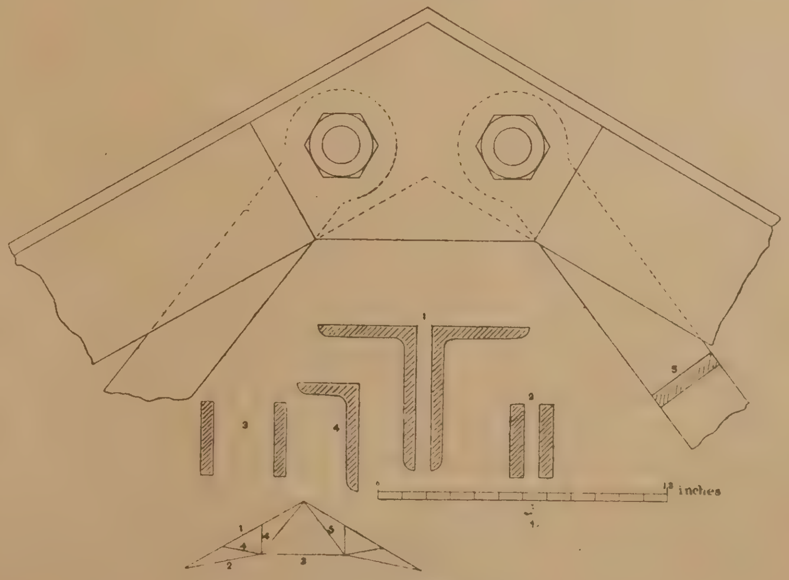
The question appears to ask for the name Espagnolette bolt, the common fastening for a French window.

14. *A floor of fir timber, joists lathed and plastered below to form ceiling of lower room. Draw plan, to the scale of* $\frac{1}{48}$, *showing by single lines complete joisting, figure scantlings. Draw, to the scale of* $\frac{1}{8}$, *cross-section through hearth reaching above camber-bar of fireplace. Show details of bearing of joists and of trimmer.*

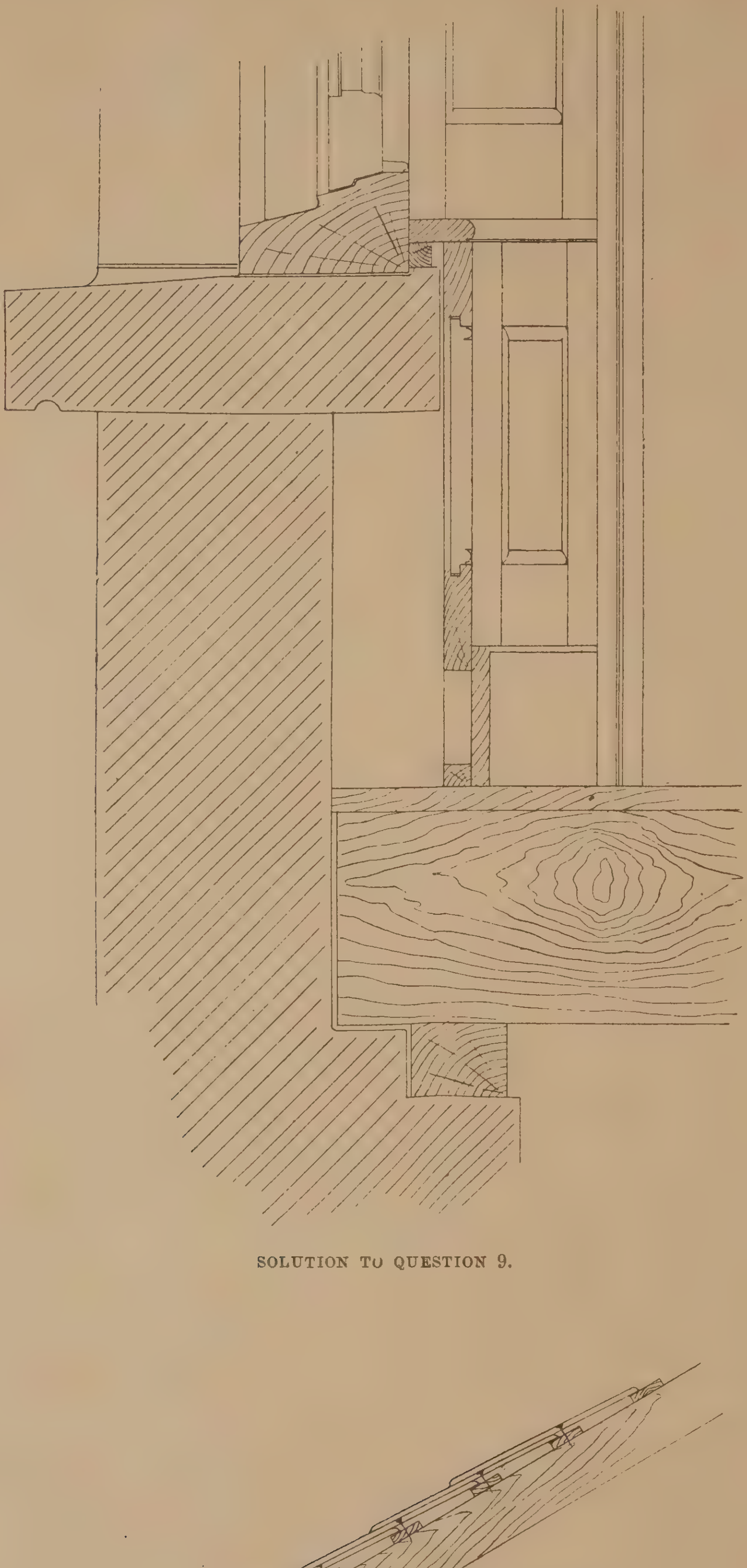


SOLUTION TO QUESTION 6.

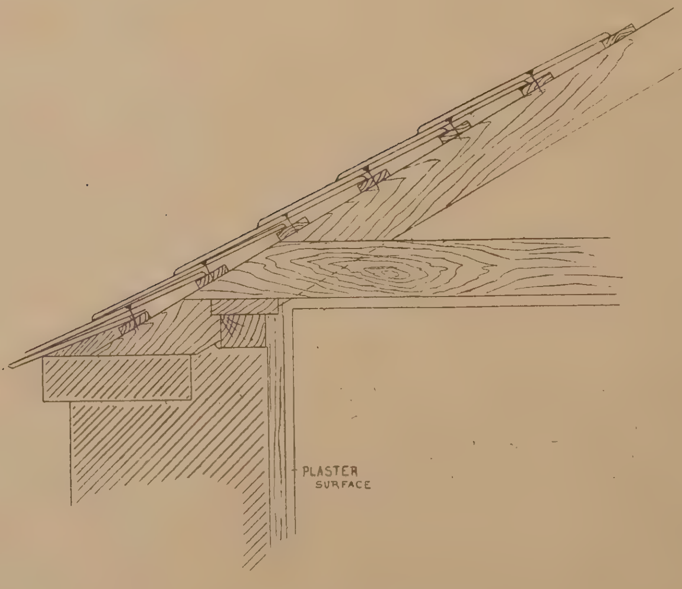
C, one row of herring-bone strutting, or there may be two rows with advantage. F, joist, 11in. by 2in.; A, trimming joist 11in. by 4ins; B, trimmer 11in. by 3in. or 11in. by 4in.; D, pieces 3in. by 2in. to carry oak margin to hearth; E, pieces 3in. by 2in. to carry flooring boards.



SOLUTION TO QUESTION 8.



SOLUTION TO QUESTION 9.



SOLUTION TO QUESTION 10.

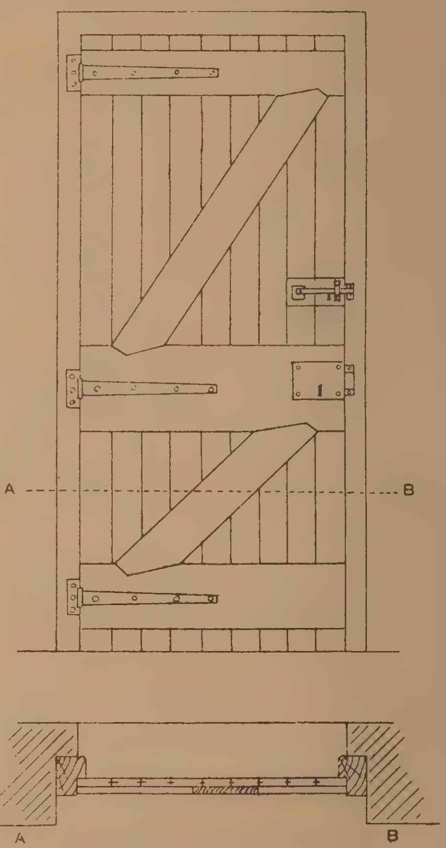
PROF. AITCHISON ON THE NEW GOVERNMENT OFFICES.

PROFESSOR AITCHISON writes to the "Times" as follows :—

It is most unfortunate that the two distinguished architects who were to build the new Government offices are both dead when the foundations alone have been completed ; and I daresay that no model of either of these great public monuments exists. I believe that all the principal buildings of the world, at least since Justinian's time, were built from models ; and by the precaution taken by the Pope to have a model made we have now Michelangelo's dome at St. Peter's.

For many of the buildings that have won the admiration of mankind two architects were employed, to ensure, I suppose, that the approved design might not be lost by the death of its designer. The Parthenon had Ictinus and Kallikrates for its architects. Anthemius, of Tralles, and Isidorus, of Miletus, were the architects of Sta. Sophia at Constantinople.

At St. Peter's Bramante was seconded by B. Peruzzi, and afterwards by Antonio da San Gallo the younger. Raffael had Giuliano da San Gallo and Fra Giocondo as aids, and after their deaths A. da San Gallo the younger was first architect ; he had Peruzzi as his second. There was no second architect to Michelangelo, although he had Vignola and Pirro Ligorio as aids.



SOLUTION TO QUESTION 11.

We were lucky in the strength and long life of Wren, who finished our great Protestant Cathedral, and in Sir Charles Barry, who finished the Houses of Parliament ; but Elmes, the architect to that triumph of classic architecture, St. George's Hall at Liverpool, died before it was finished, though he was fortunate in having so great a master as Professor Cockrell to finish it.

But should the proper completion of great public monuments be left to chance? The French Government, I am given to understand, always appoint a first and second architect to all their public buildings, the second being fit to carry out the first architect's design in case of his death.

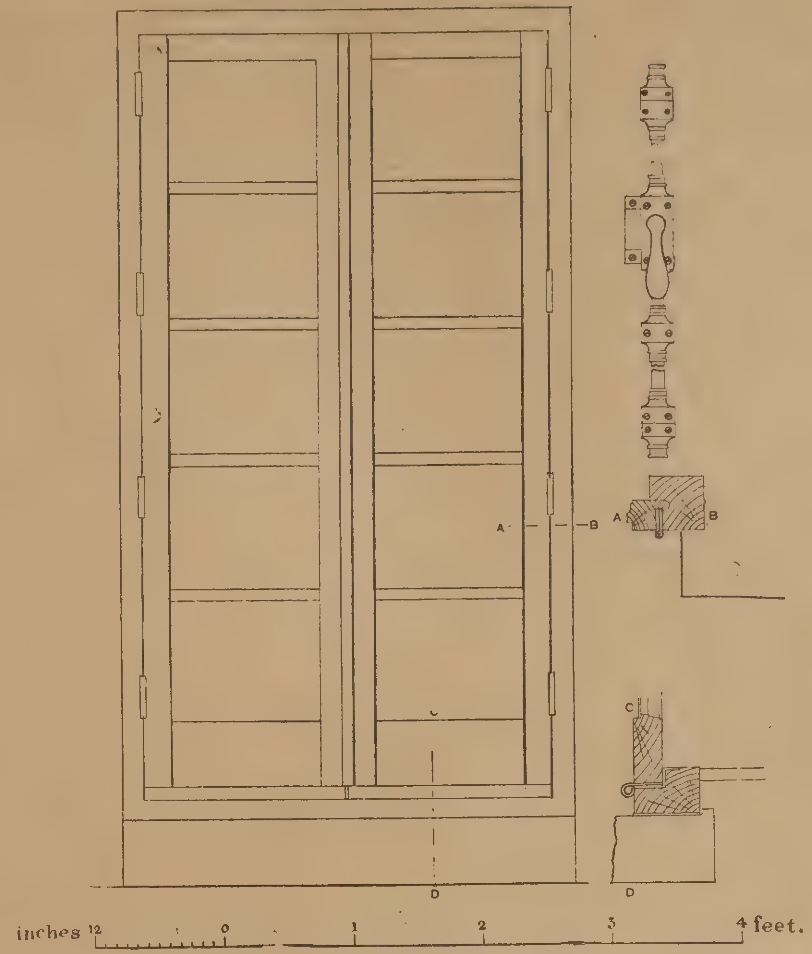
I am afraid the English people are not aware that architecture is the record of the artistic skill of each epoch and tells the state of cultivation of the nation from which all else may be deduced, or else they would not be so regardless of the possible fate that a monument may meet with in case of the death of the original designer —that is, they do not care if a bad history of their time is handed down to posterity.

NEW THEATRE AT ST. HELENS.

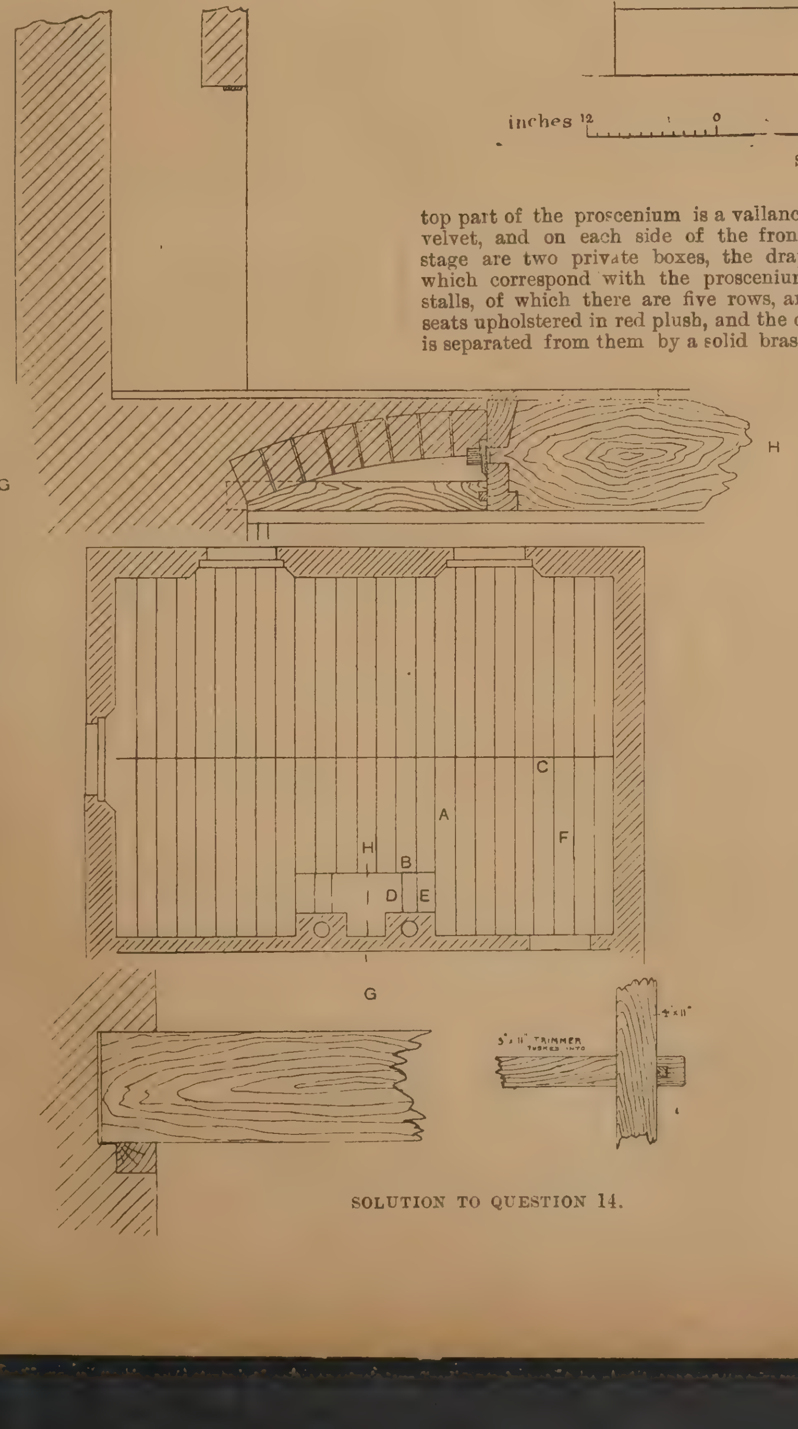
THE New Theatre Royal, in Corporation Street, was opened recently. The old theatre was unfortunately burnt to the ground on October 13th, 1899. Mr. Frank Matcham, the architect of the original building, prepared the designs for the rebuilding. Mr. Matcham, while retaining the old lines of the St. Helens theatre, has made several important alterations both in the construction and the arrangements. These include extra retiring rooms for ladies and gentlemen, and an increase of the seating accommodation, which may now be reckoned at something over 2,000. The dress circle is seated for 106, the orchestra stalls for 95, the upper circle for about 300, the pit stalls for 200, the pit for 500, the amphitheatre for 200, and the gallery for 600. The dress circle and the upper circle have been brought forward from the old position, so as to give more accommodation, and the gallery has also been brought forward about 4ft. 6in. The prevailing colour of the decorations is pale terra-cotta enriched with cream and gold lines, and the general design is in the style of the Louis XIV. and XV. periods. In the centre of the ceiling is a fluted dome, carrying Stott's patent ventilator and sunlight. Around the dome are four panel groups of figures painted in the Bartolozzi style and representing music, literature, sculpture and science. The proscenium has a rich frame of cream and gold. In the centre, immediately over the curtain, is the borough coat-of-arms. Running up the sides are columns of marble. The act-drop is from the brush of Mr. W. T. Hemsley. Underneath the top part of the proscenium is a vallance of red velvet, and on each side of the front of the stage are two private boxes, the draperies of which correspond with the proscenium. The stalls, of which there are five rows, are tip-up seats upholstered in red plush, and the orchestra is separated from them by a solid brass rail, on which are hung curtains of the same colour as those which adorn the boxes. Behind the orchestra stalls are the pit stalls, and beyond these again the pit. The whole of the walls of the pit are tiled up to 5ft., the remaining part being covered with a red paper. The chairs in the dress circle are upholstered with similar material to that used for draping the other parts of the house. At each end of the dress circle there is an alcove, in which hangs a framed mirror, heart-shape. The upper circle is immediately behind the dress circle, and it is upholstered in red plush; the floors are covered with thick cork carpet; the walls are hung with red flock paper, the ceiling being decorated with lincrusta. On the tier above the dress circle is the amphitheatre, upholstered in strong American cloth, and beyond is a spacious gallery from which a wide stone staircase runs down to the street.

Another improvement in the building is the installation of the electric light. Both before and behind the curtain this is to be the sole illuminant. From the central ceiling hang eight sprays of three lamps each, and at the side two sprays of five lamps each, while sprays of three lamps each are spread in front of the galleries and over the boxes. Altogether there are over ninety electric lights in the auditorium. To reduce the danger of fire to a minimum, the structure of the auditorium is built of concrete and iron, and all staircases and passages are fireproof. The heating of the building is effected by hot water pipes, and hydrants, fully equipped, are provided in the most desirable positions. A fireproof curtain completely divides the stage from the auditorium, and the whole of the timber of the stage has been covered in asbestos paint. The doors are fitted with Briggs's patent panic bolts.

The stage is a large and well equipped one. A feature of the arrangements here is that all the lighting will be electric, even for the footlights. By an ingenious arrangement on the principle of liquid resistance the footlights can be raised or lowered, so as to brighten or darken the stage. Above the stage are five adjustable rows of electric lights for the illumination of the stage. In these red, white and blue lights alternate, and the different colours can be used for stage



SOLUTION TO QUESTION 13.



SOLUTION TO QUESTION 14.

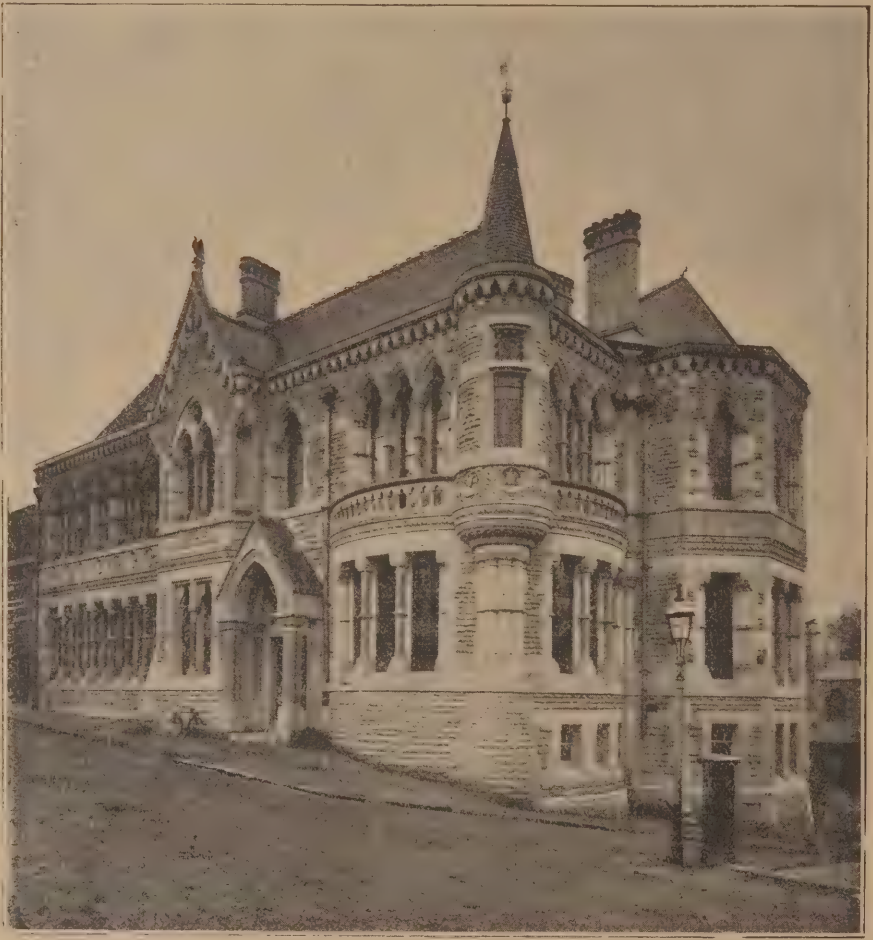
effects of sunrise and sunset, &c. A complete set of dressing rooms, lit by electric light, carpeted, warmed, and fitted with mirrors and all conveniences, has been constructed for the artistes.

The contractor for the building was Mr. P. Tickle, St. Helens. The fibrous plaster and decorations have been carried out on an independent contract by the well-known firm of De Jong; and the stalls and dress circle seating are by Messrs. Lazarus.

A New Public Park at Vale of Leven is being made. The enclosing fence is to be supplied by A. & J. Main & Co., Ltd., Clydesdale Ironworks, Possilpark, Glasgow. The laying out of the grounds is to be in the hands of Mr. Neil Leitch, Rothesay. A lodge or superintendent's house is to be erected at the south-east corner of the park; the style is to be Baronial, from the plans supplied by Mr. Millar, Glasgow, the architect of the Glasgow Exhibition.

SCHOOL OF SCIENCE AND ART, STROUD.

THE School of Science and Art illustrated on this page and the next has lately been erected at Stroud at a cost, including the site, of about £10,000. Mr. John P. Seddon, F.R.I.B.A., of London, and Mr. W. H. C. Fisher, of Stroud, were the joint architects. The upper floor is used for the art school, and provides an elementary room 35ft. 6in. by 20ft., an antique room 36ft. 6in. by 20ft., two painting rooms 27ft. 6in. by 20ft. and about 29ft. by 22ft., a modelling room 20ft. by 20ft., a small library and an art-master's room. The windows of the antique and painting rooms have a northern aspect, and are of the full height of the rooms, namely, 16ft. and 12ft. by 10ft. wide respectively. Opaque blinds are so arranged that the light is under complete control, or, if necessary, can be entirely excluded. The ground floor and basement are devoted to the museum and school of science. On the ground floor is the museum, lecture room, a classroom, physical laboratory and science master's room; and in the basement are the chemical laboratory and balance-room, with accommodation for a custodian. The site slopes so rapidly from the front (south) towards the north that although a height of 14ft. is given to the laboratory its floor is still above the external surface at the rear. A heating chamber is constructed beneath the basement landing, the building being heated by hot-water pipes and radiators; but the rooms are also provided with the usual open fireplaces. The fume closets in the lecture-room and chemical laboratory are connected by a flue beneath the floor of the latter with the smoke flue from the boiler, a small pilot fire creating the required draft at such times when the boiler may not be in use. Provision is made for ventilation by means of special air flues from each room, communicating with an air trunk in the roof, which in its turn is connected with the air shaft surrounding the smoke flue from the boiler. The work is executed in local freestone from the inferior oolite, the face being polled, with dressings of Box Ground stone from the superior oolite. The window jambs are finely moulded, the shafts of the mullions being of Bristol pennant, as are also those at the entrance porch. It is interesting to note that Mr. Seddon's appointment to this building was through a doctor of Stroud who was a friend and fellow-traveller of Viollet-le-Duc.



SCHOOL OF SCIENCE AND ART, STROUD. JOHN P. SEDDON, F.R.I.B.A., AND W. H. C. FISHER, Joint Architects.

The Competition for a School at New Brompton in Richmond Road for the Gillingham and Grange U.D. School Board has been decided in favour of Mr. J. D. Pearson, of 27, Chancery Lane, W.C., who has been appointed to carry out the work. Messrs. Newton, Son & Lawson, of Morcambe, won second place; Messrs. Greenhalgh & Brockbank, of Broad Street House, E.C., won third place; and Mr. F. M. Kirby, of Greenhithe, was fourth.

The Programme of the R.I.B.A. Visit to Glasgow is as follows: Thursday, October 3rd, R.I.B.A. dinner. Friday, (1) Lunch in the Exhibition grounds given by the Glasgow Institute of Architects; (2) Visit to the Glasgow University (tea); (3) Conversazione given by the Corporation of Glasgow; Saturday, Visits to Exhibition, &c. At all Friday's functions the presence of ladies will be welcome. Application for tickets should be made to the secretary R.I.B.A., 9, Conduit Street, W., if possible, before July 1st.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Answering R.I.B.A. Examination Questions.

CARLISLE.—BORDER writes: "Owing to the short time allowed for some subjects in the R.I.B.A. Intermediate Examination, would it be better to say a little on each question, or take up most of the time with one?"

It is best to answer as many of the questions set as possible, writing each one clearly and concisely, and not giving too much time to any single answer. Each question is allotted a certain number of marks. A sufficient aggregate cannot therefore be obtained by answering one question only. P. R. S.

Church Halls.

LONDON, S.W.—J. S. writes: "I have a client who is desirous of erecting a church hall in a small town, and therefore anxious to see some existing up-to-date buildings of this class. Could you give me any names of halls and their situations?"

The Vestry Hall, St. Mark's, Battersea Rise, by the late Mr. William White, and the Parish Hall, Holy Trinity, Upper Tooting, are both well-planned examples and of recent date.

P. R. S.

Boundary of Building Plots.

CORBRIDGE-ON-TYNE.—J. A. H. L. writes: "I have a piece of land that I wish to build upon. There is a thorn hedge, the centre of which forms my boundary. I understand that in some cases it is contended that the boundary is 3ft. beyond the centre. Is this so?"

Under ordinary conditions, the ditches constitute the actual boundaries of a piece of ground, and it is a well-worn land-surveying phrase that "the hedge carries the ditch." In other words the ditch—together with the adjacent bank or hedge—belongs to the field which is situated on the *opposite* side of the hedge to that on which the ditch is dug, and the true boundary of the property is that edge of the ditch which is furthest removed from the bank or hedge. Whilst the foregoing explanation represents the general principle as to average hedge-row boundaries, no hard-and-fast rule can be given, as very much depends on local or private circumstances, especially in the case of old enclosures. When a property adjoins a highway, it sometimes happens that the wayside ditch has been cut by the local authority entirely for road-drainage purposes, so that only an intimate knowledge of the particular road and property could definitely determine the actual boundary. If there is a ditch on both sides of the hedge, then—in the absence of other evidence—it may usually be assumed that the centre of the hedge forms the property boundary. Similarly, if there is no ditch on either side, it is generally understood that the centre of the hedge indicates the actual boundary. When making a survey of agricultural land, instead of the surveyor attempting to trace the line or edge of the various ditches (which are not always easily defined), it is usual in many districts to make an allowance of six links (or 4ft. approximately) from the centre of the hedge to the outer edge of the ditch as representing the field boundary. In other localities an allowance of 3ft. is given, but such approximations, whilst being convenient, do not necessarily indicate the true boundaries. It may be mentioned that in the Ordnance Survey (which was originally undertaken chiefly for military purposes) the measurements are taken to the centre of the hedge, bank or fence, as the case may be, so that these maps indicate the position of the physical divisions between the different enclosures, and not the actual property boundaries.

T. E. C.

Free Library Fittings.

Newport, Mon.—Pupil writes: "Could you give me some idea as to what fittings are necessary in a filing room for newspapers, &c., in a free library?"

"Library Construction," by F. J. Burgoyne (George Allen, 6s. nett), will give you full particulars and most useful advice upon the planning and construction of libraries.

Testing Cement Briquettes.

Newcastle.—M. W. writes: "How many lbs. per square inch is a fair test for cement after a seven days' immersion in water; and is there any special care required in moulding the briquettes for testing? Can you use too much water, and does the cement need to be pressed into the moulds? The cement is to be used for floors."

400lbs. per sq. in. at the age of seven days is a fair test for Portland cement. Too much water weakens a cement. In gauging briquettes for testing purposes the water should be only sufficient to rise to the surface when smoothed over with the trowel. The best results are obtained when the water rises to the surface of the briquette on ramming and shaking. The briquettes should not be pressed.

London, S.E.—T. S. writes:—"Are there any books on cement-work and testing? Have any articles on the subject appeared in your columns?"

"Portland Cement: Its Manufacture, Testing and Use," by D. B. Butler (Spon, 15s.), and "Lime, Mortar and Cement" (Sanitary Publishing Company) are good books. An article on Portland cement appeared in our issue for March 14th, 1900.

Panels in Glass Doors.

Wisbech.—Novice writes: "The accompanying rough sketch (not reproduced) shows a central diagonal panel in the upper half of a glass door. Kindly explain in your columns the proper method of jointing-up. I am recommended to use wood pulp for pugging wood partitions, &c. What is this material and its cost, and where can I obtain it?"

The bars of the diamond-shaped centre are mitred, and morticed at the mitres. the other bars being tenoned into them. We do not consider, however, that such a design should be used at all; it is weak, expensive and not suited to wood construction (which should be as simple and straight as possible). Adopt either a single pane of glass, straight bars across or perpendicular, or, if the pane is too large and does not look well, use leaded lights. We have not heard before of wood pulp being used for pugging, but presume the ordinary kind as made by paper manufacturers would be employed. We would not, however, advise its use; it would probably rot and, if subjected to damp, would be attacked with fungus growth; it would also harbour vermin. Slag wool is by far the best, being sound-, fire- and vermin-proof.

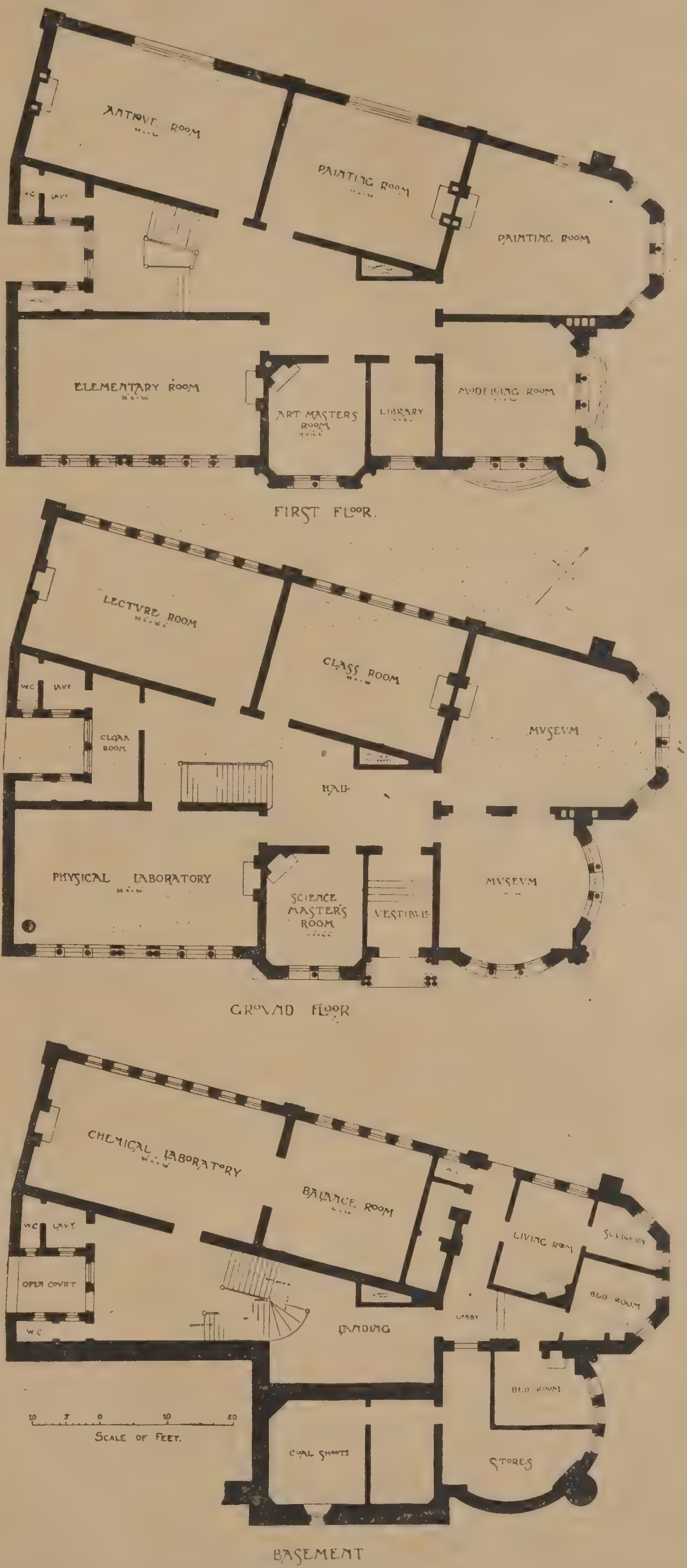
Calculating Weight of Timber Beams.

Montacute.—An Enquirer writes: "On p. 308 of your issue for May 22nd, in reply to 'Formula,' you state that 'w = breaking weight in cwts.' In 'Strength of Materials and Structures,' by Sir John Anderson, one reads (p. 180): 'Breaking weight in lbs. =

$$\frac{\text{breadth in ins.} \times \text{depth squared in ins.} \times \text{constant},}{\text{length in feet.}}$$

Does w = breaking weight in lbs. or in cwts?"

The formula is ultimately dependent on the values assigned to the constant c. Sir John Anderson adopts values for the constant 112 greater than Hurst's, thus making it equivalent to reducing the cwts. calculated by Hurst to lbs. by multiplying by 112. Thus Hurst adopts 3 as the constant for elm, while Anderson uses 337. The two formulas are, therefore, both correct each with their separate constants.



SCHOOL OF SCIENCE AND ART, STROUD. JOHN P. SEDDON, F.R.I.B.A., AND W. H. C. FISHER, Joint Architects.

Nuisance Inspectors' Reports.

CREDITON.—J. E. B. writes: "Does the report of a nuisance inspector written in his journal constitute a written application (or complaint) under section 41 of the Public Health Act, 1875?"

Section 41 of the Public Health Act, 1875, states that "on the written application of any person to a local authority, stating that any drain, water-closet, earth-closet, privy, ash-pit, or cesspool on or belonging to any premises within their district is a nuisance or injurious to health (but not otherwise) the local authority may, by writing, empower their surveyor or inspector of nuisances, after twenty-four hours' written notice, to enter such premises, with or without assistants, and cause the ground to be opened, and examine such drain, water-closet, earth-closet, privy, ash-pit, or cesspool. If the drain, water-closet, earth-closet, privy, ash-pit, or cesspool on examination is found to be in proper condition, he shall cause the ground to be closed, and any damage done to be made good as soon as can be, and the expense of the work shall be defrayed by the local authority. If the drain, water-closet, earth-closet, privy, ash-pit, or cesspool on examination appear to be in bad condition, or to require alteration or amendment, the local authority shall forthwith cause notice in writing to be given to the owner or occupier of the premises, requiring him forthwith, or within a reasonable time therein specified, to do the necessary works.". As an expression of opinion, it is considered that the report of a nuisance inspector written in his journal would not constitute a written application as required by the Act. Under ordinary circumstances, the complainant or occupier should make the written application. T. E. C.

Right of Council to erect Mortuary.

AN OLD SUBSCRIBER writes: "May an urban district council, which, acting as a burial board, has recently purchased land for a cemetery with moneys borrowed on the security of the poor rates, now erect a public mortuary on a convenient small piece of land, and defray the expense out of the general district rates?"

Under the Public Health Act the local authority has power to provide a mortuary. Hence the urban district council are within their right. A. O. H.

Theoretical Mechanics.

GRAYS.—R. J. T. writes: "Kindly name a book dealing with the cardinal principle and theory of construction, which will enable me to solve the following questions set at the last S. K. Honours Examination in Building Construction: What is meant by saying that the height to which a pyramid of any building material may be raised is three times the height of a column of uniform section? Show how, by attending to a cardinal principle of construction, you can build a tower of brick or stone of very great height. With reference to the previous question, a brick tower of efficient design is built on a square base 60ft. by 60ft.; it is 500ft. high. Allowing six tons per sq. ft. as the *safe* load on a cross section, and taking 120lbs. as the weight of a cub. ft. of brickwork, what is the area of the top? What weight in tons may be safely placed on the top?

The principle referred to is the same as that for foundations, &c., namely, that of distributing the pressure over a larger area of ground; the stress by good bonding being deflected over a large enough bearing to resist crushing or shear. The volume of a cylinder (or cylindrical column) = area of base × perpendicular height, whereas the volume of a pyramid = area of base × $\frac{1}{3}$ perpendicular height. It can be seen therefore that the pyramid can be raised to three times the height of the column for the same weight of material that will cause crushing. The area of the top of the tower is calculated from the formula for the frustum of a pyramid, namely, if a = area of one end, a^1 = area of other end, and h = height of frustum. Volume $= (a + a^1 + \sqrt{a . a^1}) \times \frac{1}{3}h$. The ordinary text-books will enable you to solve these questions, but the book dealing most theoretically with them is Rankine's "Manual of Applied Mechanics" (Griffin & Co., 12s. 6d.). The questions and answers set in the above examination will be published shortly in our columns.

Builders' Notes.

Mr. Joseph Shaw, joiner and builder, of Douglas Terrace, Holmfirth, died recently at the age of sixty-six years.

Mr. G. E. Wallis, builder, of 215, Boxley Road, Maidstone, died recently. He was head of the well-known firm of Messrs. G. E. Wallis & Sons, builders, of Maidstone, and alderman of the Maidstone Council.

Valuable Deposits of Jasper, of a deep-red colour, have been struck at Careg-y-Plas, in the parish of Aberdaron, South Carnarvon. The lodes are said to be from 10yds. to 40yds. in width, and practically exhaustless. A demand for the stone is anticipated for memorials to the late Queen. It can be cut in blocks tons in weight.

Mr. Joseph Harry Bradley, builder, of Barnsbury, died recently at the age of thirty-six years. Mr. Bradley was born in Islington, educated at the High School in Barnsbury Street, apprenticed to Dove Brothers, and, in time, passed all the necessary examinations in building construction, sanitary science, &c., and became a master.

Paying Wages in Public-houses.—At the Kilmarnock Sheriff Court last week Thomas Young, joiner and contractor, Carment Drive, Stevenston, was charged with a contravention of the Payment of Wages in Public-Houses Prohibition Act by having, on 30th March, within a public-house at Ardeer Ironworks Square, Kilmarnock, paid wages to three of his workmen. He pleaded guilty. It was stated in extenuation that the offence was a very technical one. On the date in question there had been a severe snowstorm, and the men stopped work at ten o'clock. Learning that Mr. Young and his foreman were in the public-house, they went there and asked for their wages, as they wished to go home to Irvine, and the foreman gave them the money to save them walking to the office. The sheriff said that as this was the first prosecution under the Act in Ayrshire, or perhaps in Scotland for anything he knew, he would not inflict any penalty, but he warned accused to be more careful in future.

Keystones.

A New Church of St. Colombo at Middlesbrough is being erected in Cannon Street at an estimated cost of about £7,000.

A New Public Hall at Port Ellen is being erected in Gothic style. The architects are Messrs. Sydney Mitchell & Wilson, of Edinburgh.

Tetbury Church is to be restored. Mr. Jenkins's tender for raising the floors of the chancel and the choir preparatory to the erection of choir stalls in the latter have been accepted. Already over £820 is being spent on the work.

A New Works at Willesden, N.W., has been erected for the Standard Soap and Perfumery Co., Ltd., an American firm who manufacture the "Royal Standard" soap. The builders were Messrs. Collins & Cook, who also provided the plans.

New Members of the R.I.B.A. have been elected as follows: As Fellows—Messrs. J. C. Hall, London; H. B. Measures, London; E. H. Pritchett, Swindon; and N. Y. Armstrong Wales, of Dunedin, New Zealand. As Associate—Mr. J. A. Minty, Leyton. As Honorary Corresponding Member — M. Sainte-Marie Perrin, of Lyons.

The Church of St. Mary, Washfield, about three miles from Tiverton, has just been extensively restored. The tower of the church has been re-pointed, a new parapet erected on top, a new roof put in, and the base of the tower has also been repaired; the five bells have also been recast and re-hung, whilst a new tenor has been added. The latter weighs 10½ cwt. The cost of the masonry work was £250, and that of re-hanging and casting the bells £250, and £15 for extras, making a total of £515.

A New Cottage Hospital has been erected at Blairgowrie.

A New Fire Station at Tonbridge is being erected in the Castle Ground with an entrance from Bank Street, from designs by Mr. W. L. Bradley, C.E., the town surveyor.

Royal Society of British Artists.—The following have been elected members of this society: E. W. Davies, H. Chadburn, J. E. Goodall, J. H. Borglum, Shirley Fox, J. D. Fergusson, John W. Allison and Carton Moore Park.

A Stained-Glass Window at St. Mary's Church, Chard, the fourth of a series, has just been erected in the north aisle. The window contains three single figures, in the centre St. Mary B.V., and on either side SS. Mary Magdalen and Mary, wife of Cleophas, and is from the studios of F. Drake & Sons, of The Close, Exeter.

A New Infirmary and Nurses' Home at Richmond is being erected by the local guardians at a cost of £40,000, and will contain accommodation for eighty-one males and eighty-one females. A special feature of the building, the site of which is close to Richmond Park, will be the provision which is made for the open-air treatment of consumption.

A New Church of St. Peter, at Rugby, has been erected of corrugated iron upon brick foundations, with red brick pillars, by Messrs. Hollowell & Son. The interior has been matchboarded, and in the nave the walls are tinted green, whilst the chancel is painted white. The edifice provides accommodation for 300 worshippers. The total cost of the building has been about £800.

M. Ernest de Sarzec, the French archæologist died recently. Born in 1836, he was Vice-Consul at Massowah from 1872 to 1875, and afterwards at Basra. Encouraged by M. Waddington, Minister of Foreign Affairs, and by the Louvre Curators, he carried on excavations, with his wife's assistance, at Tello, which threw much light on Chaldean history and enriched the Louvre with a valuable collection.

A New Foresters' Hall at Cranswick has been erected by the village club at a cost of between £800 and £900. The hall measures 70ft. by 29ft., and kitchen accommodation, a gallery and ticket offices are also provided. The front is of Accrington red bricks, with stone dressings, and a deep panelled frieze of stone runs across it. The architect was Mr. Joseph Shepherdson, and the contractor Mr. John Dunn, both of Driffield.

Archæological Discoveries in Turkestan.—Dr. Stein, writing from Khotan on April 22nd, reports the latest results of his excavations in Northern Chinese Turkestan. He has unearthed a large number of fine stucco sculptures closely resembling the Greco-Buddhist relics of the North-Western Punjab, probably belonging to the first century of the Christian era. Great difficulty is being experienced in excavating the colossal Buddhas, but valuable photographs have been taken of them, while the smaller pieces have been removed. Dr. Stein has now a fine illustration of what the big Stupa with its chapel and court was like in Khotan at the time of the Han dynasty.

Liverpool Cathedral: Recommendation to adopt St. James's Mount Site.—Important decisions were arrived at by the Lord Bishop's Cathedral Committee on June 3rd. It was resolved: "That this committee, having carefully considered the various suggested sites for the erection of a cathedral, recommend the Lord Bishop of Liverpool to adopt the site of St. James's Mount; further, that they have pleasure in placing at his lordship's disposal, for the erection of the cathedral, promised contributions amounting to £125,000." A vote of thanks was passed to Mr. T. Shelmerdine, the city surveyor, for the valuable assistance he had rendered. The committee and the council of University College, feeling that the interests of both the cathedral scheme and the university for Liverpool scheme would be best served by a mutual arrangement that one should take precedence over the other in appealing to the public, have agreed that a public meeting on behalf of the building of a cathedral should be held on June 17th, and that a meeting to further the proposed university should be held not earlier than October next.

Sir Thomas Drew, R.H,A., P.R.I.A.I., has been presented with a gilt silver cup and cover by the members of the Royal Institute of Architects of Ireland as a mark of esteem on his receiving the honour of knighthood.

The Nonconformist Grammar School at Bishop's Stortford has had new Science buildings added at a cost of £1,500. Messrs. J. L. Glasscock & Son were the builders. The materials used are red bricks and yellow stone dressings, and the building contains physical and chemical laboratories and lecture-room, each 30ft. by 20ft., also a preparation-room, stores, &c.

New Casual Wards for the Holborn Guardians are to be erected on the site of the old Holborn workhouse in the Gray's Inn Road, at a cost of £11,000, from competitive plans by Messrs. Smith & Coggins. The three other architects who had entered into competition and submitted plans were Mr. L. H. Isaacs, Mr. Lewis Solomon and Mr. Saxon Snell, who were respectively awarded £25, £15 and £10.

Working-Class Flats at Great Yarmouth have been erected on Kitchener Road, by the Corporation, under the Housing of the Working Classes Act. There are eight flats, each of two rooms, in the block, and the rental is half-a-crown per week for each tenement. The building is of red bricks, divided in the centre by a stone stairway with glazed white-tiled walls which conducts to a sort of balcony on the first floor, whence entrance is obtained to the upper tenements. At the back of the building is a concreted yard with offices. The rooms provided are moderate in size, but one of each couple is fitted with a cooking range. It is only intended that two persons shall live in each flat.

Herr Josef Engel, the sculptor, died recently at Buda-Pesth, aged eighty-six. The deceased artist, who was patronised by Queen Victoria and Prince Albert, studied at Pressburg and at Vienna, where, in 1837, he obtained a first prize for a statue of Apollo. He then went to Paris, and finally to London. Some of the standard bearers on the facade of the Houses of Parliament were modelled by him, as well as the statue of King John. It was not, however, till his busts of the Queen and Prince Consort attracted attention that more important commissions were given to him, including that for his "Battle of the Amazons." In 1846 the Queen sent him to Rome, where he executed the "Battle of the Amazons" on a larger scale; and this group is now at Osborne. After his return to England he received commissions for groups and statues from the Prince of Wales, the Lord Mayor and others; and his fame reaching his native country, he returned, in 1866, to finish the Tszechenyi Monument and a number of busts and statues.

Sir Martin Conway has been appointed Slade Professor of Fine Art at Cambridge. He is an enthusiastic explorer and mountaineer, and was formerly Art Professor at Liverpool University.

The Artist-Decorators of Paris have founded a society for the purpose of defending their interests and for organising exhibitions of every class of decorative art. Already there are 250 members, and the society hopes that amateurs and the public will aid it in its endeavour to raise the standard of decoration and to imbue the people with an appreciation of the value of art in their homes.

The Alexandra Hospital, Woodhall Spa, has been extended by the addition of a new ward at a cost of £2,000, and will provide for ten more beds. The new wing is situated on the south side of the hospital. It consists of a large day-room for the men. The roof of the men's sleeping-room has been raised, and the size has been increased. One additional bed has been added in this portion of the hospital, and the new ward which has been added will provide four beds. On the first floor two small wards have been converted into one. The alterations were carried out under the supervision of Mr. Temple Moore, architect; and the builders were Messrs. Sherwin & Son, of Boston.

A New Drill Hall at Grimsby is to be erected for the 3rd Battalion of Lincolnshire Rifle Volunteers at an estimated cost of £3,000. The architect is Mr. F. W. Croft. The site is situated on the west side of Doughty Road, and contains 1,384 sq. yds. The ground floor will comprise two spacious entrances from Doughty Road, giving access to drill hall from either end, and sufficiently wide to enable the men to march out fours deep; also orderly room, ladies' and gentlemen's cloak-rooms, heating vault, kitchen, scullery, stores, magazines, armoury, covered rifle range and sergeant's house. The drill hall floor has an area of 116ft. by 55ft. 6in., and the height is 32ft. From the drill hall is entered the rifle range, which is 104ft. long by 10ft. wide, and abuts on Peppercorn Road. The first floor comprises officers', sergeants' and men's mess-rooms, and band practice room, and a balcony is arranged around three sides of drill hall. The sergeant's house is arranged on the north corner of site, fronting Peppercorn Road, and comprises on the ground floor sitting-room, kitchen, scullery, and out-offices, and on the first-floor three bedrooms. The floor of drill hall is to be laid with oak battens on redwood joists, resting on india-rubber cushions, and the walls are to have a dado of cement, 5ft. high, prepared for painting, but the intervening brickwork between dado and roof is to be left rough for distempering. The main front of building faces Doughty Road, and is designed in the Tudor style, faced with best stock bricks and Ancaster stone dressings, roofs to be covered with Port Dinorwic slates.

Mr. W. J. Hopkins, F.R.I.B.A., of Sansome Lodge, Worcester, died recently at the age of eighty years. He was Diocesan Architect of Worcester.

A Board School Competition.—Six sets of plans were sent in recently in competition for the new school which the Loughborough School Board propose to erect in Rendell Street. The assessor, Mr. Evans, of Nottingham, has awarded the premium to Messrs. Barrowcliff & Allcock. This firm sent in two schemes, one of which was placed first and the other second. The plans show provision for a mixed school, an infant school, a cookery centre, pupil teachers' centre, also a separate room for defective children.

A New Public Library and Council Offices at Briton Ferry is being erected in Neath Road at a cost of £3,000. The ground floor will consist of a commodious reading-room and library, whilst the first floor will contain the council chamber offices for the clerk to the urban district council, the surveyor and the rate collector. The caretaker's house will adjoin the library. The architect is Mr. H. Alexander Clarke (surveyor to the Briton Ferry Council), and Mr. T. Walters, of Swansea and Briton Ferry, is the contractor.

COMING EVENTS.

Wednesday, June 12.

INSTITUTE OF SANITARY ENGINEERS.—Meeting at New Offices, 19, Bloomsbury Square, W.C., of General Purposes and Finance Committee at 4 p.m., and Half-Yearly General Meeting at 7 p.m.

Thursday, June 13.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

SOCIETY FOR THE ENCOURAGEMENT OF THE FINE ARTS.—Dr. Phené, V.P., F.S.A., on "Our Highly Refined Forefathers in Pre-Roman Britain."

Friday, June 14.

INSTITUTION OF ELECTRICAL ENGINEERS.—Conversazione at Natural History Museum, Cornwall Road, S.W., 9 to 12 p.m.

PHYSICAL SOCIETY.—Meeting at 5 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual Excursion to Roman Camp at Chesters and Hexham Abbey.

Saturday, June 15.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual Excursion to Durham Cathedral and Castle.

Monday, June 17.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Professor W. R. Lethaby on "Education in Building," 8 p.m.

Wednesday, June 19.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

Thursday, June 20.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

Saturday, June 22.

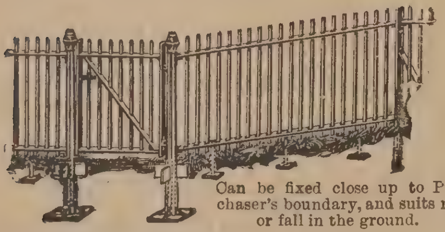
BRITISH INSTITUTE OF CERTIFIED CARPENTERS—Visit to Hampton Court Palace at 3 p.m.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
June 14	Exeter—Buildings	Town Council	D. Cameron, City Engineer and Surveyor, Exeter.
" 14	Llanfihangel-y-Creuddyn—New Turret	School Board	Rev. J. P. Evans, Vicarage, Llanfihangel-y-Creuddyn.
" 14	Tisbury—Wesleyan Chapel and Schools	——	E. Deweyn, High Street, Tisbury.
" 14	Bradford—Extension of Washing Shed	——	Milnes & France, 99 Swan Arcade, Bradford.
" 14	Celbridge, Ireland—Four Labourers' Cottages	Rural District Council	F. Shortt, Clerk, Council Offices, Celbridge.
" 14	Waterhouses, Durham—Alterations, &c. to Sewage Tank	Brandon Urban District Council	R. Gardner, Surveyor, Langley Moor.
" 14	Everereech—Completion of a House	C. M. Moody	Moody & Son, Evercreech.
" 14	Seven Sisters, Neath—Alterations of School	Dylais Higher School Board	J. C. Rees, Church Place Neath.
" 15	Bishop Auckland—Seven Shops and Offices, &c.	H. P. Tyler	F. H. Livesay, 107 Newgate Street, Bishop Auckland.
" 15	Edzell, Scotland—School	Edzell School Board	D. W. Galloway, 2 Market Street, Brechin,
" 15	Embleton, Cockermouth—Alterations, &c.	——	W. S. Davis, The Vicarage, Embleton.
" 15	Kingston-on-Thames—Offices and Workshops	Knapp, Drewett & Sons, Ltd.	W. H. Hope, Architect, Hampton Wick.
" 15	Lancaster—Conversion, &c.	Properties Committee	Borough Surveyor, Town Hall, Lancaster.
" 15	Llanrhaiadr-yn-Mochnant—Village Hall	Llanrhaiadr-yn-Mochnant P. Council	E. Bremner, Smith & Bremner, Oswestry.
" 15	Cheriton—School Extension	The School Managers	C. Vawser, Cheriton.
" 15	Southall, Middlesex—Repairs, &c.	Burial Board	Superintendent's Lodge, Southall Green.
" 15	Canterbury—Infants' School Buildings	Managers	W. J. Jennings, 4 St. Margaret's Street, Canterbury.
" 15	Christchurch—Nurses' Home at Workhouse	Union Guardians	A. Druitt, Clerk, Workhouse, Christchurch.
" 15	Glasgow—New General Hospital	Parish Council	J. Thomson & R. D. Sandilands, 241 West George Street, Glasgow.
" 15	Nottingham—Erection of Stone Gate Piers	Public Parks Committee	F. B. Lewis, City Architect, The Guildhall, Nottingham.
" 17	Leeds—Erection of Wooden Offices, &c.	The Market Committee	The City Engineer, Municipal Buildings, Leeds.
" 17	Workington—Erection of Eighteen Houses	Workington Urban Sanitary Authority	Borough Surveyor, Workington.
" 17	Porth—Erection of Two Shops and Offices	J. Preece	E. Jones, Architect, Porth.
" 17	Wenlock—Reservoirs, Cottages, &c.	Madeley & Broseley Joint Water Committee	Municipal Offices, Ironbridge, Shropshire.
" 17	Worksop—Infirmary Buildings	Guardians	H. C. Scaping, Court Chambers, Grimsby.
" 17	Silsden, Yorks—Police Station	West Riding County Council	West Riding Court House, Keighley.
" 17	Sutton, near Dublin—Water Tank	Great Northern Railway Co.	Engineer-in-Chief, Amiens Street Terminus, Dublin.
" 18	Rotherham—Brick Tank	Gasworks Committee	Engineer, Gas Works, Rotherham.
" 18	Edmonton, N.—Chimney Shaft, &c.	Union Guardians	T. E. Knightley, 106 Cannon Street, E.C.
" 18	London, E.C.—Alterations to Underground Convenics.	Corporation	Engineer to the Corporation, Guildhall, E.C.
" 19	London, N.—Renovation of Methodist Chapel	——	W. Knight, 1 Langdon Road, Upper Holloway, N.
" 19	Marsh Green, Dagenham—Mixed School	Dagenham School Board	Harrington & Ley, 65 Bishopsgate Street Without, E.C.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING—*cont.*:		
June	19	Dublin—Dwellings	Rural District Council	J. O'Neill, Clerk. Board Room, North Brunswick Street, Dublin.
„	19	Fishguard, Pembroke—House, &c.	Pembroke Estate Co., Ltd.	Jenkinson & White, 1 Princess Street, Westminster, S.W.
„	20	Deal—Depôt Buildings	Urban District Council	T. C. Golder, 23 Queen Street, Deal.
„	20	Barrow-on-Soar, Leics—School	Governors	Barrowcliff & Allcock, Mill Street, Loughborough.
„	20	Tycam, Cwmrheidol—Footbridge over Rheidol	———	Aberffrwd Chapel House.
„	21	Winchester—Alteratns. & Additns. to Public-houses, &c.	Messrs. Welsh & Co.	T. Stopher, 57 High Street, Winchester.
„	25	Walthamstow—School Buildings	School Board	G. E. T. Laurence, 22 Buckingham Street, Adelphi, W.C.
„	25	Abingdon—Wing at Roysses School	———	J. G. T. West, The Knowl, Abingdon.
„	25	Great Yarmouth—Additions	Electric Lighting Committee	J. W. Cockrill, Town Hall, Great Yarmouth.
		ENGINEERING:		
June	14	Peterborough—Extension of Plant	Corporation	J. C. Gill, Municipal Offices, Peterborough.
„	14	Okehampton, Devon—Boiler, &c.	Guardians	Master at the Workhouse, Okehampton.
„	14	Stafford—Permanent Way of Sidings	Siemens Brothers & Co., Ltd	Siemens Brothers & Co., Ltd., Woolwich, Kent.
„	15	Newcastle-upon-Tyne, Dredges, &c.	Tyne Improvement Commissioners	R. Urwin, Secretary. Bewick Street, Newcastle-upon-Tyne.
„	15	Buckingham—Engines, &c.	Urban District Council	J. Smith, Engineer & Surveyor to the Council, Buckingham.
„	15	Edinburgh—Ash-Conveying Plant	Magistrates and Council	Resident Engineer, Dewar Place, Edinburgh.
„	15	Perth—Wadeworks	County Council	Thomson & Wright, 22 Rutland Square, Edinburgh.
„	15	Bury, Lancs—Tank Locomotive	Gas Committee	H. Simmons, Engineer and Manager, Gasworks, Bury.
„	15	Sutton Coldfield—Meters, &c.	Corporation	T. V. Holbeche, Town Clerk, Sutton Coldfield.
„	17	Dublin—Tank	Great Northern Railway Co., Ireland	Engineer-in-Chief, Amiens Street Terminus, Dublin.
„	17	Much Wenlock—Waterworks	Joint Water Committee	Municipal Offices, Ironbridge, Shropshire.
„	18	London, S.W.—Steam, &c., Piping	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„	18	York—Widening Bridge	North Eastern Railway Company	W. J. Cudworth, Company's Engineer, York.
„	18	Rotherham—Gasholder	Gas Committee	Engineer, Gas Offices, Rotherham.
„	19	Padiham, Lancs—Weighing Machine	Urban District Council	J. Gregson, Surveyor, Padiham.
„	19	Hammersmith—Various Works	Borough Council	H. Mair, Borough Surveyor. Hammersmith.
„	19	Barking, Essex—Condensing Plant	Urban District Council	Engineer, Electricity Works, East Street, Barking.
„	20	Rotherham—Wiring	Corporation	E. Cross, Borough Electrical Engineer, Rotherham.
„	20	Nelson—Steam Mower	Markets and Parks Committee	B. Ball, Borough Engineer and Surveyor, Nelson.
„	22	Witham, Essex—Sinking Boring	Urban District Council	W. B. Blood, Clerk to Council, Witham.
„	22	Burnley—Waterworks	Rural District Council	E. Edmondson, 18 Nicholas Street, Burnley.
„	24	Copenhagen—Steam Ferry	———	Statsbanernes, Söfartsafdeling, Reventlowsgad, 16 Copenhagen B.
„	25	Cairo—Engines, &c.	———	Inspector-General of Irrigation, Upper Egypt, Cairo.
„	25	Bishop's Stortford—Repairs to Engines	Urban District Council	R. S. Scott, A.M.I.C.E., Bishop's Stortford.
„	30	Nelson, Lancs—Conveyor Belt	Sewage and Streets Committee	B. Ball, Borough Engineer and Surveyor, Nelson.
Aug.	1	Manila—Harbour	———	Commercial Department, Foreign Office, Manila.
Dec.	10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.
		IRON AND STEEL:		
June	14	Preston—Pipes	Corporation	T. Cookson, Town Hall, Preston.
„	15	Nottingham—Steel Siphon Pipes	City Council	A. Brown, City Engineer, Guildhall, Nottingham.
„	15	Perth—Pipes, &c.	County Council	Thomson & Wright, 22 Rutland Square, Edinburgh.
„	15	Macclesfield—Cast Iron	Gas Committee	Engineer, Gasworks, Macclesfield.
„	16	Leeds—Railings	Corporate Property Committee	City Engineer's Office, Leeds.
„	17	Aberaman, near Aberdare—Car, Bolts, &c.	Steam Coal Co., Ltd.	Manager, Stores, Aberaman Offices, near Aberdare.
	18	London, E.C.—Rails, &c.	Southern Mahratta Railway Co., Ltd.	Company's Offices.
	18	Pontypridd—Ironwork	Gas Committee	E. Jones, Gas Offices, Treforest.
	18	Leeds—Entrances to Park	Corporation	City Engineer's Office, Municipal Buildings, Leeds.
„	26	Christiania—Wire	———	Inspector of Telegraphs. No. 8 Stenersgade, Christiania.
„	26	Manchester—Bolts and Nuts	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
July	1	Calcutta—Bins	Corporation	Chairman of Corporation, Calcutta.
„	31	Sydney, N.S.W.—Rails	———	Agent-General for N.S.W., 9 Victoria Street, Westminster, S.W.
		PAINTING AND PLUMBING:		
June	15	Macclesfield—Oils and Paints	Gas Committee	Engineer, Gasworks, Macclesfield.
„	18	Brighton—Painting	Guardians	H. S. Reed, Parochial Offices, Prince's Street, Brighton.
„	18	London, W.—Painting at Infirmary	Paddington Guardians	E. H. Sim, 8 Craig's Court, Charing Cross, W.C.
„	18	Preston—Painting, &c., Cattle Market	Corporation	Borough Surveyor, Town Hall, Preston.
„	18	London, S.W.—Painting, Varnishing, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
„	19	Leeds—Painting	Sewerage Committee	City Engineer's Office, Municipal Buildings, Leeds.
„	26	Manchester—Oils, Paints, &c.	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
Aug.	5	Cleckheaton—Interior Renovation of Church	———	Wesleyan Church, Whitcliffe Road, Cleckheaton.



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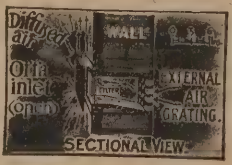

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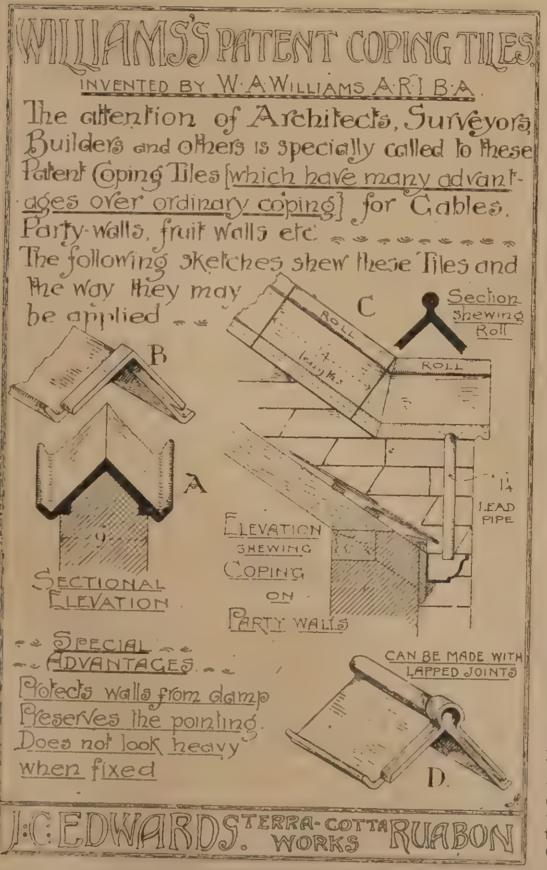
DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ROADS AND CARTAGE:		
June	14	Hull—Granite Setts	Corporation	A. E. White, City Engineer, Town Hall, Hull.
,,	15	Milford Haven—Limestone	Urban District Council	Chairman, Highway Committee, Milford Haven.
,,	15	Shotley Bridge—Paving	Benfieldside Urban District Council ..	J. Dixon, Surveyor, Shotley Bridge.
,,	16	Wimbledon—Dust Vans	Urban District Council	O. H. Cooper, Surveyor, The Broadway, Wimbledon.
,,	17	Wolverhampton—Forming, &c.	Streets Committee	Borough Engineer's Office, Town Hall, Wolverhampton.
,,	17	London, N.W.—Improvement Works	Hendon Urban District Council	S. S. Grimley, Engineer to the Council, Public Offices, Hendon, N.W
,,	17	Ham, Surrey—Materials, &c.	Urban District Council	W. Warner, Ham Common.
,,	17	Erith, Kent—Street Works	Urban District Council	Surveyor, High Street, Erith.
,,	17	London, W.—Vans	Paddington Borough Council	Town Hall, Harrow Road, W.
,,	18	Aldershot—Works, &c.	Urban District Council	N. F. Dennis, Council's Surveyor, Aldershot.
,,	19	Wimbledon—Making up	Urban District Council	Council Offices, The Broadway, Wimbledon.
,,	20	London, N.—Road Repairs	Metropolitan Asylums Board	Board Offices, Embankment, E.C.
,,	25	Shrewsbury—Concrete Flags	Improvement Committee	W. C. Eddowes, Borough Surveyor, The Square, Shrewsbury.
,,	25	Tantobie, Durham—Street Works	Urban District Council	R. Heslop, Surveyor, Burnsfield, R.S.O.
,,	25	Amble—Widening, &c.	Urban District Council	W. Gibson, Surveyor, Amble.
,,	26	Dartford, Kent—Paving, &c.	Urban District Council	W. Harston, Surveyor, High Street, Dartford.
		SANITARY:		
June	17	Barrow-on-Soar, Leics.—Sewge. & Sewge. Disposal Wks.	Rural District Council	E. and F. W. Hodson, Engineers, Loughborough Offices.
,,	17	Aberaman, near Aberdare—Lime and Cement	Powell Duffryn Steam Coal Co., Ltd. ..	Stores Manager, Aberaman Offices, near Aberdare.
,,	19	Bexley Heath, Kent—Sewers, &c.	Urban District Council	W. J. Lomax, 15, Fold Street, Bolton.
,,	21	Sutton Coldfield—Sewers, &c.	Corporation	W. A. H. Clarey, Engineer & Surveyor, Town Hall, Sutton Coldfield.
,,	22	Alford, Lincs—Sewers, &c.	Urban District Council	F. Massie, Tetley House, Wakefield.
,,	24	Ongar, Essex—Drainage	Rural District Council	W. N. Jarvis, Surveyor, Council House, Ongar.
,,	24	West End, near Southampton—Drainage Work ..	Guardians	W. H. Mitchell, Son & Gutteridge, 9, Portland Street, Southampton.
,,	25	Strathaven, Scotland—Sewage Works	District Committee	W. L. Douglass, 3 Clydesdale Street, Hamilton.
,,	26	Manchester—Lime	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
		TIMBER:		
June	15	Trimdon Grange, Durham—Timber	Messrs. W. Scott, Ltd.	Storekeeper, Trimdon Grange Colliery, Trimdon.
,,	17	Aberaman, near Aberdare—Timber	Powell Duffryn Steam Coal Co., Ltd. ..	Stores Manager, Aberaman Offices, near Aberdare.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
June	24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100	W. H. Talbot, Town Clerk, Town Hall, Manchester.
,,	24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
,,	30	Hereford—Municipal Buildings	£100, £75, £50	J. Carless, Offa Street, Hereford.
July	31	Manchester—Fire Station and Police Station ..	£300, £200 and £100	W. H. Talbot, Town Hall, Manchester.
Aug.	1	Egremont, Cumbrld.—Alteration of Property in Main St.	——	J. Lowery, 59, Main Street, Egremont.

IMPROVED COPING TILE
(PATENTED)
For GABLES, PARTY WALLS, &c.


WILLIAMS'S PATENT COPING TILES
INVENTED BY W·A·WILLIAMS A·R·I·B·A
The attention of Architects, Surveyors, Builders and others is specially called to these Patent Coping Tiles [which have many advantages over ordinary coping] for Gables, Party-walls, fruit walls etc
The following sketches shew these Tiles and the way they may be applied
C
ROLL
ROLL
Section shewing Roll
B
A
1¼ LEAD PIPE
Elevation shewing Coping on Party walls
Sectional Elevation
Special Advantages.
Protects walls from damp
Preserves the pointing.
Does not look heavy when fixed
CAN BE MADE WITH LAPPED JOINTS
D.
J. C. EDWARDS. TERRA-COTTA WORKS RUABON

This Coping prevents the water collected by it from running down and soaking into the wall beneath.

The end tile is provided with outlets, from which the water can be conducted to the eaves gutter or elsewhere by a small lead pipe, or the outlet holes can be omitted, the tile throated and set to let the water shoot clear of the building, but the pipe is recommended and the expense is trifling.

It can be used as well on the flat, as raking, for with a little care it can always be laid to a slight fall, the outlets then should not be more than 10 feet apart.

The Tiles are set and jointed in cement, the edges being scratched up rough to form a key, making a permanent and water-tight joint.

It will be seen that with these Copings the walls are protected from dampness, pointing preserved, rooms in roof kept dry, and defective flashings and fillets do not cause so much leakage. No other ordinary Coping answers the same purpose.

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Hold the Largest Stock of
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STOCK.

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SPECIAL PRICES,
and advise an early inspection.

New Companies.

Austrian Timber Syndicate, Ltd.

Registered May 23rd to carry on the business of timber merchants and brokers, to acquire the agency and selling rights of various timber merchants and sawmill proprietors in Austria-Hungary and for the sale of their timber in the United Kingdom, the British Colonies, &c. Capital £5,000 in £1 shares. Registered office: Camomile Street Chambers, 36, Camomile Street, E.C.

The Scottish Central Carting Co., Ltd.

Registered in Scotland to acquire and carry on the business of carting contractors, &c., lately carried on at Leith by John L. Kerr, Ltd. Capital £6,000 in £1 shares (2,500 preference).

Triumph Stoker, Ltd.

Registered May 25th to take over the business of mechanical stoker manufacturers carried on by Ransomes & Rapire, Ltd., and to carry on the business of ironfounders, engineers, tool makers, &c. Capital £6,000 in £1 shares. The first directors are T. Lowden, H. Lowden and F. Selby (chairman). Registered office: 39, Victoria Street, S.W.

Shuffrey's, Ltd.

Registered May 25th to take over the business of a furnishing and builders' ironmonger, &c., carried on by F. B. Shuffrey, at 245-6, Stafford Street, 173, Wednesbury Road and 3, Digbeth; all in Walsall. Capital £6,000 in £1 shares.

George Armitage & Sons, Ltd.

Registered May 25th to acquire the business of quarryowners now carried on by J. Armitage, A. Armitage and G. Armitage, at Robinhood, near Wakefield, Yorkshire, as George Armitage & Sons, and to carry on the business of stone and brick merchants, stone quarry owners, brick, tile and pipe makers, manufacturers of all articles made of stone or brick, lime burners and cement makers. Capital £54,000 in £1 shares. Registered office: Robinhood, near Wakefield.

Ludwig Oppenheimer, Ltd.

Registered May 25th to acquire the business carried on at Blackburn Street, Old Trafford, Manchester, as Ludwig Oppenheimer, and to carry on the business of parqueterie and mosaic importers, merchants, manufacturers, and workers, brick and tile manufacturers and merchants, &c. Capital £5,000 in £1 shares. The first directors are L. J. Oppenheimer, Ludwig Oppenheimer, A. Oppenheimer, C. Oppenheimer and W. R. Oppenheimer.

Finspong Syndicate, Ltd.

Registered May 25th to acquire any part of the capital of the company known as the Aktiebolaget Finspongs Stybruck, a company formed under the laws of the kingdom of Sweden, and generally to carry on the businesses of forest owners, foresters, timber merchants, timber dealers, &c. Capital £150,000 in £1 shares.

Curzon Estate Co., Ltd.

Registered May 29th to purchase a plot of land at Hurst, near Ashton-under-Lyne, and prepare it for building purposes. Capital £5,000 in £1 shares.

Kirk & Co., Ltd.

Registered May 29th to acquire the business carried on at 11, Chesterfield Road, Sheffield, by Dora Kirk (trading as Kirk & Co.), and to carry on the business of painters, decorators, paperhangers, general merchants, ironmongers, &c. Capital £1,000 in £1 shares (200 preference). The first directors are F. W. Kirk (manager), H. Platten and J. L. Taaffe (secretary). Registered office: Victoria Chambers, 22, Norfolk Row, Sheffield.

Improved Pulveriser Syndicate, Ltd.

Registered May 29th to acquire certain letters patent or other protection relating to the pulverising of rock ores and other minerals, a rotary brick machine, a dry press-brick machine and other patents, the inventions of Thomas Parker; to acquire, treat and sell ores, bricks, tiles, marble, and other articles and substances. Capital £30,000 in £1 shares.

London and Westminster Property Co., Ltd.

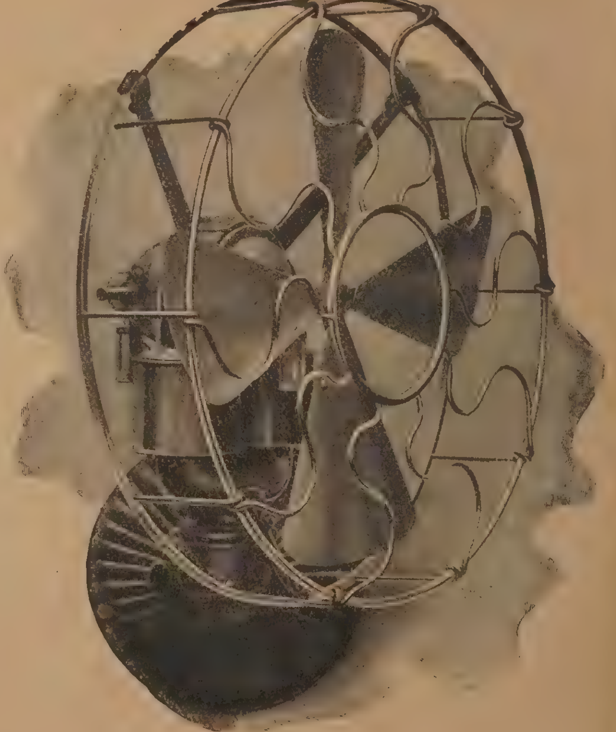
Registered May 31st. Capital £6,000 in £1 shares. The first directors are C. F. Fitch and C. E. Castellan. Registered office: 20 Bucklersbury, E.C.

Horsley, Smith & Co., Ltd.

Registered May 30th to acquire the business of timber merchants and sawmillers now carried on by Joseph H. Horsley and Alexander Smith, at the city of Kingston-upon-Hull, under the style or firm of Horsley, Smith & Co., and to carry on the business of timber merchants, sawmillers, creosote workers, lumbermen, &c. Capital £200,000 in £100 shares (400 preference). Joseph H. Horsley and Alexander Smith are governing directors. Registered office: Vernon Street, Queen's Dock, Hull.

Bourne, Drying and Ventilating Co., Ltd.

Registered May 31st, to adopt an agreement with the Bourne Engineering Co., Ltd., and to carry on the business of general and mechanical engineers, manufacturers of machinery, and appliances for drying, lighting, heating and ventilating. Capital £5,000 in £1 shares.



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Property and Land Sales.

In Chancery.—Re Charles Jack, deceased, Jack v. Jack.

The very valuable FREEHOLD ESTATE known as Beech Hill Park, in the parish of Enfield, in the county of Middlesex, almost adjoining Hadley Wood Station, on the main line of the Great Northern Railway, and only about a mile from the Market Town of Barnet. It is specially valuable, either as an important residential property or as an unequalled estate for the erection of first-class houses, and occupies a really grand position, in the heart of a lovely country, at an elevation of some 300 feet above sea level. It has a direct south aspect, is beautifully adorned with noble old timber, has frontages of about 6,500 feet to main road, is only 10 miles from London, and has direct access in about 30 minutes to King's Cross, also to Moorgate and Broad Street Stations. The property comprises a spacious family mansion surrounded by charming old time pleasure grounds, prolific kitchen garden, with vineries, peach-house, green and hot houses, &c. In an enclosed yard is the stabling for 10 horses, large coach-house, harness room, and three rooms for coachman. There is also a spacious Farm Homestead, neat entrance lodge, and gardener's cottage; and a dwelling-house, cottage, garden, and buildings let at £60 per annum. Well-timbered and undulating Park in which are sheets of Ornamental Water of about 8 acres. The intense quietude of the spot, the entire absence of footpaths and rights of way over the park, and the purity of the water, attract numbers of wild fowl to these pools, and it is a rare sight so near London to see, as one often does here, many hundreds of birds upon and over these waters, and no doubt the formation of a decoy would be not only highly interesting but very lucrative to an owner. Other game is fairly plentiful, and the positions of the several woods and plantations would enable a resident to keep up a good stock of pheasants. The whole property covers an area of about 261 acres 1 rood 26 poles, and, with the exception of the dwelling-house, &c. above-mentioned. Possession will be given on completion of purchase. Also a valuable enclosure of Freehold Building Land, with two cottages, of about 4 acres 0 roods 18 poles, having an important frontage to the main Barnet road, adjoining Hadley Common, and near to Hadley Wood Station; now ripe for immediate building operations.—Mr. EDWARD TEWSON of the firm of Messrs.

DEBENHAM, TEWSON, FARMER, and BRIDGEWATER (the Auctioneer appointed by the Judge to whose Court this cause is attached), will SELL by AUCTION at the Mart, on THURSDAY, JULY 25, at 2, the above-mentioned very important FREEHOLD PROPERTIES.

Particulars of Messrs. SAXTON and MORGAN, Solicitors, 29, Somerset Street, Portman Square; of Messrs. SURMAN and QUEKETT, Solicitors, 35, Lincoln's Inn Fields; of Mr. A. Kingwell, Estate Agent, 103 and 104, Cheapside; and of the Auctioneer, 80, Cheapside.

By Order of Mortgagees.

Birchington-on-Sea, Kent. Valuable Freehold Building Estate of 70 acres, known as The BIRCHINGTON BAY ESTATE, facing the sea, with extensive frontages to a splendid sea wall promenade, well-made roads, and public gardens. Ripe for immediate development. The Public Hall with stage and handsome billiard saloon will be included in the Sale. The Estate has been well developed, large sums have been expended in the construction of the sea wall and roads, which are well designed and give a high-class tone to the property. All the houses are of a good class. A good drainage system has been constructed, and no expense has been spared to ensure a profitable development of the scheme. The Estate is within easy reach of the station, two miles of Westgate-on-Sea, three from Margate, and 70 from London.

MESSRS. HARMAN BROS., of 25, Ironmonger Lane, Cheapside, E.C., will, in conjunction with Mr. E. HOLSWORTH, SELL the above at the Mart, Tokenhouse Yard, E.C., in one lot, on MONDAY, JULY 1st, at 2 o'clock.

Particulars, with plans and conditions of sale, may be had of Messrs. YOUNG and SONS, Solicitors, 29, Mark Lane, E.C.; of Mr. E. Holsworth, 80, High Street, Stoke Newington, N.; and of the Auctioneers, 25, Ironmonger Lane, E.C.

Edgware (7½ miles from Marble Arch), within five minutes of station on G.N.R., one mile from Stanmore Station, L. & N. W. Ry.—39 Plots of valuable Freehold Building Land, on the Mead's Estate, extensive frontages to Mead's Road. Well made and sewered and admirably adapted for the erection of small dwellings for working men. Gas and water supplies laid on. Also seven Freehold Cottages, Nos. 2, 4, 6, 8, 10, 11, and 12, Mead's Road. All let to reliable weekly tenants, and producing a gross rental of £138 10s. Free conveyances. Purchase money payable by instalments.

MR. WALTER HALL will SELL the above by AUCTION, at the Railway Hotel, Edgware, on Thursday, June 13, at 7 in the evening. Particulars, Plans, &c., at the Railway Hotel; of Messrs. Camp & Ellis, Solicitors, 40, High Street, Watford; and of the Auctioneers, 38, Chancery Lane.

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THE BEST & STRONGEST BELT FOR DRIVING IN HEAT, STEAM, DAMP, WATER, OR OUT OF DOORS.
A Contractor writes:—"I shall be glad to recommend it as superior to any other Belting I have in use."
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QUANTITIES, Etc.,
Type-written, Cheaply, Well, and Promptly.
Type-Writers for Sale, or Hire.
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PARTNERSHIP wanted in a provincial builder's or timber merchant's business. Capital available £500 to £1,000.—X. Y. Z., BUILDERS' JOURNAL Office.

R.I.B.A. EXAMS. PREPARATION, personally or by correspondence, in three, six, nine, or twelve months' courses. Architectural Lending Library. Special three months' finishing courses.—For full particulars apply to Messrs. HOWGATE & BOND, Associates R.I.B.A., 115, Gower Street, W.C. (close to the British Museum).

R.I.B.A., Society of Architects, Surveyors' Institute (Building Section), and Civil Service Technical Examinations. Preparation by correspondence or in residence.—MIDDLETON & CARDEN, 19, Craven Street, Strand, W.C.

SHOP FITTINGS.—Several Ground Glass Mahogany Window Frames for SALE cheap.—Apply 13, Berkeley Street, Piccadilly.

APPOINTMENTS VACANT.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two.

REQUIRED, JUNIOR DRAUGHTSMAN, with Sanitary Engineering experience for making Working Drawings.—Apply by letter, stating age and experience, to DOULTON & CO., Limited, Lambeth, S.E.

WANTED, CLERK OF WORKS, for a large Hotel in Cheshire.—Apply by letter to W. EDWARDS, Architect, Wolverhampton.

WANTED—OFFICE BOY in ARCHITECT'S OFFICE. Good handwriting indispensable, and knowledge of tracing desirable.—Apply F.T.B., 50, Berners Street, W.

PAINTER.—Wanted a LEADING HAND. Must be a good colourist, and accustomed to management of men. Constant if suitable.—Apply H. T. B., 57, Rosebery Road, Clapham Park, S.W.

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ARCHITECT'S ASSISTANT requires ENGAGEMENT; plans from rough sketches, details, specifications, and assistance with quantities.—Apply "C," c/o Frank H. Shayler, Esq., Architect, Oswestry.

ARCHITECT'S ASSISTANT requires ENGAGEMENT. Good draughtsman, colourist, tracer, &c. Quantities, specifications, &c.; varied experience in building trades; excellent references; moderate salary.—R. Bradford, Sir Lewis Street, King's Lynn.

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT. Three years' articles just expired. Good reference. Neat tracer, colourist, and good printer.—W. LEWIS, Thornham, King's Lynn Norfolk.

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QUANTITY SURVEYORS and ARCHITECTS.—ASSISTANCE RENDERED in Taking-off, &c., by the hour or on commission.—References given.—H. R. A., 22, Ellison Road, Streatham Common.

GENERAL, or WORKING FOREMAN of BRICKLAYERS, disengaged. Well up in plans, good manager of men.—W., 147, South Esk Road, Forest Gate, E.

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Manager— JOHN B. THORP, *Architect and Surveyor.*

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ALVASTON (DERBY).—For the completion of Warren Street, Southwood Street, and part of Baker Street, for the Alvaston and Boulton Urban District Council. Mr. Charles Greatorex, surveyor :—

J. Holmes, Clay Cross	£1,615 10 8
C. E. Cox & Son, Ilkeston	1,187 14 6
J. Tomlinson, Derby	1,181 18 3
S. Richmond, New Lenton, Nottingham	1,167 0 0
G. F. Tomlinson,* Derby	1,023 10 0

* Accepted.

BRIGHTON.—For alterations and additions at No. 48 Dyke Road, for Messrs. Beckwith. Mr. W. C. F. Gillam, M.S.A., architect, Central Chambers, 3 North Street, Quadrant, Brighton :—

Brown & Sons	£775	Penfold	£657
Field & Co.	774	Diplock	655
J. Barnes	765	Smart*	600
Saunders Bros.	659		

* Accepted.

BRIGHTON.—For alterations and additions at No. 5 Powis Road, for Mr. A. G. Sharman. Mr. W. C. F. Gillam, M.S.A., architect, Central Chambers, 3 North Street, Quadrant, Brighton :—

A. Smart	£235 0	Saunders Bros.	£207 0
S. H. Diplock	235 0	Lynn & Sons*	193 0
H. J. Penfold	207 0	Brown & Sons	192 12

* Accepted.

CARSHALTON.—For the making-up of Ringstead Road, for the Carshalton Urban District Council. Mr. William Willis Gale, A.M.I.C.E., surveyor :—

T. Free & Son, Maidenhead	£1,410 0 0
A. G. Soan, Streatham	1,401 18 7
H. Bentham & Co., Streatham	1,371 10 7
J. B. Potter, Sutton	1,350 0 0
Lawrence & Thacker, Clapham Common	1,271 13 7
W. Jenner,* Benhill Street, Sutton	1,056 0 2

* Accepted.

CHELSHAM.—For rebuilding the Bull Inn, Chelsham Common. Messrs. Chart, Son, & Reading, architects, Croydon :—

Worsfold & Son	£1,700	Bacon	£1,239
Cheeseman	1,300	Goulder	1,225
Truett & Steel	1,293	Burnand	1,198
Knight	1,289	Smith & Son,* Croydon	1,148
Quittenton	1,280		

* Accepted.

DARTFORD.—For the construction of about 1,470 yards of 10-in. pipe sewers and manholes, and other works in connection therewith, on Dartford Heath, for the Urban District Council, Mr. W. Harston, A.M.I.C.E., surveyor :—

D. Gibb & Co., 1A Birchfield Street, West India Road, E.	£3,000
C. W. Killingback & Co., Camden Town	2,871
C. Ford, 11 Nicol Road, Harlesden, N.W.	2,655
W. Border & Co., 1 Derby Gardens, High Street, Ilford	2,460
T. Adams, Green Lanes Goods Station, G.E.R., Wood Green, N.	2,351
H. Bentham & Co., Telford Avenue, Streatham Hill	2,327
G. Bell, Tottenham, N.	2,253
W. Wilson, 5 Avenue Villa, Avenue Road, Brighton	1,850
J. Jackson, 104 Clova Road, Forest Gate, E.	1,750
R. Ballard, Ld.,* Child's Hill, N.W.	1,667
W. Gibbs & Co., Ilford Wharf, Ilford	1,650

* Accepted.

LEAVESDEN (HERTS.).—For reconstructing drains, &c. at Leavesden Asylum, for the Metropolitan Asylums Board :—

Durbin & Katesmark, Manchester Square, W.	£4,645 3 3
R. P. Beattie, Victoria Street, S.W.	4,629 3 4
B. Finch & Co., Ld., Lambeth	4,108 8 0
Meston & Hale, Harlesden	3,962 6 0
Davey & Roberts, Vauxhall Bridge Road	3,894 17 5
Bracey & Clark, Watford	3,684 0 0
C. Brightman, Watford	3,674 8 0
C. Miskin & Son, St. Alban's	3,660 0 0
C. Ford, Harlesden	3,444 3 9
T. Turner, Ld., Watford	3,436 0 0
R. Ballard, Ld., Child's Hill, N.W.	3,269 0 0
A. H. Inns, Watford	3,105 10 0
Strange & Sons, Tonbridge	3,025 5 3
R. A. Crowe, Manchester	2,865 12 10
S. Saunders, Earl's Court Square, S.W.	2,723 0 0
F. Dupont & Co.,* Watford	2,442 2 8

* Accepted.

LONDON, S.W.—For the erection of New Brabazon House, Moreton Street, Pimlico, for the Brabazon House Company, Limited. Mr. R. Stephen Ayling, architect, 19 Old Queen Street, Westminster, S.W.:—

		A.
Patman & Fotheringham	£12,830	£145
Rider & Son	12,551	110
Messom & Sons	12,333	130
Mowlem & Co.	12,179	154
Patrick & Son	12,178	100
Higgs & Hill	11,984	118
Perry & Co.	11,968	124
Martin, Wells, & Co.	11,955	117
G. Gray	11,877	107
Holloway Bros.	11,785	138
A. Bush	11,672	105
Gregory & Co.	11,555	125
Kilby & Gayford	11,430	111
Gough & Co.*	11,254	130

A. Extra for glazed brick. * Accepted.

LONDON, S.E.—For the erection of medical officers' residence and male staff quarters at South Wharf, Rotherhithe, for the Metropolitan Asylums Board :—

A. White & Co., Rotherhithe, S.E.	£7,450
G. Godson & Sons, Kilburn Lane, W.	7,390
Lole & Lightfoot, Trafalgar Square, Chelsea, S.W.	6,897
T. G. Sharpington, Machell Road Works, Nunhead	6,890
T. Edge, Anglesea Avenue, Woolwich	6,850
W. Pattinson & Sons, 50 Parliament Street, S.W.	6,784
W. Wallis, Ramsden Road, Balham, S.W.	6,732
H. L. Holloway, Deptford, S.E.	6,560
Balaam Bros., Shenton Street, S.E.	6,556
B. E. Nightingale, Albert Works, S.E.	6,475
W. Irwin, 303 Essex Road, N.	6,452
F. & H. F. Higgs, Loughborough Junction	6,381
J. Appleby, Stamford Street, S.E.	6,032
W. Lawrence & Son, Waltham Cross, N.	5,949
Veale & Carter,* 45 Mill Lane, Brixton Hill, S.W.	5,620

*Accepted. [Architect's revised estimate, £6,568.]

SUSSEX.—For alterations and additions at "Bolney Grange," [illegible] Roberts. Mr. W. C. F. Gillam, architect, Central [illegible] North Street, Quadrant, Brighton :—

[illegible] Penfold, Brighton	£2,259
Field & Co., Brighton	1,899
Awcock, Bolney	1,779
Hackman, Ld., Brighton	1,775
Kemp & Son, Hove	1,685
Brockway,* Burgess Hill	1,620

* Provisionally accepted.

WALTHAMSTOW.—For the erection of four shops and office premises upon a site situate at the corner of Wood Street and Wyatt's Lane, Walthamstow, for the Trustees of the Walthamstow Parochial Charities. Mr. W. A. Longmore, F.R.I.B.A., architect, Bridge Chambers, Hoe Street, Walthamstow :—

J. Holliday, Anthony Street, London, E.	£6,200
West Bros. & Pettit, Summit Road	4,300
Snewin Bros., Clapton, N.E.	4,193
F. Padley, Erskine Road	4,000
F. Parsons, Nicholay Road, Holloway, N.	4,000
R. & E. Evans, Lisford Street, Peckham	3,938
C. T. Baker, Priory Avenue	3,696
S. J. Scott, Bishopsgate Street, London, E.C.	3,593
S. Palmer, 9 Canning Road	3,550
A. Hood, Cambridge Heath, N.E.	3,323
G. Barker, Hoe Street	3,275
T. Penn, Addison Road	3,200
Ridgeway & Sons,* Blurton Road, Clapton, N.E.	2,969
J. & T. Dean, Knott's Green, Leyton	2,850

* Accepted. [Rest of Walthamstow.]

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Hay, best	do.	4	7	0	4	15	0
Sainfoin mixture	do.	3	15	0	4	12	6
Straw	do.	1	8	0	1	16	0

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		£	s.	d.	£	s.	d.
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Colza Oil, English	do.	1	9	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	3	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	$4\frac{1}{2}$		—	
Linseed Oil, barrels	do.	1	13	3		—	
Petroleum, American	per gal.	0	0	$5\frac{3}{4}$	0	0	$5\frac{7}{8}$
Do. Russian	do.	0	0	$4\frac{7}{8}$	0	0	5
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	2	18	6		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	4	6	1	5	3
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	1	6	$1\frac{1}{2}$		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	85	0	0		—	
Iron, Staffs., bar	do.	6	0	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	10	0		—	
Lead, pig, Spanish	per ton	12	7	6		—	
Do. do. English common brands	do.	12	17	6		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do. floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	0	0	6	5	0
Do. Mild Bars	do.	7	0	0	7	10	0
Tin, Foreign	do.	131	0	0	131	10	0
Do. English ingots	do.	133	10	0	134	0	0
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	17	7	6	18	0	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Pine, Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	$10\frac{1}{2}$
Deals, Archangel 2nd & 1st	per P.Std.	10	0	0	12	10	0
Do. do. 4th & 3rd	do.	8	0	0		—	
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	21	0	0		—	
Do. do. 2nd "	do.	19	0	0		—	
Do. do. unsorted	do.	11	0	0		—	
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	8	0	0	10	5	0
Do. White Sea	do.	9	15	0	13	0	0
Do. Quebec Pine, 1st	do.	22	0	0	23	0	0
Do. do. 2nd	do.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0		—	
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	7	5	0	9	0	0
Flooring Boards, 1in. prepared, 1st	per square	0	11	6	0	13	6
Do. 2nd	do.	0	9	6		—	
Do. 3rd &c.	do.	0	6	9	0	7	3

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba	per ft. sup.	0	0	4		—	
Do. Honduras	do.	0	0	$3\frac{25}{32}$		—	
Do. Tobasco	do.	0	0	$3\frac{1}{4}$		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	$4\frac{21}{32}$		—	
Do. African	do.	0	0	$2\frac{29}{32}$		—	
Do. St. Domingo	do.	0	0	$6\frac{3}{8}$		—	
Do. Tobasco	do.	0	0	$3\frac{3}{16}$	0	3	$4\frac{21}{32}$
Do. Cuba	do.	0	0	$4\frac{29}{32}$	0	0	$3\frac{13}{16}$
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks	do.	6	0	0	17	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American	per cub. ft.	0	3	1		—	

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

JUNE 19, 1901.
No. CCCXXXII.

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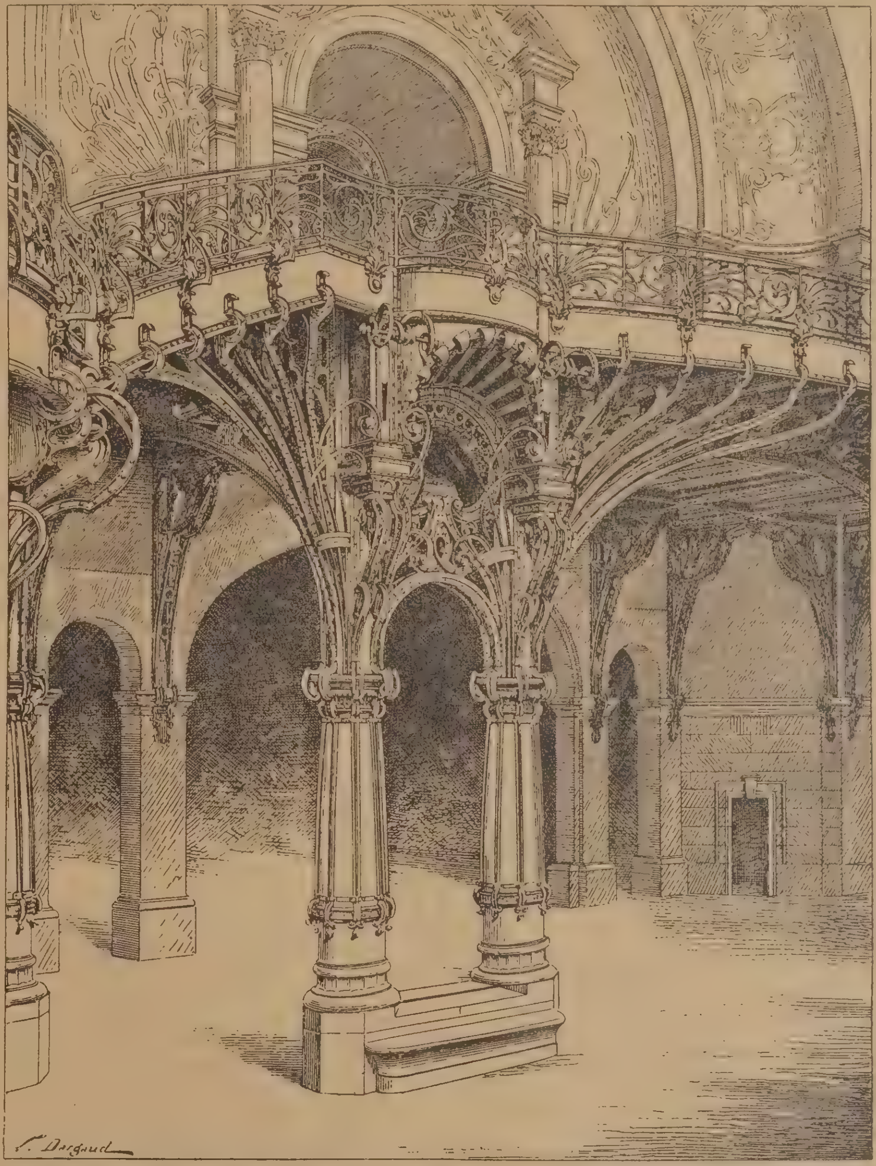
An Architectural Causerie.

"The Architectural Review." AN announcement of considerable interest is made in the current number of "The Architectural Review." It is to the effect that, in order that its contents may be as comprehensive in tone as possible, an advisory editorial committee has been formed, consisting of the following well-known architects and others: Mr. Norman Shaw, Mr. John Belcher, Mr. Frank T. Baggallay, Mr. Reginald Blomfield, Mr. Gerald C. Horsley, Mr. Mervyn Macartney, Mr. E. J. May, Mr. Walter Millard, Mr. Ernest Newton, Mr. Edward S. Prior, Mr. Halsey Ricardo, Mr. Leonard Stokes and Professor F. H. Simpson; Mr. D. S. MacColl, who acts in the capacity of literary adviser; Mr. Percy Hastings, representing the proprietors; and Mr. J. H. Elder-Duncan, as editorial secretary. In addition to securing the advice of such an eminent board, whose names are a guarantee that only the best work will appear in the pages of this high-class magazine, the proprietors have decided to reduce the price of "The Architectural Review" from one shilling to sixpence, so that it may be brought within the range of a larger number of students of architecture, professional or amateur. The committee will establish full control with the October number, though they will be partly responsible for the July, August and September issues. We wish "The Architectural Review" every success in its revised form, and feel certain that under the new régime the high reputation it holds as the only monthly magazine in this country devoted to the interests of architecture and the allied arts will be fully upheld.

A Metal Staircase. WE publish the accompanying drawing in order that our readers may see what is done by a leading French architect in the design of a metal staircase, the method adopted being intended to show how metal may be treated architecturally with happy results.



DETAIL OF STAIRCASE, GRAND PALAIS DES BEAUX-ARTS, PARIS. M. LOUVET, Architect.

The Richmond View. THOSE who have stood on the terrace at Richmond and looked down on the beautiful view of woodland, meadow and river will be in sympathy with the efforts now being made to prevent such a scene being utterly marred by rows of modern villas in red brick with stone dressings; yet there is considerable risk that the destroying hand of the builder will prevail. Most recently, through Sir Whittaker Ellis, the public has become acquainted with the fact that the stretch of land on the Middlesex side of the river between Richmond and Twickenham is likely to be laid out in plots, divided by roads, and the fine timber cut down. Already this has been done to some extent, and one sees villas of the kind mentioned protruding here and there amidst the trees. Several large houses having extensive grounds stand on the land, and when—like Lebanon House—these come into the market, the inevitable must result. At the next meeting of the Twickenham Council a member will move that a committee be appointed to enquire what steps are really needful to be taken in order that the view may be preserved, what the cost is likely to be, and what contributions might fairly be expected from the Middlesex County Council. We fear, however, that the expense will be prohibitive, though by a combined action of the Twickenham, Richmond and Middlesex Councils something might be done. For the present, the opposite side of the river is in no danger of being similarly spoiled. The Richmond Corporation have secured the preservation of the Hill, and the beautiful meadow at the foot of it; and also Petersham Eyot. But these are much less extensive than the land on the Middlesex side. If it comes into the builder's hands the view will be ruined. It is most desirable to prevent this; but we fear the worst.

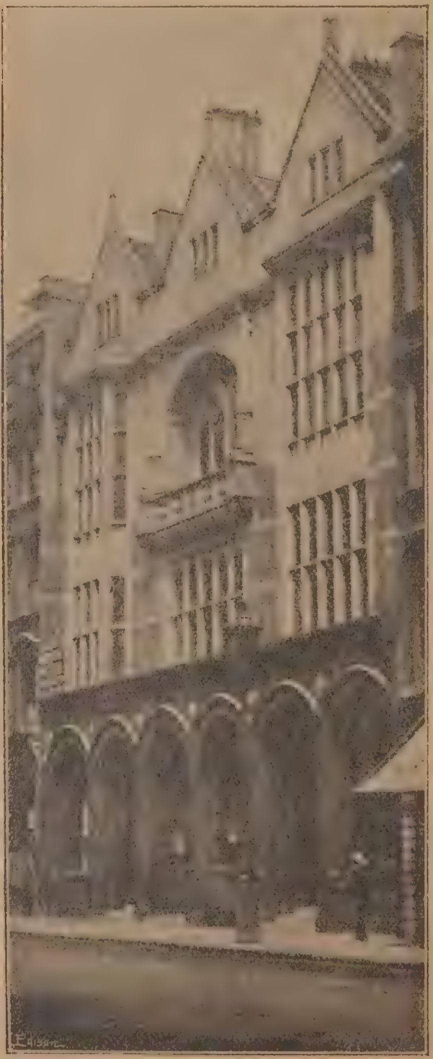
An Enigma. IT is difficult to understand what is the London County Council's notion respecting the alteration of the Strand around St. Clement Danes' Church. After considerable labour the bodies in the churchyard have been removed, a brick subway has been built, and the surface levelled and laid with wood blocks. Only a narrow strip of ground now remains around the church, and this is enclosed by a dwarf brick wall surmounted by railings. It was natural to suppose that this reduction of the churchyard was done for the purpose of giving an additional width to the roadway, which, on account of the excessive traffic in the Strand, needed widening, just as the roadway between this church and that of St. Mary-le-Strand was increased to its present splendid width by the demolition of the houses on the "island"; but instead of adopting this course, the Council have brought forward the pavement of the circus on the north side of St. Clement Danes to such an extent that it is now almost double its former width. The result is that the roadway, instead of being wider, is narrower than it was before, while the additional width given to the pavement is to little purpose, for it was quite wide enough for the comparatively few persons who pass that way. Perhaps the Council's intention is to secure a vista eastwards. If so, they could have obtained it equally well by leaving the pavement as it was, and throwing the extra width into the roadway.

NEW BUILDINGS IN THE CITY.

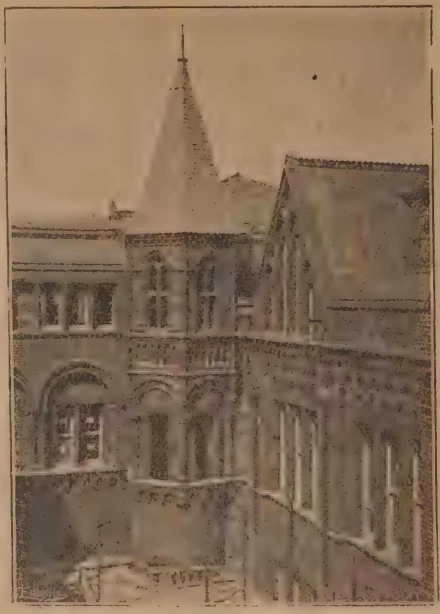
By F. HERBERT MANSFORD.

IN considering the architectural changes which are transforming the City of London it is convenient to begin at Holborn Bars, because at this point is arising what will be one of the most notable structures within the civic area. Covering slightly less ground than the Bank of England, but with a floor space vastly exceeding it, the offices of the Prudential Assurance Company will afford testimony to the magnitude of their undertaking. The chief feature of the Holborn front will be a lofty tower 40ft. square surmounting the entrance, and a modelled frieze displaying the arms of about fifty of the towns where the company have branch offices. Passing beneath the tower, the vaulted carriage-way will open into an outer court separated from the great court by a corridor with open traceried windows carried upon an arch nearly 40ft. in span. Glimpses will be obtainable here and there of a third or eastern court. The design throughout is distinctly Gothic in character, and at the present rate of progress the building bids fair to represent the last example of the Gothic revival as applied to a great secular structure. But the edifice will be emphatically modern in most respects, notably its materials—red terra-cotta, faïence and glazed bricks; these will doubtless endow the structure with that almost perennial youth so characteristic of the works of Mr. Alfred Waterhouse, R.A. (An illustration of this building was published with the issue of the BUILDERS' JOURNAL for January 3rd, 1900.)

On the opposite side of Holborn, the old-fashioned distillery, the immediate descendant of the one described in "Barnaby Rudge," has been reconstructed by Messrs. Treadwell & Martin, being faced with stone and generally modernised, displaying some of the recent tendencies of English architects in its ornamentation and the curious proportion (or lack of proportion) of its glorified gable finials. Notwithstanding, the facade is interesting because it has evidently been carefully thought out by an imaginative mind, only one regrets that the gables are shams and supported partly by tie rods from behind. (An illustration of this building appeared in the issue of the BUILDERS' JOURNAL for September 26th, 1900.)



OFFICES AND WAREHOUSE OF MR. HENRY C. STEPHENS, ALDERSGATE STREET, E.C.



ANGLE TURRET IN THE EASTERN COURT, PRUDENTIAL ASSURANCE COMPANY'S NEW PREMISES, FURNIVAL'S INN.

Between here and the Old Bailey there are no recent buildings worthy of comment; this neighbourhood was subjected to such extensive rebuilding when the viaduct was constructed that it is likely to be many years before it is much disturbed. But beyond St. Sepulchre's Church we shall shortly see great changes indeed. Even if a new street be not formed from the corner of Giltspur Street to Aldersgate Street,* as has been more than once advocated, it is probable that the site of Christ's Hospital will be largely covered with the extension of St. Bartholomew's Hospital and with commercial premises. One could wish that the great dining hall and a portion of the playground might be acquired for the Volunteers; and that the Ecclesiastical Commissioners would purchase the masters' houses abutting upon the charming garden which skirts Little Britain, to form rectories and vicarages for some of the City clergy. Wren's red-brick gateway, which formed such a pleasing bit of colour in Christchurch Passage, has already been moved to Horsham. The western end of Cheapside is being rebuilt on new frontage lines, and Newgate is soon to be demolished. Christ Church itself seems likely to be the only old landmark remaining in this quarter, for even Smirke's General Post Office is threatened with reconstruction.

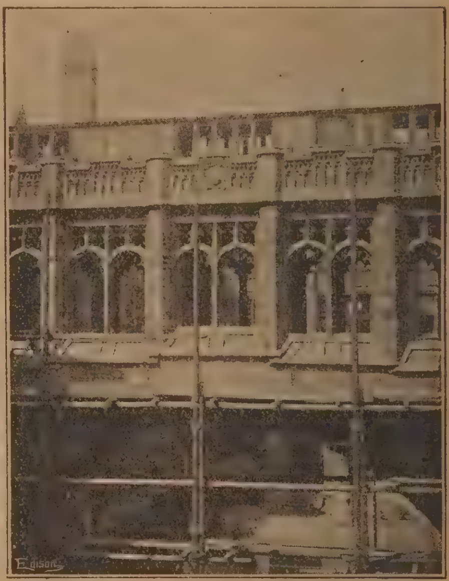
About half-way up Aldersgate Street, and occupying the site of Lauderdale House, is a striking building erected for Mr. Henry Stephens of ink fame. Some would have preferred that the elevation had been treated entirely in granite and stone without the intervening floor of red brickwork, but the generous way in which effect has been considered at the sacrifice of space should be appreciated. The three stone gables afford a roof-line particularly happy in a gently sinuous thoroughfare like Aldersgate Street.

Returning to St. Paul's Churchyard, and realising that half of the frontages have been rebuilt within the last twelve years, it might be wished that some harmonious Renaissance treatment had been initiated so that our great cathedral had been more worthily environed. To a certain extent such an idea was started with the warehouses erected upon the site of St. Paul's School, but, although the new buildings on the south side are upon ground leased from the Ecclesiastical Commissioners, the idea was not developed. Some shops that have been recently completed at the north-east entrance to the churchyard are artistically unworthy of their important situation.

Fleet Street is being subjected to a much-needed widening, and thus affords several examples of present-day architecture. As the buildings demolished were as commonplace as any in the City, the gain is indubitable. Barclay's Bank (formerly Gosling's) affords one of the most pleasing elevations, dignified and appropriate, yet its details not lacking in novel treatment. The mullioned windows which the architects, Sir Arthur Blomfield & Sons, have introduced between the Ionic columns emphasise the English character of the design; while the graceful festoons of flowers in no way counteract the soberness suitable to a bank. (An illustrated article on this bank appeared in the BUILDERS' JOURNAL for July 11th, 1900.)

On the opposite side of the street, the Law Life Assurance Society have carried out the extension of their old premises, marring St. Dunstan's tower. It is unfortunate that those in authority did not recognise how much of the beauty of the elaborate lantern was due to the contrast afforded by the plainness of the tower below. (St. Dunstan's tower, as it appeared before the insurance offices were extended, is illustrated on page 162 of the BUILDERS' JOURNAL for October 3rd, 1900.)

On the Victoria Embankment three substantial buildings, standing side by side, have been recently completed. The Metropolitan Asylums Board Offices (Edwin T. Hall, architect) are doubtless admirably planned and constructed, but their external appearance will probably be regarded as lacking the dignity of effect which is the prime æsthetic quality of a public building. The council chamber in the rear is clearly expressed externally by a separate roof treatment and its octagonal form. Adjacent are the offices of the National Telephone Company (A. T. Bromley, architect), an imposing block with an extensive frontage to Temple Avenue and a lofty gabled end towards the river. One may regret the monotony of the figure sculpture, and yet feel that the architect has achieved a work which is an ornament to the Embankment. Opposite are the offices of the Employers' Liability Corporation (William Emerson, architect). Although of Renaissance design as a whole, the sculptured ornament recalls Byzantine and even Indian art, but there is no loss of unity of effect. The purple marble columns flanking the south entrance are unpolished, and perhaps for that reason do not appear to introduce a disturbing element among the materials.



BRIDGE BETWEEN INNER AND OUTER COURTS, PRUDENTIAL ASSURANCE COMPANY'S NEW PREMISES, FURNIVAL'S INN.

There is now but one plot remaining unoccupied of the old site of the City Gas Works, which were cleared away at the time of the formation of the Embankment.

In Cannon Street the buildings which were formerly pre-eminent for businesslike solidity of effect are being replaced here and there by others which are chiefly noticeable for mere prettiness—a prettiness which will be even less effective after a few years' exposure to the London atmosphere.

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* The object of this thoroughfare is to form part of a direct route to Liverpool Street, and so relieve Newgate Street and Cheapside of much of the omnibus traffic.

Passing east of the Bank we find that the long low facade of the Drapers' Hall has recently given place to the Throgmorton Restaurant, remarkable for its showy mixture of materials—brick, stone, granite and marble used in a restless profusion that makes us sigh for the comparative dignity of its predecessor. The new entrance doors to the Drapers' Hall itself are entirely covered with metal and beautifully enriched. In Threadneedle Street a clearance has been made of the "Baltic" and other premises mainly to afford a site for the British Linen Company's Bank, but incidentally the fine gateway erected for the old Oriental Bank is thrown into prominence. Even the Wesleyan Centenary Hall is gutted previous to reconstruction, and there are few buildings in sight from this corner but have been erected within the last twenty-five years.

Bishopsgate has acquired an entirely new character owing to railways. First they rendered unnecessary the coaching inns and yards for which it was famous, then they afforded facilities for people to daily visit offices and banks, and finally they absorbed a whole quarter for their termini. The extension of the Great Eastern Company's hotel is approaching completion, and rumour now has it that the company are considering how they can best increase the capacity of the station itself. The enormous demand for offices in this neighbourhood has caused the demolition of the greater portion of Finsbury Circus. St. Mary Moorfields and the Ophthalmic Hospital have also gone down before the enhanced values of their sites.

On Finsbury Pavement are rising (from the designs of Mr. Belcher, A.R.A.) the new offices of the Eastern Telegraph Company, destined to be one of the finest blocks in this part of the City, although shorn of part of its destined sculpture.

Passing to the neighbourhood of Fenchurch Street, we come to the new street which has been formed on the site of the Dock Company's bonded warehouses. "Lloyds Avenue" promises to present two unbroken series of stone facades; certainly, at present no terra-cotta or brick elevation has intruded itself. At the corner of Fenchurch Street are the new premises for "Lloyds," who will shortly migrate from the Royal Exchange. The architect (Mr. Collcutt) has provided a noble hall on the first floor surmounted by a much lower series of rooms with windows recessed from the front by intervening rusticated columns. At the angle is a turret, with sculpture in low relief, the whole surmounted by a vane in the form of a full-rigged ship. On the side elevation is a richly-carved frieze whereon dolphins disport and ogle one another somewhat fiercely. The broken outline of the site has suggested a circular treatment to part of the building, and this portion is carried up above the roof as an open belvedere with a stone-domed top. The stone employed throughout is of a particularly pleasing colour and texture. (A corner of this building was illustrated in the BUILDERS' JOURNAL for May 16th, 1900.)

Near by, in Jewry Street, is the Sir John Cass Foundation Institute, designed by Mr. Arthur Cooksey. Dignified in aspect and somewhat original in detail, the building would have looked better perhaps if the tower had been employed to mark the main entrance and carried up rather higher. The whole structure is about the size and character of the municipal buildings of an average provincial town, and yet, probably, not one person in London out of 100 remembers having seen or heard of it. Such a reflection causes one to realise the vastness of the Metropolis, and to wonder whether its citizens will ever take the pride in its thoroughfares and buildings which is characteristic of those of some other great towns.

There is a dignity about many of the City streets, when seen fairly clear of traffic—say, on a Sunday morning—not to be found in many cities ancient or modern. The Court of Common Council are proposing to regulate the size of shop signs and projecting boards; if similar measures could prevent the wholesale obliterations caused by advertisements and scale-destroying letters, we should be spared such mortifications as Ludgate Circus. The telephone wires will shortly disappear from above our heads, but no legislation or invention will preserve the dignity of our streets if the temperament of its citizens becomes less appreciative of restraint and solidity.

PRINCIPAL ENTRANCE, CASS FOUNDATION INSTITUTE, JEWRY STREET, ALDGATE, E.C.

VANISHING VENICE.

BY ALFREDO MELANI.

THE subject of this article is one of the saddest, and it will make a profound impression on my readers. Ought I therefore to refrain from writing it? Not a bit of it. It is not the duty of the skilful surgeon to cause his patient to laugh, and it is not worthy of a respectable writer to conceal the truth. Yesterday, it was the Ducal Palace whose static conditions, although exaggerated by an official report, stirred the public. To-day, *apropos* of a new bridge over the Lagoon, it is the very integrity of Venice which has been brought into discussion, and the diabolical cry, "Venice is vanishing," is heard on every side with an insistence which would be culpable if it did not correspond with the realities, to the general condition of things that are in open contradiction with the rights of art, of history and of the beauty of the most original city of Italy.

Venice is vanishing—that is, the Venice of the Doges, with its *calli*, with its *campi*, with its little palaces, which have the delicacy of lacework—it is this Venice which, from day to day, is being wiped out as if it were merely a question of a city whose importance was a negligible quantity.

Unfortunately, even Venice, like Florence, Rome and Naples, has need of a good general plan of sanitation. If there is in the world a difficult city to be sanitated, Venice is that city. In fact, from the time that the study of the plan of sanitation was proposed, protests were raised on every side. These were the voices of artists, scholars, and the admirers of the beautiful who were united by a sentiment of fear and disapprobation; so the Italian Government, in order to soften an agitation which tended ever to expand, instead of leaving to the municipality of Venice the exclusive responsibility of the sanitation of the city, arranged that a mixed commission should be chosen in the interest of art, of history and of the public health in order that it might study the questions which were concerned in the sanitation of the city, and at the same time ordered that this Commission should present its conclusions within a reasonable length of time.

This was done, and the official report was the object of discussion, for it showed to the public a series of truths, which, alas, were found to be in perfect disaccord with the feelings of the artists.

It goes without saying that modern life has new demands, new needs, which cannot be neglected, and the Commissioners affirmed that the bad dwellings and the great agglomerations of individuals are the most pitiless enemies of the healthfulness of life in Venice.

Therefore, these habitations must be made more humane, and opposition must be made to all over-crowding, if it is really hoped to solve the matter of the regeneration of Venice; and since light and air are the essential elements of health, the suppression of several alleys is imposed on those who study the problem. To enlarge most of the streets of Venice would be to destroy the city, but some enlargement may be carried out with prudence and discretion without doing violence to the picturesque character of the city, while at the same time respecting the tortuous movement of the streets; for right lines are not for Venice, a city without horses—without carriages.

Already, sketches after this programme have been prepared, and the result has been disastrous from the æsthetic point of view. And this is why commissioners, historians and artists find themselves in opposition to the sanitarians, and these last proclaim, supporting themselves by figures, that the healthfulness of Venice is higher in those places where the typical Venetian aspect is most sensibly represented in its lines and its deplorable habits.

It goes without saying that all the Commissioners were possessed with a desire of reaching a common conclusion, at least on the essential point of the investigation, but in practice each one of them drew conclusions for his own side, and in place of having a report on the sanitation of Venice, we have different reports. the tone of each of which was that of the specialty of the several reporters; thus, the sanitarians complained of the artists, the artists of the sanitarians, who, in a letter addressed to the President of the Commission, declared that

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NATIONAL TELEPHONE COMPANY'S OFFICES.

hygiene had been sacrificed to art; that this sacrifice is neither useful nor worthy of praise; that, finally, the sanitarians are convinced of having the support of the laws of logic, and not so much because of public health as because of the improved viability of the city.

It appears, then, that the artists should have triumphed, and the report of which I have spoken should have been accepted as it stood by the Italian Government and the municipality of Venice; but, on the contrary, the report has been forgotten, and an architect member of the Commission, who is always in relation with the Government, particularly in these later days, declared, in a letter to a daily journal, that the Ministry, as well as different members of the Commission, desired that the report should be allowed to sleep; and, in fact, it does sleep, and no one as it appears will waken it. In the meantime Venice continues to find herself in danger, and her artistic integrity appears to be dissolving like a snow statue in the sun. The ruins cannot be counted, whether in the centre of the city or in those quarters of the city far from the centre; it is true that the matter relates to picturesque ruins—ruins which are the especial loves of the impressionist painter and the dreamy poet—but the condition in which some amongst them are found is not reassuring to those who, apart from all considerations of beauty, are interested in stability. It suffices to make a trip along the Grand Canal to gather enough facts bearing on the subject which interests us. The colour of Venice no longer exists except in the soul of the poet; the passage of the years as they flow by is going to finish the work of destruction, and the moderns show themselves insensible to this destruction, which, moreover, is often fortified, so to speak, by the "*soins*" of these same Venetians, who have forgotten their race and the might of their ancestors. On the Grand Canal we meet several of those pretty facades with those unforgettable "*finestrati*," little buildings with from four to six windows partly barred by walls which rise between the slight columns of these "*finestrati*"; Gothic palaces with Venetian blinds, Gothic palaces with modern additions and little isolated windows, of an elegance at once an æsthetic pleasure and a model of good taste, alternating with balconies of iron, balconies even of a commercial type which are a real offence to the most elementary laws of propriety. And halt before one of the palaces of the municipality itself still on this Grand Canal, once called the finest street in the whole world; a clock is here so placed that its effect is so disastrous that the municipality should not allow it in the case even of a private house. Next, direct your glances to the Museo Correr, quite near; beside it rises a terrible roof, the Pescheria, or fish-market, a construction with columns of a kind which would do well enough in a village, but on the bank of the Grand Canal shock the view even of those who are most insensible to æsthetic pleasures. For a long time people have been thinking of replacing this structure with a building which might be in proper relation with the beauty of the place, but long discussions have not yet resulted in anything real. There exists, however, a project for a fish-market prepared by M. Rupolo, an architect to whom has been confided the restoration of the Ducal Palace, and M. Laurenti, a Venetian painter full of suggestiveness and sincerely in love with his art; and we can only hope for the realisation of their scheme, which will destroy for ever the ugliest building on the Grand Canal. And think for merely a moment that this old Pescheria, besides not being far from the Museo Correr, is almost facing the celebrated Ca' d'Oro, the most charming of the Venetian edifices which formerly gave life to the Canal and afforded to the eye the joy of the most exquisite forms which can be imagined. Thank God, the Ca' d'Oro is going to be restored at the expense of Franchetti, its present proprietor; and in the midst of the ruins, the dangers, the disgraceful additions on the Grand Canal, here the eye rests with satisfaction.

Now listen to what the Venetian Section of the Italian Society for Public Art has to say, for on the matter of Venice it uses words of an exemplary frankness and directness. Artistic Venice has no more time to lose, it says. Destroyed are its private galleries; migrated are its paintings, its bronzes, its well-heads, its most beautiful friezes; exported are its mantelpieces, its doors, its mural decorations and the ceilings of its ancient richness. Except for a few palaces, still preserved, there remains to-day only the curtain of the facades, and it is precisely to save this glorious remnant that provision must be made. To succeed in this it is not necessary to demand new laws, it is enough to revise those which exist and make them respected without exception. Respect for the law is really one of the most important points in the question. In fact, Venice, like all the cities of Italy, has its Regulation of Public Edility, respect for which might be enforced in favour of the integrity of the city, much more than would appear at first sight. Do you know how many pieces of carved marble, whether they came from the facades or the interior of the palaces, have been taken away and sold, to the great damage of the artistic patrimony and exterior beauty of Venice? An incredible quantity. I was in London last month, and, in visiting anew South Kensington Museum, I was thunderstruck at the number of Venetian marbles and sculptured stones. It was the love of Ruskin and all that was Ruskinian which urged the English to bring to London everything Venetian that they could get hold of whenever such things were put up to auction by the Venetians; and the English, thanks to the condescension of the Venetians and the indifference of the authorities, little by little have drawn to the Museum on Cromwell Road, and even to the Museum in Trafalgar Square, not only marbles and carved stones, but also the paintings from the Pinakotheks of Venice. This affects the honour of those who believe in the existence of an intellectual life which is in need of fertilising itself amidst the pleasures of art, and I speak of it only to point out a real fact, which could not exist if the Regulatoin of Public Edility at Venice was not almost always a dead letter. In fact, this Regulation forbids anyone whomsoever to place, to change from its place, or to remove from the outer walls of any buildings, monuments, objects of art or anything having an historical or archæological interest, any decorations, whether in stone or terra-cotta, or any paintings, cartouches, armorial bearings, &c. Well, if this article of the Regulation were enforced as it ought to be would it be possible to see Venetian antiquaries becoming agents for the transfer of sculptured stone from Venetian proprietors to foreigners? Surely not. Nor am I speaking only of the past—I address myself to the present time, for the difference is less apparent than it might be, as one can easily see: the shops of Venetian antiquaries are full of objects of art, of fixed decorations and architectural ornaments, which have been removed capriciously, or for the sake of being turned into money by their owners, to the great disfigurement of the Venice of the artist, the Venice of the intellectual, the only Venice possible in the eyes of persons who think.

I do not change the subject from the Regulation in exposing a new truth which will not fail to give my readers surprise. The city of Venice, beside the Regulation of Public Edility, has also a Municipal Bureau of Engineers, a technical bureau. One would believe that a technical bureau should be composed of architects, or even of engineers, in such a city as Venice, which is artistic beyond everything. But not a bit of it. Above the doorway of this Bureau might be put, as Balzac wrote on the title leaf of his "Physiologie du Mariage," "Art enters not here." [Balzac wrote "Women enter not here."] And when one knows that, in Italy, engineers, as a rule, have no knowledge of architecture—even those who erect palaces and churches—one easily measures the gravity of the situation which I draw attention to, which weighs terribly upon the fate of ancient and modern architecture in Venice. There is a Commission for Ornament, but the event has proved that its successes are not glorious; and, however that may be, a reform on this subject is necessary. The integrity of Venice demands the modification of the Municipal Technical Bureau and of the Commission for Ornament.

I ought not to forget that one of the enemies of Venice is quite a stranger to art, to construction, and to all speculation in objects of art, and that is the little launches which, from morning till night, tear up and down the Grand Canal. We are assured that these "*vaporetti*" are not of the most approved type, and that the wash of the waters they produce in the Canal breaks and decomposes those foundations which are not of stone (*macigno*), enlarging cracks, and hastening to a critical condition the stability of the palaces.

They say that it is because of this that they are going to project a new bridge over the Lagoon, and this bridge has been the object of feverish agitation, not so much because of its uselessness (according to the opposition) as because of the dangers in which Venice would be found later through this enlarging of its streets to answer new demands of viability because of this new passage-way opened over the Lagoon. This would be a new and formidable buffet in the faces of those who love Venice, who love its beauty, although they are not of the country. The chief fact is this: the artists are the principal enemies of this new bridge over the Lagoon, which is to connect Venice with the mainland. —(From "The American Architect.")

NEW CHURCH AT NEWCASTLE.

A NEW Wyclif Baptist Church at Newcastle-on-Tyne is now being erected in Elswick Road. The style is Perpendicular Gothic, freely treated. The accommodation in the church is for 300 adults, or for a mixed congregation of about 360. A future end gallery is provided for, to seat 160 adults or 120 mixed, or an eventual total of 470 mixed. The choir is on the platform, in front of the pulpit; and the baptistery is also on the platform, covered when not in use; the organ is in an apse behind the pulpit. The building consists of a wide nave with hammer beam, open-timbered roof and plastered ceiling, with double transept on each side, with timber arches supported on iron columns, each transept being lighted by a three-light traceried window. There are two two-light traceried windows in each side wall of the nave. A spacious portico projects in front, with vestibule and inner lobbies with swing doors, and a vestry on one side and a staircase on the other side in the tower will lead down to the school and up to the gallery in the future. There is a staircase on each side of the pulpit leading down to the school below the church and to ministers' and deacons' vestries. A ladies' vestry is situated behind the pulpit. The seating is arranged semicircularly on plan, so that every hearer directly faces the minister. The heating will be by hot-water pipes and radiators. There is an exit door from the tower, and another from the back into Northbourne Street, the two front entrances being from Elswick Road. All doors open outwards. There is a spacious school under the church and a church parlour 19ft. by 13ft., and also heating chambers, lavatories, &c. The school will be well lighted by large windows into areas and streets. A ventilating flèche on the roof will withdraw the heated air, with gas accelerator to assist upcast, and fresh air inlet shafts to admit fresh air. The seating is of panelled sloping backs, with book racks, &c., varnished. The windows will be glazed with lead-lights. The external walls will be faced with red pressed facing bricks, with tawny terra-cotta dressings and tracery, &c. The contract for the building is £4,383, including boundary walls, gates, railings, &c., but exclusive of upper portion of tower. The builder is Mr. Alexander Bruce, of Newcastle. The architects are Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5, Clement's Inn, Strand, London, W.C.

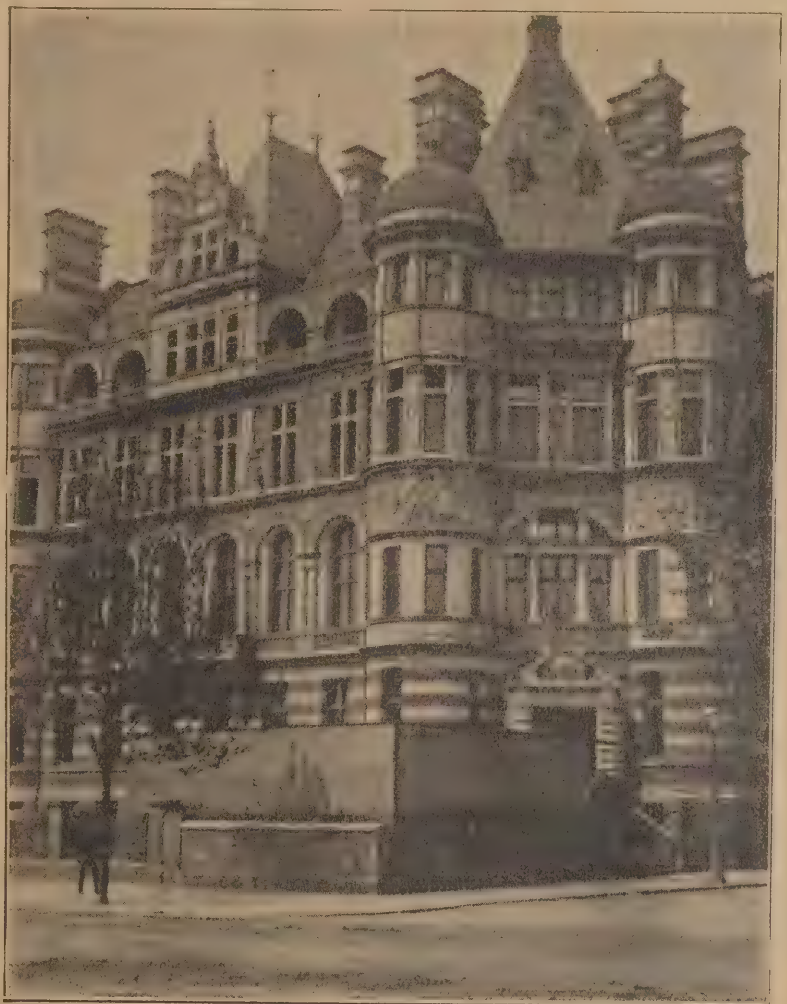
Mr. R. C. Leslie, eldest son of the late Mr. C. R. Leslie, R.A., and brother of the present Royal Academician, Mr. G. D. Leslie, died on June 11th. Mr. R. C. Leslie was a marine painter of considerable ability. He was an intimate friend of John Ruskin.

TRADE TRAINING.*

BY W. J. COLLINS.

AT a recent meeting of the Architectural Association of Ireland, Mr. John Good (hon. secretary of the Master Builders' Association), delivered an address on "Some Aspects of the Labour Question as applied to the Building Industry" (see p. 103 of the BUILDERS' JOURNAL for March 13th last) in the course of which he speaks of the apprenticeship system as being capable of immense improvement in "instruction, inspection and examination," and he insists that both theoretical training and practical instruction are necessary. This is the subject with which I now wish to deal. How can we supply both the theoretical and practical training in the best possible manner?

In the past trade training was accomplished by a system of apprenticeship, and until the introduction of machinery it was very successful. The reputation of the English mechanics as the best and most skilful of the world's workers was gained when the apprenticeship system was in force, and every one had to serve his time, usually seven years. Of late this custom has almost entirely died out, and we have nothing as yet to take its place. Some may ask, if this system was so successful, why not try to reinstate it? I propose to deal, first, with the need for practical training; secondly, the need for theoretical training; and lastly, to suggest a remedy.



METROPOLITAN ASYLUMS BOARD'S NEW OFFICES, VICTORIA EMBANKMENT. E.C.

The Need for Practical Training.

At the commencement of the nineteenth century the craftsman stood in practically the same position, so far as progress was concerned, as his predecessors did for hundreds of years. What advantage he may have possessed was due to any improvements that may have been made in the construction of the hand tools used. How different it is now! Very few hand tools are required for ordinary work. The introduction of machinery has so revolutionised the production in all trades that the method of working has entirely altered, and what was suitable one hundred years ago is entirely out-of-date to-day. Take our own trade as an example. In a large joiner's shop to-day the joiner often does not see the work until it is ready to be put together, whereas formerly he would have had the rod and rough stuff given to him and would have created the work himself. Should there be an apprentice in a shop like this, where the elementary part of the work is never prepared, I do not see what opportunity he has of learning how to do it. In olden times he saw the work from the commencement, consequently he had every opportunity of learning the practical part of his trade in the shop. But—and this brings us to another question—if the mechanic will not be required to perform these operations, if they are always to be done by machine, is it necessary that he should learn how to do them? I think he should, most decidedly. If a man is to be master of his trade, he must know it from the beginning. The practice in the a, b, c of his work will give him that skill of hand and confidence in his own ability which is absolutely necessary to enable him to perform his task with the accuracy essential to the production of good work. If you agree with this, I think you will also agree that under these new conditions of working new methods are necessary for learning a trade.

In the "Daily News" for December 22nd last Mr. T. A. Organ, chairman of the L.C.C. Technical Board, in referring to the dearth of apprentices in London, says "it is disastrous to our London boys," and adds that "many country lads have the advantage of apprenticeship, and in the end migrate to London, and eventually occupy the highest positions in their respective trades." Mr. Organ may be right, but I think it more probable that they have learnt their trade more thoroughly, owing to there being less machinery employed. However, in spite of all I have said, I believe a shop training to be necessary; but there must be some means by which a lad can learn the rudiments of his trade, which at present cannot be done in the shop.

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* A paper read at the Carpenters' Hall, before the British Institute of Certified Carpenters, on May 4th, 1901.

Theoretical Training.

So far I have dealt only with the practical training, but I think you will agree that a theoretical training is also necessary if a man is to be anything better than a machine. I know many of the older mechanics who learnt the trade before the days of polytechnics or evening schools will say that they never attended classes, that they can work as well as any other men, and that this extra study is unnecessary. But I am pleased to think that this opinion is dying out. The increasing number of young men who present themselves for examination by the City Guilds and the Education Department shows that they themselves recognise that something else is necessary to make a good mechanic besides the ability to use his tools. The reason that more students do not present themselves is, in my opinion, due to the want of a system of training. The City Guilds took a step in the right direction when they refused to issue a full certificate to those who passed their examinations unless they had previously passed in at least two qualifying subjects (such as Mechanics and Geometry) which had a bearing on the theory of their trade.

The following remarks on plumbers' apprenticeship may be interesting, as showing that other trades are meeting with a difficulty in this subject: "In London, and indeed in the Southern Counties generally," says the "Lancet," "the system of apprenticeship in the plumbing trade has been gradually dying out, while the plumbers' ranks, as a rule, have to be recruited from a class of men known as plumbers' mates; now the master-plumbers, together with the operatives, have at length recognised the importance of this fact. They are of opinion that it is a system alike injurious to the best interests of the London plumbing trade and to the public health. A joint board has therefore been formed under the influence of the Worshipful Company of Plumbers, consisting of certain elected members of the London Society of Associated Master Plumbers, together with representatives from the London lodges of the United Operative Plumbers. The aims of the board are to encourage the taking of apprentices under an agreed form of indenture; to exercise a certain control over the apprentice, so as to insure his attendance at a duly approved technical school; to examine him occasionally as to the progress made in practical and theoretical knowledge; and, finally, to register him in order that information as to his training and abilities may be accessible at any future time." I think something similar to this might be done under the auspices of the Worshipful Company of Carpenters.

An American Professor's Opinion.

Among the diplomatic and consular reports in South Kensington Museum library I found one entitled, "Education in Chicago," received at the Government offices in this country on November 5th, 1900; so that it is quite recent. After speaking of the technical schools in Chicago, and of the interest which is taken in technical training in that city, the consul gives extracts from an address by Mr. Victor Aldersen, Dean of the Armour Technical College (who last year visited most of the European cities where technical education is provided), the subject of the address being "The Economic Aspect of Technical Education." Among other things he says: "The continued growth and prosperity of any nation depend upon the technical education of its people. The war in South Africa or the Philippines is less fatal to the working man than the ceaseless competition of similar working men in other quarters of the globe. It is this unremitting rivalry between workers of the same class all over the world that makes necessary the cultivation of the working man's powers by means of technical training." Later on he speaks of the system of evening classes in London. He does not agree with them, because "after a man has been working all day, he is not fit for study at night, and his best energies are as necessary for his studies as his manual work."

Lord Reay was speaking on the same subject in this hall on the occasion of the distribution of prizes to students of the trade classes towards the close of last year, and from his speech we learned that the French and Germans have not only recognised the need for the training and better education of artisans, but have established schools for the purpose; and I do not think I can do better than read you an extract from a book on the apprenticeship schools in France which I found in South Kensington Museum library:—

"It has been recognised in France, as elsewhere, that the ordinary system of apprenticeship has many shortcomings, and is not unfrequently productive of far-reaching evils. The apprentice is too often entrusted to the direction of an artisan or foreman little interested in his instruction, or perhaps incapable of instructing him by a graduated succession of exercises in the principles and practice of his trade. The method of instruction is thus little favourable to the development of ultimate skill and perfection.

The Apprenticeship School at Rouen.

"The apprenticeship school at Rouen, founded by the municipal council of that city, aims at training well-instructed artisans and foremen in the various trades and occupations in wood and ironwork. Pupils, on entrance, must be at least twelve years of age, and provided with a certificate of primary studies. Candidates not holding the certificates must be at least thirteen years of age, and are subjected to an equivalent examination. The course is one of three years, and young apprentices are formed into three sections corresponding to each year. The course of instruction includes a complementary course of literary instruction, a course in arts and sciences, and the technical instruction. The course is free, and tools and materials are supplied gratuitously. The school is under the control of a committee selected by municipal council, under the presidency of the Maire of Rouen. Apprentices must enter the school at 7 a.m. throughout the year, and are not permitted to leave, except by permission of the director, till 6 p.m. They take their own dinners, and dine in a refectory under the superintendence of one of the masters. Their food is heated by the servants. Those habitually absent are expelled from the institution.

Its Programme of Work.

"The programme is divided into four parts: (1) General literary education; (2) drawing; (3) technology; (4) workshop instruction.

"The general course is a continuation of the primary school course, embracing the principles of those sciences which underlie the trade in which apprentices are being trained. It is a course which imparts special information, and aims at that general mental development which is an essential element in the training of the young worker who strives at perfection in his craft." Then follows a list of subjects with which I will not weary you. The writer concludes: "We have only given a summary of the course of practical instruction in the workshops such as may give a general idea of the character of the training which apprentices undergo in the institution. Taking into consideration the standard of general education which pupils must have attained on entrance to the school, and the instruction in literature, science, &c., which goes on simultaneously during the whole course, it will readily be seen that apprentices trained in this manner must turn out more intelligent and efficient workmen than those trained by ordinary apprenticeship."

Some Particulars of the Paris School.

The following is an extract from the report of the City of Manchester Technical Instruction Committee (who have been visiting a number of cities on the Continent to gather information for the new Technical College at Manchester) relating to the apprenticeship school in Paris:—

Age of admission, 13 to 16. Candidates must pass a preliminary examination. A boy enters the school as an apprentice for three years.

The first year's course is higher elementary education in mathematics, mechanics, history, physics, geography, chemistry, &c., and the apprentice passes from one workshop to another in order to find his special aptitude.

In the second year he must have chosen his trade, and is then kept steadily working at it, both in theory and practice, as well as his ordinary studies.

In the third year the same course continues. The instruction is gratuitous, and tools and material are furnished free of cost.

Remedies.

I have endeavoured to show you in this paper (1) that practical training is necessary, (2) that theoretical training is necessary, (3) that the old method of apprenticeship does not satisfy the requirements under the new conditions, and (4) the manner in which they are striving to meet the difficulty in another country.

Although I do not agree with the French schools entirely, yet I believe that an apprenticeship school is the way by which trade training will have to be accomplished.

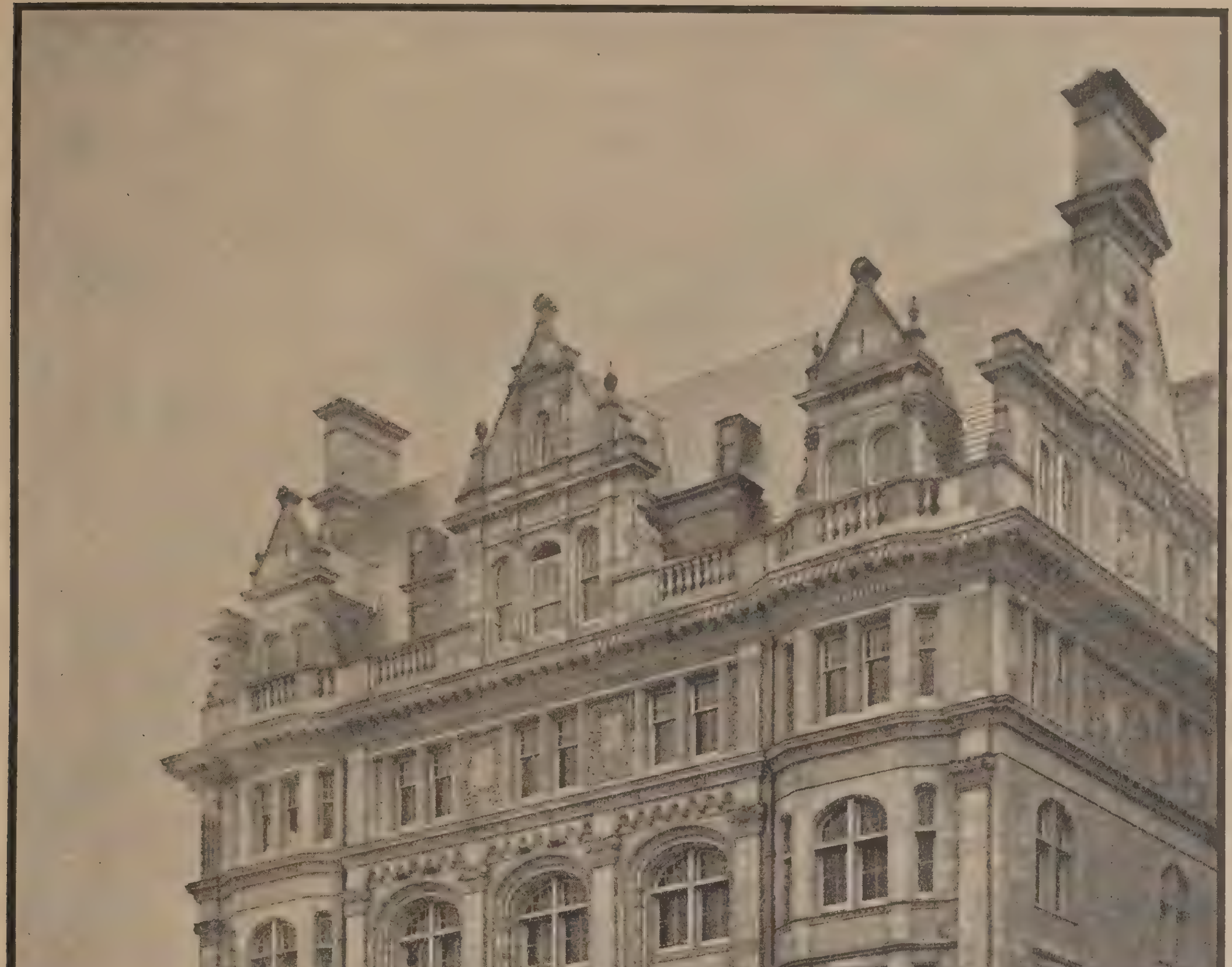
I think that twelve months wholly in the school is long enough, the rest of the time being spent partly in the shop and partly in the school. Examinations should be held at stated periods; and if the apprentice does not show sufficient progress he should be dismissed.

As to admission to the schools, I think that should be by examination, and I also think that as manual training is now so general, a report from the candidate's school-teacher and instructor as to his fitness for a mechanical pursuit might be of advantage.

The above is only my idea of the lines upon which the trade training in the future will have to proceed. I think the question is one which we, as carpenters and joiners, must seriously consider, as the woodworking trades are more affected by machinery than others in the building industry. Although I have mentioned the building trades specially, I think the system would apply to all.

SOUTH SHIELDS MUNICIPAL BUILDINGS COMPETITION.

MR. T. E. DAVIDSON, architect, of South Shields, writes to the "Shields Gazette" as follows: "Having just had the opportunity of inspecting the three selected designs for the proposed municipal buildings, I cannot refrain from expressing my disappointment at the result, and I hope that the question I am about to call attention to will be replied to upon its merits, and without in any way bringing in the personal element. I do not so far attach any blame to the committee, they having done their best to conduct the competition on fair lines, but I think the time has come when the whole matter should be reconsidered both in the public interest and in that of the seventy architects who have spent so much time and money in the preparation of their plans. What I complain about is this: the Corporation issued certain particulars or requirements and with them a printed plan of the site showing the surrounding buildings. For these each competitor had to pay £1, to be returned on receipt of a bona-fide design. This site plan showed clearly the lines of existing buildings in Ogle Terrace, St. John's Terrace and Broughton Road, but on examining the plans I was astounded to find that all three selected plans had entirely ignored these building lines and shown buildings that will completely cover up St. John's Church on the Ogle Terrace side, and Mr. R. Purvis's residence on the Broughton Road side, which would be contrary to the third section of the Public Health Act of 1875, which says that 'No building (or part thereof) shall be erected or brought forward in any street, or any addition made thereto, beyond the front main wall of the building on either side thereof in the same street. Daily penalty 40s.' . . . . . What I wish to point out also is that those competitors (including the three selected ones) who have taken this liberty of ignoring the defined building lines, and thus increased their frontage by 50ft., have taken an immense advantage over others who have kept their building to the proper lines, and I invite Mr. Belcher respectfully to give his explanation on this, what I consider, fatal objection to the three selected plans, and I also invite the committee to say whether it is their desire to allow their new municipal buildings to come out practically to the footpaths in Ogle Terrace and Broughton Road, as shown by the three selected designs."



HAMILTON HOUSE, VICTORIA EMBANKMENT. WILLIAM EMERSON, P.R.I.B.A., Architect. (*Photo by H. Irving.*)

Builders' Notes.

Mr. R. Hodgson, builder and contractor, of Hurworth-on-Tees, died recently at the age of sixty-five years. In addition to carrying on the business of a builder in all its branches, he owned and worked the brickworks at Skip Bridge, and farmed some land in the township of Hurworth. His business will be carried on by his sons.

The Slate Trade.—At a recent meeting of the Carnarvon Harbour Trust it was stated that the amount of slates shipped during the month of April was 6,359 tons, an increase of 1,419 tons on the corresponding period last year. During the preceding three months the quantity of slates shipped was 23,790 tons, an increase of 3,801 tons on the corresponding period last year.

Breach of Building By-laws.—At the Halifax Borough Court, John Taylor, Stanley Road, was recently summoned by the Corporation for a breach of the by-laws. The defendant pleaded guilty to erecting two houses in Highfield Place without giving notice of his intention to build to the Corporation, in accordance with By-law 96. He was away from home at the time and his foreman neglected to give notice. A fine of 20s. and 5s. 6d. costs was imposed.

FIRST CHURCH OF CHRIST, SCIENTIST, GRAND FORKS, N. DAKOTA, U.S.A. F. R. COMSTOCK, Architect.

Partnership Dissolved.—The partnership existing between Messrs. Thomas Crawshaw, William Crowther, George Burton Maud and Arthur Crawshaw, carrying on business at Halifax, in the county of York, as builders and contractors, under the style or firm of "T. Crawshaw & Co.," has been dissolved as from the 30th day of April last, so far as regards the said William Crowther, and the said business will hereafter be carried on by the Messrs. Thomas Crawshaw, George Burton Maud and Arthur Crawshaw alone, under the style or firm of "T. Crawshaw & Co."

A New Flooring.—A German chemist is reported to have found means, by mixing sawdust with certain chemicals, of producing a flooring which is as hard and smooth as marble or concrete, and yet elastic and warm to walk on. It is stated to be fireproof, impervious and sound deadening, and although laid down for some years to have in no instance shown signs of bulging or cracking. It is laid down in a moist state without seams, and thereby allows of the corners and sides being rounded off, an important point from a hygienic point of view. It hardens fully in forty-eight hours.

Pentelicon Marble.—The recent development of the Pentelicon marble quarries in the Piræus is described by the British Consul there in his report on the district for the past year. The quarries are now under a British company which has spent a very large sum in laying down railways and machinery; and it is hoped that everything will be in working order there by the end of the present month. There is a considerable demand for this marble in the Greek market, and a contract for a large quantity for the Stadion at Athens has been made. It appears, also, to be likely that the marble will find a ready sale abroad. Inquiries are made from all parts of the world, and trial shipments have been despatched to the United States. Hitherto Pentelicon marble has been shipped mainly to Germany and in German ships, because the latter have specially strengthened their gear for the purpose of loading and unloading marble. Cippolino marble from the south of Eubœa is being produced in larger quantities also.

LIVERPOOL SCHOOL OF ARCHITECTURE AND ALLIED ARTS.

BADLY IN NEED OF FUNDS.

WRITING to the "Liverpool Post," Mr. Walter Raleigh says:

With a cathedral and a university in prospect, the future of Liverpool promises well. These schemes will take long to complete. In the meantime a more pressing necessity claims the attention of those citizens who desire to see their city great and famous. The School of Architecture and the Allied Arts, which was founded in connection with University College some six or seven years ago, is an experiment that has perhaps attracted less attention than it deserves. The nucleus of the school was found in the Chair of Fine Art in University College, a Chair which had been devoted, during the tenure of Professors Conway and Stevenson, solely to verbal exposition, criticism, history and archæology. By degrees, chiefly under the inspiration of Professor R. A. M. Stevenson, the opinion gained ground that a Chair of the Fine Arts could not do its right work in a great city while it was totally dissevered from the practice of the arts. By the generosity of the city it was made possible to give effect to these views; and there was established a school of the most comprehensive and ambitious character, in which all the most important of the arts and crafts that are, in any of their applications, subservient to architecture were grouped together in the closest relationship to each other. The school has thrived; it is working a revolution in the education of architects, and in the other arts has attracted to itself artists and students of distinction and promise. But the school, by the very rapidity of its growth, lacks money. And the temptation to sin often comes to an institution, as to an individual, under the stress of poverty. It appears that money is to be had by those who will accept the terms on which it is offered. By accepting some measure of control from the central national organisation that is still popularly known as the Science and Art Department, South Kensington, the Liverpool school can eke out its finances and continue its activities. The question is whether this School of Architecture and the Allied Arts, the child of this college and this city, which has hitherto admitted no external control, but has grown up freely under local conditions, shall throw itself into the South Kensington organisation, and submit to the Central London Authority. I trust that the board will refuse this solution of their difficulty.

A Criticism of the South Kensington System.

Of all kinds of education, art education has least to gain and most to lose by centralisation. For art, if it has life in it, is a growth, and a growth of infinitely diverse forms, eternally experimental, original at the peril of its life, adapting itself to the shifting conditions that environ it. It is far from my purpose or wish to abuse or decry the men in whose hands, as teachers or directors, the South Kensington system rests. Doubtless they do their best under the system that they inherit. If it were really necessary that teachers of no originality should continue to produce pupils of no distinction at the cost of enormous mechanical labour, the system, with its monster national competitions and its sedulous cultivation of niggling, is well adapted to achieve that end. A "national competition," to anyone who has thought about art and cares for what is vital in it, is in itself an absurdity. Success in such a competition must always be achieved in well-worn grooves. The judges are little likely to recognise rare, shy, or curious merit; the business is too risky; they will generally return verdicts that are readily understood, and give prizes to trained skill in the service of an average purpose. The works to be judged are disparate and incommensurable in style and in aim. The real encouragement of art for the possibilities and the promise that it shows belongs to local authorities and teachers, above all to a school which is free to develop its own style and to work out its own destiny. The support of such a school where it already exists is surely a privilege and a duty in a city like this, which dreams of high destinies. With an art and a style of her own, the city might be confident of her future.

But all, I shall be told, is changed. The Department of Science and Art is now reconstituted and renamed the Board of Education. It is controlled by good artists and wise men. If so, then King Log has become King Stork. Men who undertake to control the artistic activities of a whole nation are dangerous and harmful exactly in proportion to their abilities. The only hope for a system of "grants by results" and "national competitions" is that it shall fall into incompetent hands. A strong man, or a body of strong men, will make it seem plausible, and will impose on the intelligence of the man in the street, or in the council. What they cannot do is to awaken the impulses that create original art in a community, or to give the sympathies that encourage it. It is a part of the ill-fortune of generous and wealthy men that they are often unable to tell how their money will be used, or whether it will be of real service to the end they have in view. But here the thing exists, and asks only to be saved and developed. If it falls into the great national drag-net there will go with it all the high hopes of a revival of art in Liverpool which originally actuated its founders, and which at this moment actuate the little company of artists that are its staff.

THE BRITISH FIRE PREVENTION COMMITTEE'S VISIT TO BERLIN.

AS already reported in our columns, the British Fire Prevention Committee, at the special invitation of the German Government, arranged to send a deputation to Berlin, firstly, with the object of attending the International Fire Congress; secondly, to see the great Fire Exhibition which had been organised in that city; and, thirdly, to make itself acquainted with the effect of the new building and factory regulations upon structural work in the capital. The deputation (which included Mr. Edwin O. Sachs, the chairman, and the Committee's resident engineer) met with a very cordial reception.

On the second day the Congress was opened in the central council chamber of the Imperial Houses of Parliament, when no fewer than 2,000 members were present, half of whom were district surveyors, engineers, architects and insurance experts from all parts of the world, whilst the other half included chief officers of the leading professional and volunteer fire brigades. The Congress was presided over by the German Minister of Finance, with four vice-chairmen, namely, the Minister of Interior, the chairman of the Central Council (Count Kamerovsky), Chief-Officer Westphalen of Hamburg, and Mr. Edwin O. Sachs; whilst among the official guests on the special visitors' tribune were representatives from nearly every public department in Germany.

Among others, the two following resolutions were passed:—

(1) "That the careful investigation of fire-resistance of building materials and systems of construction was a subject that should have the support both of the Government and local authorities as well as of the technical societies, to the members of which the results of such investigations are of importance in the practice of their profession."

(2) "Owing to the fact that identical materials and systems of construction are frequently employed in different countries, an effort should be made to standardize the results obtained from fire tests in such a manner that the investigations made in different countries could be compared in a practical manner, with due regard to units of measurement and temperature.'

In the evening a big banquet was given at the Exhibition, at which the Minister of Finance again presided, supported by the vice-chairmen named above. The next day was again devoted to a considerable amount of Congress work in the Houses of Parliament. In the evening the British Fire Prevention Committee gave their banquet, when a message was received from the Emperor William, and two speeches were made by Sir Frank Lascelles (the British Ambassador). Mr. Sachs presided. Altogether the Committee's banquet was a very great success. The next day was entirely devoted to the inspection of buildings in the capital.

After staying another day at Berlin, the party moved on to Hamburg, where arrangement were made for another official reception.

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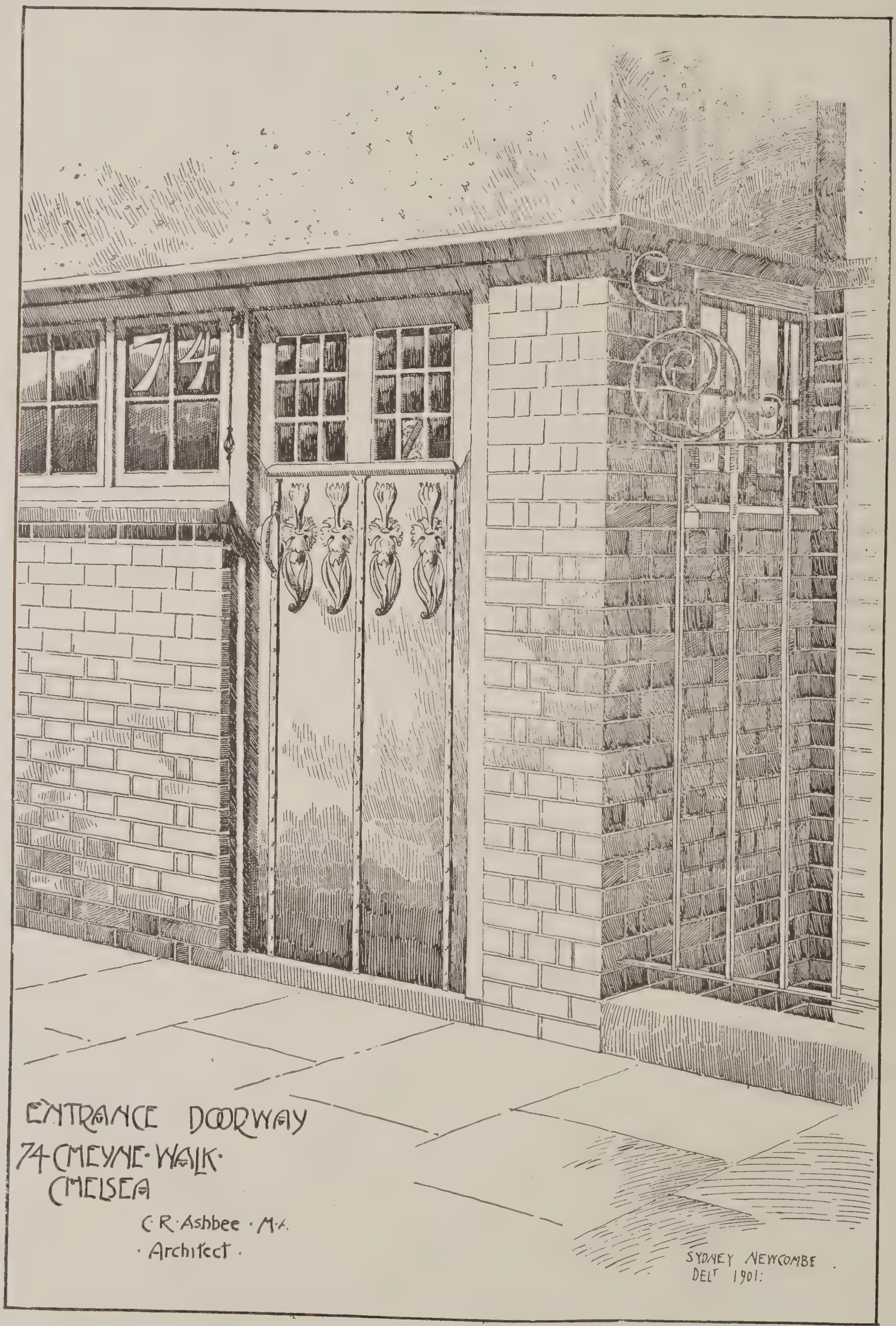
Wednesday, June 19th, 1901.



LONDON STREET ARCHITECTURE.

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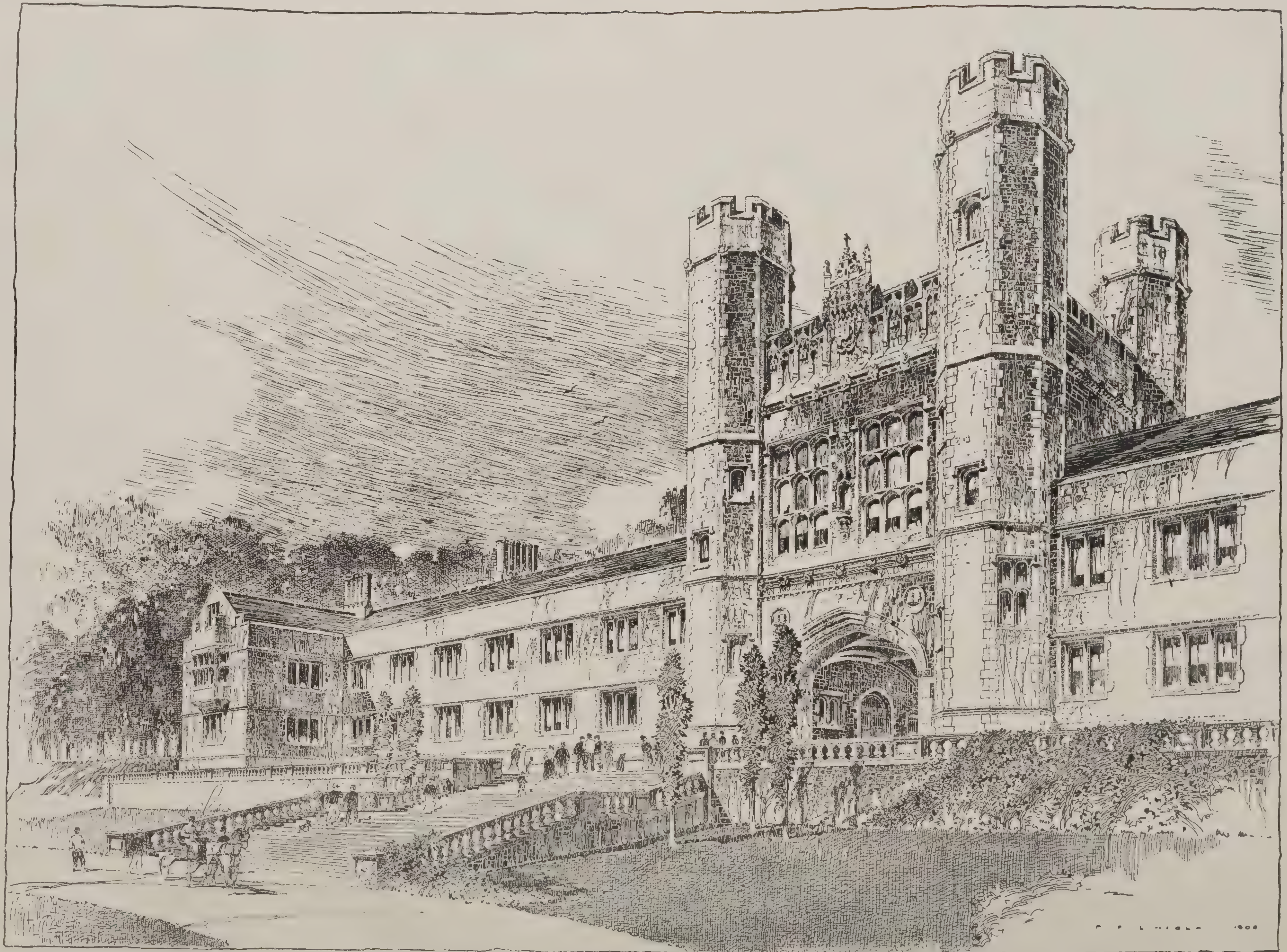
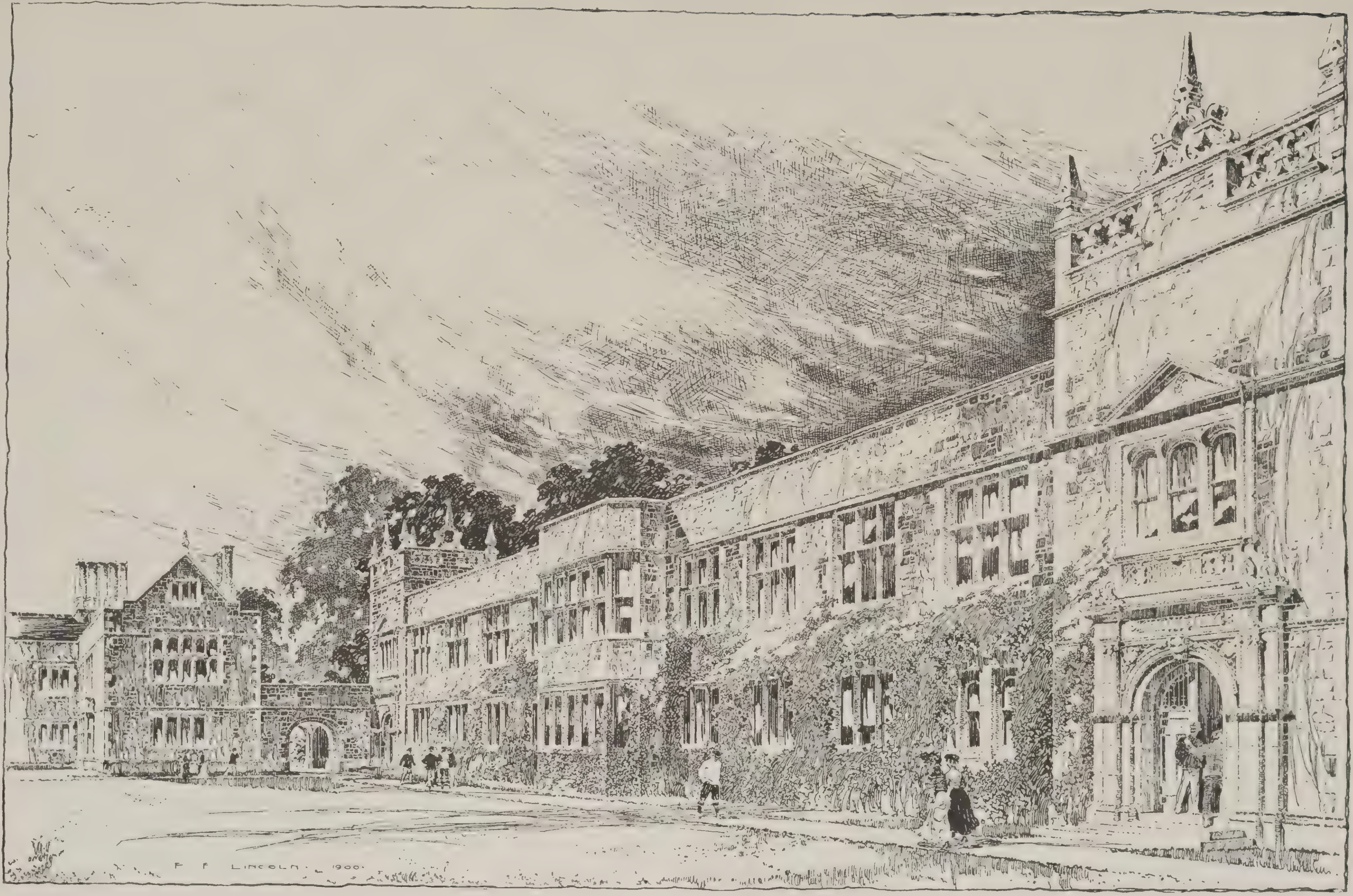


ADMINISTRATION BUILDING, WASHINGTON UNIVERSITY, ST. LOUIS, MO., U.S.A.

COPE AND STEWARDSON, Architects.

Supplement to
The Builders' Journal and Architectural Record,
Wednesday, June 19th, 1901.


F. F. LINCOLN. 1900.

BUSCH BUILDING, WASHINGTON UNIVERSITY, ST. LOUIS, MO., U.S.A.

Cope and Stewardson, Architects.

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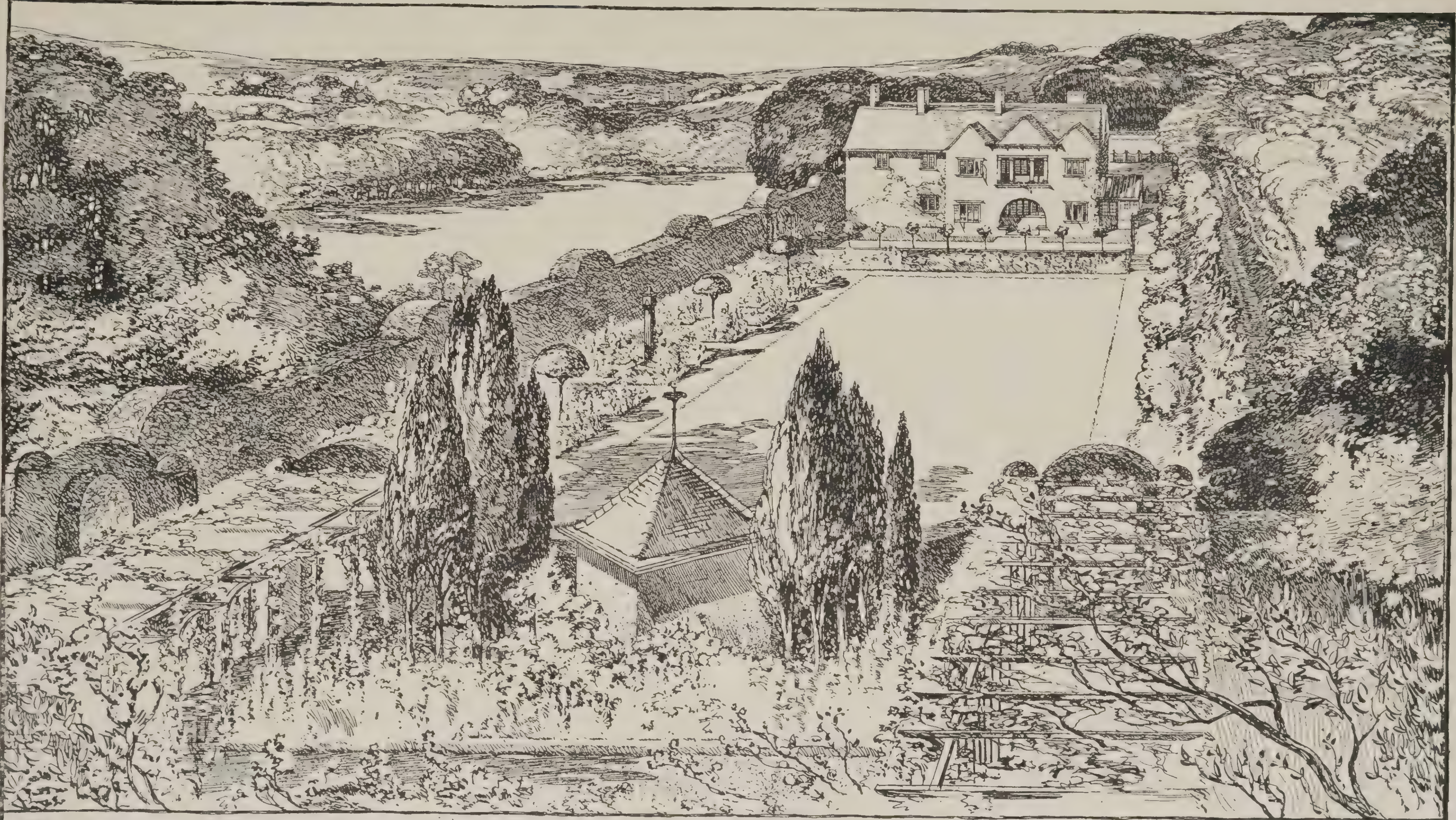

HOVSE & GARDENS AT BERKHAMPSTEAD FOR S.R. TIMSON ESQ. GARDENS BY T.H. MAWSON, HOVSE BY DAN GIBSON

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Bricks and Mortar.

APHORISM FOR THE WEEK.

Architecture (as all the other Arts) being grounded upon rules taken from the imitation of Nature, admits of nothing that is contrary or foreign to that Order which Nature has prescribed to all things. . . . Although variety and novelty should please all, yet we are not to go against the precepts of Art and that which reason demonstrates.—PALLADIO.

Our Plates. THE entrance doorway to 74, Cheyne Walk, Chelsea, designed by Mr. C. R. Ashbee, M.A., and executed by the Guild of Handicraft, Essex House, Bow, is of deal with flush panels, the lower portion being covered with copper sheeting with a floral design in repoussé of a white pink, which, by the way, is the emblem of the Guild. The front elevation of this house, which has been carried out in stock bricks and rough-cast, appeared as a plate in our issue for June 13th, 1900. Our illustration is from a pen drawing by Mr. Sydney Newcombe.—The house for Mr. S. R. Timson is situated at the top of a steep ascent near the village of Berkhampstead known as White Hill, and embraces fine views of the surrounding well-timbered district. Both house and garden are designed in companionship and as neighbours to the Hertfordshire house and garden shown by Mr. Mallow's illustration in "The Art and Craft of Garden Making." Our illustration also forms part of the second edition of this work, which has been enlarged and revised and is now being re-issued by the publishers, Mr. Batsford and Messrs. Newnes & Co. The house is from designs by Mr. Dan Gibson, of Windermere, the materials employed being those which are those traditionally employed in the district, brown tile roof and rough-cast, rendered and carried out by Messrs. H. & J. Matthews, contractors, of Berkhampstead. The plan of house and grounds was given on p. 92 of our issue for March 13th last. In the disposal of the ground Mr. Thomas H. Mawson's object was to secure as much as possible for garden and pleasure ground, the main building, supplementary buildings and offices being arranged to partially enclose a square carriage court, entered from the road immediately through gates without any intervening drive. Bordering on, but screened from the carriage court by a high climber-covered trellis, is a separate path for tradesmen, entered by a separate gate. A full-sized tennis lawn claims the major portion of the remaining ground, the strip of ground between it and the impenetrable boundary hedge of holly being utilized for flower beds to brighten the prospect, box edged—accompanied by a reposeful sun dial. A square (not octagon) summer house, rough-cast, is set angle on to the tennis lawn. Select clipped trees of simple form and a quiet, restful green colour, a sparing but select assortment of shrubs for flower in summer and evergreen to furnish in winter, and roses and climbers wherever a suitable footing can be found to embower the house, aided by the kindly rough-cast trellis, pergolas, arches and hedges well-nigh complete the remainder.

An Early Building Indenture. THE following is reckoned to be the earliest known document relating to the erection of a house in this country, dating as it does from 1472: "This indenture made between Alice Chester, of Bristol, widow, some time the wife of Harry Chester, of Bristol, draper, on the one party, and Stephen Morgan, of Bristol, carpenter, on the other party, witnesseth that the said Stephen hath covenanted with the same Alice and him bindeth by these presents to make well, workmanly, and surely of good timber and boards a new house, in the High Street of Bristol, with floors, windows, doors, and partitions and all other things of timber work belonging to the same house, except laths and lattices, which said new house shall be set between the tenement called the Bull on the one party, and the tenement in which one Jone a Cork, Corviser (cordwainder or shoemaker), now dwelleth in, on the other party, containing in length 19 feet and 5 inches of size, and in wideness 10 feet and 4 inches; and the said Stephen shall make in the said a shop, a hall above the same, with an oriel (bay window), a chamber above the hall with an oriel, and another chamber above that by the feast of the Annunciation of our Lady next coming, for which house so to be made by the same Stephen the said Alice granteth, and her bindeth by this present (writing) to pay unto the said Stephen £6 18s. 4d. sterling; that is to say, at the feast of the Nativity of our Lord next coming £3, at flooring of the said house 33s. 4d., and at the end of the same work 40s. Also, it is accorded, that it shall be lawful to the same Stephen to have and take as his own all the old timber of the said old house without any gain-saying of the same Alice, or any other for her, or in her name. In witness, thereof, the parties aforesaid to these indentures interchangeably have set their seals. Given the 17th day of the month of November, in the 12th year of the reign of King Edward IV.—Hardyng."

The Cretan Excavations. MR. ARTHUR EVANS announces that the concluding excavations of this season in the prehistoric palace of Knossos have produced discoveries which throw an entirely new light on the architecture of Homeric Greece. East of the great central court he has now brought to light a suite of princely chambers with walls descending in places 20ft. and including the remains of upper storeys. A portico to the east opens on a fore-hall with eleven doorways and giving access to the principal hall. A side passage leads from this to a second hall, which shows on two sides the remains of a double tier of colonnades, within which a triple staircase leads to the upper galleries. In this hall was a large deposit of tablets with prehistoric inscriptions, one larger than any yet discovered, and apparently containing lists of officials. In the neighbouring chamber were fallen fragments of human figures of coloured plaster in high relief and of most magnificent execution, the rendering of veins and muscles showing a naturalistic skill never again rivalled till the Italian Renaissance. In the adjoining gallery were remains of bull-hunting scenes, in which girls, attired like Mycenæan cowboys, also take part.

Kirkham Priory. THE members of the York Architectural Society recently visited Kirkham Priory. A paper on the history and architectural features of the Priory was read by the president, Mr. C. H. Channon, F.R.I.B.A. A paper on the heraldry on the gateway prepared by Lord Hawkesbury was read by the secretary, Mr. George Benson, A.R.I.B.A. The Priory was founded in 1121 by Sir Walter Espec and his wife Adeline for canons regular of the Order of St. Augustine and in honour of the Holy Trinity. The Priory church was cruciform, having an aisleless nave, transepts with chapels, central tower and square-ended choir with aisles. South of the nave was the cloister, round which the Priory buildings were grouped. The south wall of the cloister contains a beautiful late Norman enriched doorway, leading to the refectory. Of the choir, a single lancet remains at the east end, with side shafts and capitals of foliage. The designer has impressed his individuality on the lancet window; it differs from other work, but has a quiet dignity of its own. About 1290 the Norman gatehouse had a decorated design grafted on it; the tracery in the two windows is fine. Heraldry plays an important part in the decoration of the gatehouse front; the shields are those of Clare, Plantagenet, Ros, Vaux, Fitzwilliam, Scrope and Vesci. About this period the lavatory in the cloister was inserted; it is a beautiful composition of geometrical decorated work. A visit was afterwards paid to Crambe Church, an edifice with a Pre-Norman chancel arch, Norman windows in nave and chancel, and an interesting Norman font, and to the modern church of Whitwell.

Excavations at Silchester. THE exhibition of antiquities found at Silchester during the course of last year was open to the public last week at the rooms of the Society of Antiquaries, Burlington House. The collection was certainly one of the most interesting which has been acquired since the present committee took over the work in 1890. Last year's excavations were confined to four of the insulæ into which the area has been divided, numbered 23 to 26. Insula 23 formed the northernmost of the unusually large squares in the central portion of the town. Here the late Rev. J. G. Joyce unearthed a house of considerable size so long ago as 1865. Later research has revealed an additional series of chambers to the north-east, which evidently formed part of the same dwelling. Another house of large size with several mosaic pavements was also uncovered on the east side of the insula, and in the mouth of its courtyard was a small square building which was probably devoted to sacred purposes. This had been raised round a small and earlier structure of the same character. The pits and wells in the immediate locality were unusually productive in pottery, and included a hoard of smiths' and other iron tools numerically larger than the famous find of 1890. In insula 24 were found two houses, one of which was not only large but of exceptional interest owing to the peculiarity of its plan and its numerous mosaic floors. Other buildings encountered by the excavators near the north gate were apparently connected with dye-works; while in insula 26 the late Mr. Joyce's work was again supplemented by the discovery of the complete plan of a house partially revealed by his industry. The same area contained three other structures, of which one was represented by a solid circular platform with a cement floor 27ft. in diameter. This seems to have been enclosed by woodwork or half-timbering. The whole collection will eventually be placed for arrangement in the architectural room in the Reading Museum.

Houses Built of Glass. THE following are extracts from an article on glass houses which recently appeared in the "Spectator": We suppose there is something of the advertisement in the descriptions we see of the new "stone glass," which, according to M. Henrivaux, the great French glass-maker, is to supersede brick for building, but the idea has a certain charm in it nevertheless. It fascinated Mr. Percy Greg thirty years ago; and in that remarkable effort of imagination, "Across the Zodiac," the grandees of Mars all live in indestructible houses of glass, translucent from within, yet impervious to the eye which gazes from the outside. There are objections to the material, as we shall presently show, but that it can be made exceedingly durable, harder than stone, and of every variety of colour, we are willing to believe. . . . If there is a Beckford among the millionaires now so numerous among us, we recommend the idea to him, with the proviso that his architecture must not be Gothic, and Arab rather than Italian. The material is for the Alhambra, not for a Christian minster. He would have a house unlike any other in the world, that would continue to exist, unless artillery were used against it, as long as the Egyptian vitrified ornaments, or say four thousand years as a minimum, and which in all that while would be, or at all events might be, a miracle of cleanliness, the only detergent needed being soap and water rather lavishly expended. Its rooms might be of marvellous variety, and in one way of beauty, the material admitting of every perfection of Arabesque design, and even of reliefs to which skilfully localised opacity would yield the necessary shading. . . . Open windows being needless and ventilation secured from above, the house could be embosomed in a grove of trees far closer to it than our customary architecture will allow. . . . It would be an experiment worth making if one had, say, £20,000 to throw away; and who nowadays of the new palace-builders would miss so insignificant an amount? A fifth-rate New Yorker would waste it on his staircase. . . . Except for an experiment, however, we distrust glass as a building material for the general housing of a community. We doubt the growth of a desire for an unvarying pressure of light or of a wish for the feeling that we are always out of doors. Nor do we fancy that glass can ever be very cheap. Its substance may no doubt be—for instance, glass could be made from sea-sand—but vitrifaction requires intense heat, and intense heat is costly to produce, while if the material is no cheaper we do not see its superiority either to stone or good brick.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Opaque Blinds.

Manchester.—Old Subscriber writes: "Kindly name the makers of opaque material for window blinds. It is used for putting rooms in total darkness."

Messrs. Guynan & Son, of 11, Carburton Street, Great Portland Street, London, W., make a speciality of opaque spring-roller blinds in various styles for lecture-rooms, studios, laboratories, &c. They will, doubtless, be willing to supply the material alone if required.

Books on Chimney Construction.

Beeston, Notts.—T. C. C. writes: "Is there any book dealing with tall chimney construction, giving more particularly the size of the flue required for, say, from one to six boilers, and also the height necessary?"

"Boiler and Factory Chimneys: Their Draught Power and Stability," by R. Wilson (3s.), and "Chimney Design and Theory," by W. W. Christie (12s. 6d. nett), will be found useful. They can be obtained from Mr. B. T. Bastford, of 94, High Holborn, W.C. We have an article in hand on "The Practice of Stalk Building and Boiler Setting," which will be published shortly.

Floor for Small Fever Hospital.

Bath.—V. S. writes: "Can you suggest an inexpensive and efficient floor for a small fever hospital, terrazzo, oak and teak being too expensive?"

It is difficult to suggest a cheap and effective substitute, but trowelled cement might be used for the corridors, and concrete made of Portland cement and cork dust used for the floors, being sanitary, cheap, warm and soft to the feet.

Papering Walls.

Southsea.—W. A. C. writes: "Which is the most satisfactory and economical means to prevent the first papers fixed to walls (new) from being affected by the lime?"

Plaster should, whenever possible, be allowed to dry thoroughly, and in good work is generally distempered and left in that state for about six or twelve months before papering. If, however, this cannot he done, for cheap work a coat of spirit varnish, paper coated with pitch, or lining paper may be first put on; one ply Willesden paper is more satisfactory, and for first-class work tin foil should be used. Sulphuric acid has been recommended for drying plaster, but it renders the surface liable to considerable decay.

Nailing Floor to Concrete.

York.—Floor writes: "I am thinking of nailing down a wood floor to concrete direct. It is more solid and sanitary than nailing to fillets. Does experience show that there is danger of dry rot? Wood block flooring seems to stand so far as this danger is concerned."

Wood flooring should not be nailed down direct to the concrete, as there is a danger of rot setting in. This is more especially the case in cellars, and where the floors are often damp. The case of wood-block flooring is entirely different, being in small pieces, mostly laid on end, and tarred on the underside. We would suggest that the concrete be trowelled off with neat cement and tarred, and the underside of the boards tarred also. The floor should not be covered with linoleum or a similar non-porous substance.

Hollow Walls for House in South of England.

London, W.—R. G. B. writes: "I am building a house a few miles from Bournemouth, and the prevailing custom appears to be to build 11in. hollow walls. Would a 9in. solid wall with 1in. cement rendering and rough-cast or pebble dash keep the walls dry, and, if so, which of these is the best? The house is detached, but not exceptionally exposed."

In the South of England, where the usual stock bricks are so porous, the custom of building hollow external walls is very general. I have built a great many cottages with 11in. cavity walls with either iron ties or with Jennings' patent binding bricks, and consider the latter the better of the two. It is very necessary that the two 4½in. thicknesses should be carried on the same foundation, and they should he finished at the extreme top with a little solid brickwork in order that the roof may be carried equally on both. An article on this method of walling, detailing the necessary precautions which should be taken, is to be found in the Builders' Journal for January 16th, 1901, and reference may profitably be made to it. There is no doubt that an 11in. cavity wall with ties is of less strength than one of 9in. solid work, and a greatly better construction consists of a 4½in. outer skin, 2in. cavity and a 9in. interior wall carrying the floors and roof timbers. If, however, this method of building be considered too expensive there is no doubt that a 9in. solid wall covered with cement rendering or with rough-cast can be made absolutely waterproof, but to some minds its appearance is rather a drawback. If this plan be adopted small staples should be inserted for the attachment of wires if creepers or roses are to be trained upon the walls. The pebbles referred to are merely a matter of taste, and form no part of the waterproofing construction. G. S. M.

Books on Workmen's Houses.

Liverpool.—H. W. writes: "Kindly name some books (with plans, &c.) on the building of small houses for workmen with six to ten rooms."

The following will be useful: "Houses for the Working Classes in Urban Districts," by S. W. Cranfield and H. I. Potter (15s. nett); "The Principles and Practice of Modern House Construction," edited by G. Lister Sutcliffe (published by the Gresham Publishing Company, 25, Farringdon Avenue, E.C.); "Examples of Labourers' Cottages, &c.," by J. Birch (7s.); "Dwellings for the Poor," by T. L. Worthington (2s. 6d.); "Cottages," by A. W. Brunner (4s. 6d. nett). Any of these can be obtained from Mr. B. T. Batsford, 24, High Holborn, W.C.

Civil Service Examinations.

Cockney writes: "Kindly answer the following questions: (1) If I write for particulars and application forms for Civil Service Examinations when they are announced, can the Commissioners compel me to go in for that examination and pay the fee? (2) Can an assistant surveyor R.E. enter for the examinations for assistant surveyor in the Office of Works, which seems a better post, and if he passes be transferred? (3) Do assistant surveyors in the Royal Engineers wear uniform, and are they considered officers? (4) What are the best ways for learning architectural design?"

(1) No. (2) Yes. (3) No. (4) See answer to enquiry on architectural training on p. 346 of our issue for June 5th last.

Waltham Abbey.

London, N.—Waltham Cross writes: "Kindly give the titles of any books relating to Waltham Abbey, particularly relating to the Lady Chapel."

A paper on the "Architecture and Early History of Waltham Abbey Church," by E. A. Freeman, appeared in Vol. ii. of the Transactions of the Essex Archæological Society. Then there are Fuller's "History of Waltham Abbey" and Stubb's "Foundation of Waltham Abbey."

Experience in a Country Architect's Office.

Pro Bono Publico writes: "What is your opinion of a county architect and surveyor's office for a young man wishing to gain an architectural and surveying experience—London not included, of course?"

As a general rule a student can gain more experience in a country than in a London office, but very much depends upon the principal, the district, and the class of his practice. This is usually more varied than in town, and there are greater opportunities of inspecting works in progress, but, on the other hand, the designing is often of a low order, and the opportunities of private study are few. This last drawback however, can be remedied by becoming a "student" of the Society of Architects and entering for the students' competitions, or by working for the R.I.B.A. examinations, taking correspondence tuition from someone who undertakes this work.

Brick Clays.

Queenstown, South Africa.—Builder writes: "Kindly recommend some books dealing with the treatment of clay for brickmaking, also for brickmaking machinery."

"Bricks, Tiles and Terra-Cotta," by C. T. Davis (21s.), to be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C. Particulars of the various kinds of brickmaking machines will be found in "Architectural Pottery," a very comprehensive work recently published by Messrs. Scott, Greenwood & Co., 19, Ludgate Hill, E.C., price 15s. nett.

Books on Colonial Architecture.

Lux writes: "What is the best book on Colonial architecture or building construction?"

We are not quite clear as to what querist wants—whether a book giving illustrations of current architecture in the Colonies, or a book dealing only with their construction. As regards the former, we know of no book on the subject; but an illustrated article on "Architectural Art in New Zealand," by Mr. S. Hurst Seager, A.R.I.B.A., which appeared in the R.I.B.A. Journal for September 29th, 1900, may be useful; and, perhaps, "Old Colonial Houses at the Cape" (Batsford) may also be of use. The ordinary books on building construction will be suitable for Colonial work. Rivington's "Building Construction" (4 vols.) should be obtained; and other useful books are Clarke's "Farm Buildings" (6s. nett) and Giraud's "Stable Building and Stable Fitting" (6s). These can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Renaissance Buildings in Worcestershire.

London, N.W.—P. T. H. writes: "Kindly name two or three Renaissance buildings in Worcestershire, or adjoining counties, suitable to measure for the R.I.B.A. Final Examination."

The Guildhall at Worcester would seem to answer the description best. It was built in 1723. Westwood House, Worcestershire, also might serve the purpose. The main block is Elizabethan, and it has a splendid porch, but the wings are commonplace and the interior has to a great extent been modernised. G. A. T. M.

Assistant Surveyors, Civil Service.

London, S.W.—M. A. J. C. writes: "I am in a surveyor and estate agent's office and hope in a few years to either start for myself or enter the Civil Service as an assistant surveyor. What course should I take in order to obtain such a position?"

Particulars of the Civil Service examinations can be obtained by applying to the Secretary, Civil Service Commission, London, S.W. Some useful and interesting correspondence and an article on the Civil Service examinations appeared in our issues for November 22nd, 1899, May 16th and 30th 1900.

Payments to Adjoining Owners.

London, E.C.—J. W. R. writes: "I am obliged for the reply to my query on page 345 of your issue for June 5th relative to the rebuilding of a party wall. Could you name the case in question?"

The case is *Irving* v. *Turnbull* 2, Q. B. (1900) 129. The decision was made by reason of the terms of the conveyances under which the respective parties derive their title. A. O. H.

Preventing Paint Blistering.

Boiled Oil writes: "Could you recommend a dark-green paint for woodwork much exposed to the sun? I have tried several, but find all of them blister."

Dark-green paint, in order that it may not blister, must be composed of hard drying varnish and turpentine, and afterwards varnished with a carriage varnish. Ordinary oil paint will probably blister if the work on which it is used has blistered before. The fault has been in the original painting. For full particulars as to the prevention of blisters, see "Painting and Decorating" (Griffin & Co.). W. J. P.

R. I. B. A.

EDUCATION IN BUILDING.

By Professor W. R. LETHABY.

A MEETING of the Royal Institute of British Architects was held last Monday evening at No. 9, Conduit Street, W., Mr. William Emerson, president, being in the chair. The minutes of the previous meeting having been confirmed, Mr. Alexander Graham, hon. secretary, announced the death of Mr. J. A. Inglis, which is referred to in another column. Mr. Charles J. Sculthorpe Hall, Professor of Architecture to the State College, Puebla, Mexico, was then elected a fellow of the Institute. Mr. Emerson announced that the appeal for funds at the annual meeting of the Architects' Benevolent Fund, when Mr. Macvicar Anderson had offered £100, if £1,000 would be made up, had been successful in obtaining that sum.

Professor W. R. Lethaby then read his paper on "Education in Building." He began by referring to what is usually meant by the word "architecture." He said it was very ambiguous, meaning anything and nothing, according to the varying conditions of the moment. It meant either actual building, drawing, &c. "Architect" was also another ambiguous word; it was almost one of the words which philologists might call a myth-making word. It was also the same with "science," "civilization," "progress" and "liberty." The word "architect" was very unfrequently found used in the Middle Ages, meaning a master in craft. The early craftsmen were associated in guilds, and the words used instead of architect were usually mason or carpenter, but above all it always referred to the doing of work. We found such expressions used as "the *work* at St. Paul's," or "at London Bridge." Considerable study had been made in France of contemporary documents dealing with the builders of the great churches and cathedrals there, but in this country very little was known, yet one could say with certainty who was the master of works in their erection. The facts laid ready at hand for those who were willing to investigate with regard to our cathedrals. We went on reading and hearing it stated that it was not known who built this old building and that, but the facts were at hand. When the old documents were studied, first carpenters and masons were referred to as the master craftsmen, and then later masons and carpenters. In the guilds a craftsman first entered as an apprentice and after seven years, supposing he were qualified, he was entered as a master. The freedom of the City of London was originally merely the natural right of every craftsman. Masterhood was a definite degree in craftsmanship, just as a master, such as of arts or letters, in a university, and ranked equal. The fact of the guild organisation was the great fact of the Middle Ages. The country was subject to the barons and nobles, but the towns were on the craft guild basis. In the twelfth century there was a great struggle between these two sides. Industry was early organised into groups. Mr. Lethaby thought that the modern use of the word "master" was a mere derivation of the early use, in that only a master in a guild could be the employer of labour. The guilds claimed a notable place in civic life. We could now hardly realize, any of us, the airs a craftsman gave himself. If we wanted to build a shop we called in a carpenter, or for church a mason; so, then, the carpenters attended to houses and masons occupied chief place in churches. Probably abbots and lords often laid down very carefully the requirements of their buildings. The design was merely the professing and doing of the work in the ordinary way.

It was probable that there had been a succession of masons in charge of Westminster Abbey right down to the present day, since Henry III. began to build it. As there were special officers of the King, so in the guild days there were a King's mason, a King's baker, &c. He spoke merely of normal conditions; there were of course exceptions. The guild was a co-ordinating authority, and there was no art nonsense. The building of old work was a natural evolutionary product. He had been investigating the documents dealing with the builders of Westminster Abbey, and he gave some of the results of his researches. He found the term master mason in use in the twelfth century, implying the existence of a guild. In 1244 he found that preparations were being made for the rebuilding of Westminster Abbey by Henry III., and a Henry as master mason was mentioned. This Henry almost certainly became the first master of Westminster. He next found that the materials were consigned to Edward the clerk, who doubtless had to deal with the finance, and a master of the works. In 1246, Master Henry Seminarius took a house at Westminster, and he and Edward, the clerk were mentioned as keepers of the work. Their wages are stated later, and 600 or 800 men were ordered by the King to be put on to urge on the work. Later, a mandate was issued to Henry, the master mason, to expedite the work. John of Gloucester was appointed his successor, and as King's mason in another mandate. Mention is also made of a master carpenter. In 1260 this great mason died and was succeeded by Master Robert of Beverley. Robert was employed in erecting a stage for Edward I., and completed the Tower of London and the King's Mews at Charing. We learn that 1,000 to 2,000 marks—an enormous sum in those days—was being spent annually upon the work at Westminster. In 1279 Robert was still keeper of the works. Robert was succeeded by Richard Crundall, as chief mason. Then we read of Walter of Canterbury, Richard Witham, Thomas of Canterbury, William de Ramsay, &c., up to the time of the Black Death.

Everywhere the art of building was developed by men engaged in actual building. It might not be possible to bring back this sort of thing—perhaps it was not desirable. The modern system was marked everywhere in building, and we had a garbage of diseased ornamentation of fatty luxury, which he might call the "Syndicate" style. It was, perhaps, necessary that in the study of past art the different forms should have been labelled styles, but it was truer to say that there was only one style—the art of experiment, of expressing on work thought. That was the measure and value of our work to-day. Then let us consider the future in the light of the past. Were we to aim again at reproduction of some forms of a past architecture, such as those of Mexico, which had not yet been imitated or, something more easy, as the methods and mannerisms of Wren? They could do no such things. The attempt could only be made by an architectural ostrich with his head in the sand. What was there else but the art of building in the practical work of to-day and in the scientific study of to-day?

Archæology was only a branch of history. Proportion was the outcome of a right use of material, as a North Western Railway engine was proportioned to its driver, and no one knew anything else. Taste and principles in design no one had. Beauty, that subtle and illusive science which spoke to our spirits, they could not formulate; in art it was the evidence of a balance of quantities and method. Work was certainly a serious part of life, and we might say beauty was the smile of energy. It was work the effort they had to teach, and not the smile—that would come of itself. Nothing wise or beautiful could but spring from this. Want of knowledge had been prescribed as a remedy, but he thought against the blankness of ignorance it would be better to have knowledge. To give up all and carry the hod would be the part of a saint in architecture.

There were many ways to help to better the state of things—such as in the sacrifice of ornament, by spending more time at the work and less at the office, &c. They might learn much about building by questioning the workmen, who knew many things, of methods they had seen. We were living through a period of quick change in these things, and probably the most valuable work that could be done would be gathering these old receipts in building. Those rough, tired men the British workmen were, after all, the true architects. It was they who knew how much water should be in a mortar when worked up with the trowel, how many nails went to each slate. It was they, and they only, who knew what was proper; and he always felt ashamed when he called a building his.

The trade unions in a much narrowed form represented the old guilds, and no real improvement would be made until they took them over and placed the teaching in the hands of the men themselves. Even at this moment the plasterers of London were endeavouring to make every learner go through the technical schools already established. The quality of work done rested in the long run on the economic basis. The art of bygone days was the work of great artists in feudalism; the art of the monasteries was the flowing out of illuminated books, glass, &c.—but generally there was peace in work.

It was often stated that the breeze of art blew where it listed, that there was no governing principle, and that it grew up both in oppression and in freedom, but that was not so. Wherever labour was honoured, there art would be found, for honourable labour was art. That proposition stood. Labour was really employed by the work and not by the agent. They must learn by practical work, and he would have schools established where all the building crafts could be practised side by side. In that school the science of mechanics should be taught, with practical methods and materials tested. Planning he would have taught, and normal types of plan; and also negative taste should be formed, that was the critical taste, but not the art of design or talk of styles allowed. The question of education in building must meet all classes of men engaged in building. Some day pleasant, natural work would be founded on common building; it could stand on nothing else.

Mr. Paul Waterhouse, in proposing a vote of thanks to Prof. Lethaby, said the paper had been a lesson for all of them. Whenever he saw a man approaching the Middle Ages he had fears that the veil was about to be lifted. But Mr. Lethaby had still left some mystery. He had shown how successful that system was. The architect had been knocked out as he had been before, but there still seemed a doubt as to who designed those things. To superintend was one thing, and to design was another thing. They were face to face with the conclusion that the buildings of the Middle Ages conducted themselves. It brought out the great contrast of our architecture of to-day and of that. They felt that it was impossible to revive those successful conditions of the Middle Ages with the trade unions. In Gardiner's "Dunwich" there was a form of contract quoted for the building of a church which showed that it was to be copied in general from the buildings in the neighbourhood, showing that the striving for originality was not their aim.

Mr. Beresford Pite, in seconding the motion, thought that mediæval architecture evolved itself step by step was a fairly self-evident proposition, and in its ordinary or ordinated course room was not found for the architect as we conceived him. To examine in the art of architecture was scarcely possible. The Institute examined Associates in design, but in the class of Fellows they did not. He thought the time had come for the sound sanity of the policy to be applied to the Associate examination as well as to the Fellowship, and he would suggest a modification.

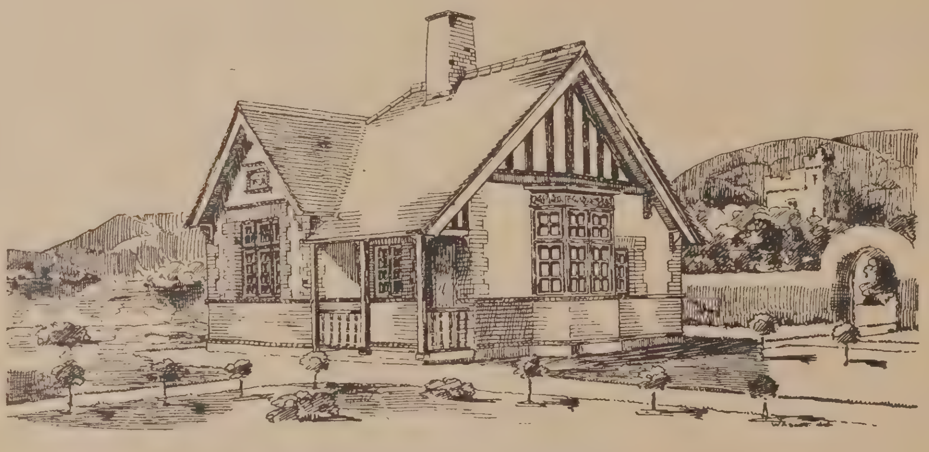
Messrs. Leonard Stokes, Thomas Blashill and F. Batchelor also spoke. Mr. Emerson, in putting the vote of thanks, said the same system Mr. Lethaby had referred to as in the Middle Ages appertained in India to-day, the master mason preparing no design for even very large buildings. The vote having been accorded, Professor Lethaby, in acknowledging, said some of the speakers had spoken of the master mason as a common man, but the whole meaning of mediæval art was that a man could rise to be the equal of any in the realm.

The New Wesleyan Church at St. Leonards has been erected in Norman Road. The old chapel it will be remembered, was destroyed by fire. The new building is of white stone, with intermediate local blue stone, and is of handsome appearance, the spire being 90ft. in height. The interior arches are also of white stone, the columns of red Peterhead granite, and the walls of Suffolk white bricks, relieved with red local bricks. Four steps lead up the rostrum, which is of pitch-pine ornamented with roses of sycamore. Electric light and gas illuminate the chapel. The building will probably cost £5,500. Mr. Clayton was architect, and Mr. W. J. Morgan builder.

Law Cases.

Mortar made with Mud.—At the South-Western Police Court recently Elijah Hedges, builder, Manor Road, South Norwood, was fined £5 and ordered to pay one guinea costs for constructing walls of houses in New Clive Road with mortar composed of 44 per cent. of sand, 26 per cent. of lime and 30 per cent. of mud. There were road sweepings, dustbin refuse, and dirty ashes in it.

Fined for Building Walls too Thin.—At the Colwyn Bay Petty Sessions, Owen Lloyd, builder, was summoned for offences against the building by-laws. Mr. William Jones, C.E., surveyor to the Colwyn Bay Urban District Council, said the defendant submitted plans for six houses three storeys high. He built four of them in accordance with the plans, but in the last two, instead of making a 13½in. wall to the level of the third floor, it was only 9½in., which would save him using 5,000 or 6,000 bricks. The foundations, therefore, were not sufficient for the superstructure, and the stability of the building was imperilled. In the other case defendant added an additional storey not shown on the plans. The bench imposed the maximum penalty in each case, £5 and costs, amounting altogether to £11 16s.



GATE LODGE AT BEAUPARC, CO. MEATH. ANTHONY SCOTT AND SON, Architects.

Reasonable Wear and Tear": A Dilapidation Case.—The case of *Terrell* v. *Murray* was recently heard in the King's Bench Division of the High Court of Justice. This was a motion to set aside the judgment of Mr. Hemming, K.C., the official referee, in an action brought by Mr. A'Beckett Terrell, the plaintiff, against Lady Murray, the defendant, to recover a sum of money alleged to be due in respect of dilapidations under a seven years' lease of 20, Harcourt Terrace, South Kensington. There was no covenant to repair during the term, but the tenant covenanted as follows: "To deliver up at the expiration or sooner determination of the said term the messuage with all fixtures attached thereto in as good repair and condition as it now is in, reasonable wear and tear and damage by fire excepted." At the expiration of the term the plaintiff made a claim for £112 under the above covenant. He brought the present action to recover this amount, and the action was subsequently referred to the official referee. The official referee found that the sum of £39 was due from the defendant. In this sum was included £12 for painting the outside of the building, £2 for repointing certain brickwork, and £5 for repairing parts of the kitchen floor which had become affected by dry rot. The official referee held that the fact that the mischief which necessitated the above items of repair had arisen through lapse of time did not excuse the defendant from executing the repairs. After hearing the arguments of counsel, the Court gave judgment for the defendant. Mr. Justice Bruce said that it was a little curious that there was no very satisfactory authority as to the meaning of the words "fair or reasonable wear and tear." He could not agree that no meaning ought to be given to the words at all, nor could he agree that they had no operation in regard to the outside of the premises. The meaning of the covenant in his opinion was that the tenant was bound at the end of the tenancy to deliver up the premises in as good condition as they were in at the beginning; subject to the following exceptions, that was to say, dilapidations caused by the friction of the air, dilapidations caused by exposure, and dilapidations caused by ordinary use. As he was of opinion that outside painting was not a thing the tenant was bound to do under that covenant, and as the amount due to the plaintiff would thus be reduced to the amount paid into Court, he gave judgment for the defendant. Mr. Justice Phillimore felt some difficulty, but on the whole concurred.

Building Contracts: Extension of Time.—In the King's Bench Divisional Court Mr. Justice Bruce and Mr. Justice Phillimore recently gave judgment in the case of *Sattin and another* v. *Poole*, in which the plaintiffs sought to set aside a report and a judgment founded upon it of Mr. Verey, the official referee, in an arbitration between the parties. The plaintiffs were Mr. Joseph Sattin and Mr. Herbert Evershed, co-partners, who carry on business in Brighton as builders and contractors. The defendant was Mr. G. T. Poole, the owner of the St. James's Restaurant, Brighton. Plaintiffs had contracted to re-build the defendant's house, the contract between the parties being governed by the usual conditions as to a time-limit with regard to the completion of the works; a right given to the owner's architect (Mr. Clayton Botham) to grant "reasonable" extensions of time in the event of the work not being completed within the time specified; and a power of imposing a penalty of £12 per week for the period during which the work should remain incomplete after the time specified in the contract, or after any extension that should be certified by the architect. This penalty the owner had a right to deduct from any balance remaining due to the builder for work and labour done. The defendant paid in respect to the work done, the architect having given progressive certificates, leaving a balance of £681 due. In respect to that amount he claimed £231 by way of penalties on the certificate of the architect that the work could have been reasonably completed in the extended time, which expired on September 20th, 1899. The defendant paid £450 into Court in satisfaction of the balance, and the case went before the official referee upon the point as to whether the penalties could be deducted under Clause 24 of the contract. The official referee, according to the plaintiff's case, refused to hear the evidence offered on the part of the plaintiffs to show that the delay was caused by the owner or by his architect in ordering extras, in supplying material after the specified date, in delay in the selection of the stone to be used, and in the alteration of plans, and he found for the defendants on the architect's certificate. Two of the chief points raised by the plaintiffs in their appeal were that the architect could not properly be judge in his own cause, as it was contended he was, and the allegation that he was himself responsible for the delay, and yet had certified as to the work not having been completed within "reasonable time." Mr. Justice Phillimore, in giving judgment, said that certificates were given according to a common practice, and were not conclusive as to the scheme in respect of which they were granted. They were only conclusive in so far as saying that at some time or other the builder might be entitled to his claim under his contract. The other matters raised by the case turned upon the agreement under the contract. The works were to be completed by May 20th, but, by one of the clauses, the architect had power to extend the time, and the architect had certified that the work was not done within a reasonable time. His lordship thought that the judgment of the official referee was right, and therefore the sum of £450 paid into Court was the proper sum due. Mr. Justice Bruce agreed, and judgment was given accordingly.

County Antrim Asylum: The Contractors' Claim.—On June 11th, before the Lord Chief Justice and a common jury, the case of *H. & J. Martin, Ltd.* v. *County Antrim County Council* was heard. This was an action for £4,167 2s. 1d. for balance of work done by the plaintiffs as contractors in building a new asylum for County Antrim. The contract was made with the Commissioners for Asylums in 1895, and since then the works have been proceeding, and possession was taken by the county council (the successors in title of the Commissioners) in April, 1900. The total amount of the contract exceeded £60,000. By two certificates granted in November, 1900, the plaintiffs were entitled to two several sums of £2,000 and £165, those being the two last certificates of the architects. In November, 1900, submission to arbitration was made between the parties, and an award was made by which the plaintiffs were declared entitled to £1,900. The present claim was made in respect of the three sums named. The Lord Chief Justice entered judgment for the plaintiffs for the sum of £4,175, the plaintiffs agreeing to give a stay to the defendants till August 1st.

DESIGN FOR GATE LODGE.

THE illustration on this page is an alternative design for a gate lodge for Mr. Peter Austin, J.P., C.C., of Beechville, Beauparc, co. Meath, erected at his Slanduff residence in the same county. Slanduff (Dark Valley) is situated in one of the most beautifully wooded and picturesque valleys in the heart of the rich and fertile county of Meath, under the shadow of the ruins of that once formidable keep, Walterstown Castle, now fast crumbling into ruins, and in view of the world-famed Hill of Tara, once the seat of the high kings of Ireland—where all Ireland's provincial kings were crowned—the original sanctuary of the "Lea Fail," or Stone of Destiny, now to be seen under the Coronation Chair in Westminster Abbey. Messrs. Anthony Scott & Son, A.R.I.B.A., M.R.I.A.I., of Drogheda and Navan, were the architects.

NEW CHURCH AT ULVERSTON.

A NEW Wesleyan Church at Ulverston has been opened recently. It occupies a site at the junction of five roads—Neville Street both ways, Hartley Street, and Chapel Street both ways, and is a conspicuous landmark from each. It is built of limestone, with Yorkshire stone dressings. The design is the Early Gothic style, with Transitional front windows of geometrical tracery. The tower is 11ft. 4in. square, and terminates with a spire at a total height of 85ft. The plan is cruciform, with nave, transepts, and chancel, the latter occupied by the choir. The organ chamber is fixed at the side of the chancel, and arched off from the chancel and nave. There is a gallery at one end. The windows throughout are glazed with leaded cathedral glass. In the chancel is a memorial window. The roof is partially open, with arched timbers and a pitch-pine ceiling, and is of good acoustic properties, being constructed after precedents which the architect has found excellent in this respect. The pews also are of pitch-pine, and the church will seat 512 adults, or a mixed congregation of 675; and the cost is £4,150, exclusive of architect's fees and site, which, with the organ, brings the total cost to about £5,300. Mr. John Wills, F.S.Sc., of Derby and London, was the architect, and Mr. W. Waite, of Ulverston, the contractor.

Correspondence.

Examinations in Building Construction.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I have read with pleasure the number of protests against the manner in which the questions were set at the building construction examination held on May 11th. In question 69, Division III., we are asked to design double labourers' dwellings for a rural district, showing all necessary conveniences and the enclosure; also to take out accurate quantities and price them—and this as one question of five in four hours! Would any quantity surveyor take out the quantities and price them for less than £5? We are asked to do it in twenty-four minutes. There were five questions on design in Division III. What I ask is that these, and quantities, should be left for other examinations.—Yours truly, A STUDENT SALFORD TECHNICAL INSTITUTE.

New Patents.

These patents are open to opposition until July 22nd.

1900.—Transporting Timber.—12,663. G. BRISTOW, Bentinck Saw Mills, Lynn Docks, King's Lynn, Norfolk. The planks, deals, &c., are transported by a conveyor consisting of two driving chains having transverse bearers at intervals. The device is intended to supplant hand labour.

Concrete Walls.—13,278. E. L. RANSOME, 532, Ninth Street, New York City, U.S.A. The object of this invention is to accelerate the drying of concrete when used in the construction of walls. The successive portions are moulded into continuous chambers with inlets for heat, which is afterwards applied from a gas jet or other source. The heat is in some cases associated with carbonic or other gases that will aid the hardening of the concrete.

Combined Snow-Sweeper and Water-Cart.—14,385. W. WOOD, Victoria Street, St. George, Bristol. This invention relates to a combined snow-sweeper and water-cart for use on tramways; the vehicle also carries cleaners for the grooves in the rails. The driving power may be through the axle or furnished by an electro-motor supplied with current from the main leads.

1901.—Hardening Plaster.—4,316. J. L. KESSLER, Clermont-Ferrand (Puy de Dome), France. To render the plaster impervious to a slight depth, so that it may be washed, it is coated with a solution of alkaline silicate well saturated with silica. If the plaster is to be made very hard it must be impregnated with the solution.

The following specifications were published on Saturday last, and are open to opposition until July 30th. A summary of the more important of them will be given next week.

1900.—3,471, NOBLE & LUND, band-sawing machines. 7,579, SMITH & CRUICKSHANK, calculating scales or slide rules. 9,420, CHUBB, doors of safes and strong rooms. 9,850, PURNELL, open firegrates. 10,025, HALL, crushing and pulverising machines. 11,856, CRANE, fastenings for doors. 13,282, BRUNCKHORST, building blocks. 13,467, THOM & OAKES, manufacture of artificial stone. 17,725, BOARDALL, window sashes. 23,779, SHOTWELL, saw clamps or vices.

1901.—862, ROBERTSON, building blocks. 1,750, DOVE, keyless locks or fasteners. 6,344, BOND-BUELL & WASHBURN, acetylene-gas generators. 8,238, DE MARE, ventilators. 8,325, BASSICK, water-closets. 8,361, WORSSAM, pipes for heating or cooling purposes.

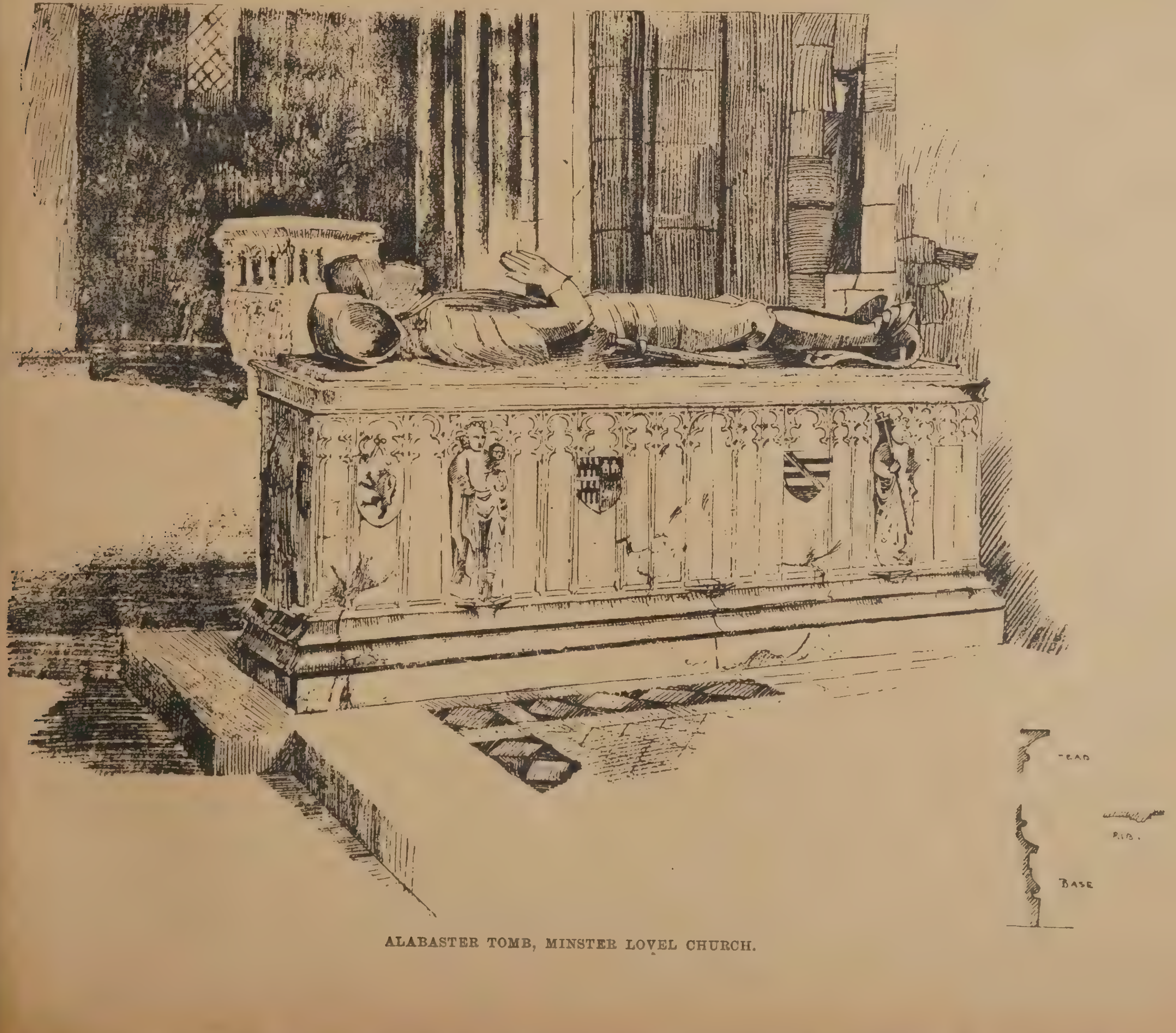
Masters and Men.

Tredegar Dispute.—Nearly the whole of the building trade of Tredegar is dislocated by the strike of plasterers, who are demanding an advance in wages from 8d. to 9d. per hour. All the men, with two exceptions, are connected with the Association of Co-operative Plasterers, and the association has sanctioned the strike.

Holidays for Working Boys.—We have received an appeal from the Bishop of London for funds for the Seaside Camp for London Working Boys, which enables London working boys to have at least seven days' holiday at Bexhill. Contributions will be gratefully acknowledged by Mr. F. Abel Bloxam, the secretary, at Northumberland Chambers, Charing Cross, or may be paid direct to the bankers, Messrs. Cocks, Biddulph & Co., 43, Charing Cross, W.C.

Masons' Strike at Corsham. — The banker masons, to the number of between seventy and eighty, working under the contractors connected with the Corsham and Box stone firms, have struck for an advance in wages of a halfpenny per hour, and the compliance with certain new regulations. The contractors have conceded the advance in wages, but they object to one of the proposed new rules which would impose a considerable restriction on the number of apprentices employed in the yards.

The Stonemasons' Strike at Leicester has been settled after six weeks. At the end of April the operatives demanded an advance of 1d. per hour (from 9d. to 10d.) in their wages, and alterations in working conditions. The employers refused to concede this demand, and the men accordingly came out on strike on May 1st. Eventually both parties agreed to refer the dispute to Sir William Markby, who, after careful consideration, stated that in his opinion 9½d. per hour would be a fair wage for the operatives. This suggestion the masters have agreed to adopt, and the men have now returned to work.



ALABASTER TOMB, MINSTER LOVEL CHURCH.

SOUTH KENSINGTON EXAMINATIONS.

QUESTIONS AND ANSWERS IN BUILDING CONSTRUCTION.—Advanced Stage.

[Note.—The questions and answers in the elementary stage were published in our last issue.]

21. *If we take 8 tons per sq. ft. as the safe load on a course of brickwork, and 120lb. as the weight of a cub. ft. of brickwork, neglecting any question of wind pressure, to what height may a pyramid of brickwork be safely built? What is the duty supposed to be performed by bonding in this structure?*

a. Weight of a pyramid =

$$\frac{\text{area of base} \times \text{height} \times 120\text{lb.}}{3}$$

$$\text{Safe weight} = \text{area} \times 8 \times 2240, \text{ in lbs.}$$

$$\therefore 8 \times 2240 = \frac{120}{3} \times \text{safe height.}$$

$$\therefore \text{height} = 448\text{ft.}$$

It is to be noted that the height to which a pyramid or cone of any material may be built is independent of the base area where an overturning force is not to be provided for.

b. The bonding is supposed to distribute the weight uniformly over each course. It is to be observed that while in actual structures a sufficient base area must be provided for overturning forces, an exaggerated base for which the bonding is insufficient may result in a weak structure.

22. *Why is it advisable to carry the masonry or brickwork of a building well below the surface of the ground (independently of sufficiency of bearing)? Name what you think should be a minimum depth; give the circumstances under which you would not insist upon it.*

A job of pebble dashing, which looked fair when just finished, is found in some months to be scaling off and blotched; give probable cause.

1.—*a.* To be beyond the action of frost.

b. Two feet, in this country; but this depends on the nature of the ground as well as the climate. It should not be insisted upon in the case of a rock foundation.

2. In this country we insist (properly) on sand being sharp, free from loam or clayey matter; in countries where there is *no frost.* or very slight frost, masons do not understand this provision, and they by choice use mud mixed with lime for mortar. If the job of pebble dashing looked well when finished, it was probably done in suitable weather. If the "stuff" contained loam or clay to any serious amount, the first frost (or rather after frost) would make it scale and blotch.

23. *What are: stock bricks, malms, purpose mades, place bricks?*

In selecting the best bricks from a heap, they are taken up in pairs and thrown to a second man; the work is done rapidly; what instructions would you give to the man picking up the bricks to ensure that the second man receives picked bricks?

Bricks from the same kiln differ by greater amounts in one dimension than in either of the other dimensions; which dimension is this, and why?

1. Stock bricks are good common bricks, mostly clamp burnt. Malms are made from clay mixed with chalk and cinders. Purpose mades are bricks made to special shapes. Place bricks are under-burnt stocks.

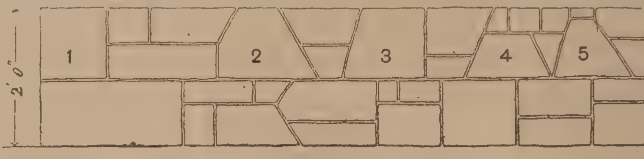
2. Properly-burnt bricks are recognisable by their colour and misshapen bricks by their form. The workman is to be instructed on these points. As he picks up the bricks he knocks them together, and the sound tells him whether the bricks are sound and well burnt. He is not to pass unsound bricks to the second man.

3. It is difficult to have exactly equal firing; and as unequal firing, or burning, causes unequal shrinking, the longest dimensions (the length of the brick) will vary most in absolute amount.

24. *What are: Portland cement, Roman cement, Keene's cement, Medina cement?*

State what you know of the manufacture and properties of good Portland cement. What would you specify as the conditions to be fulfilled by good Portland cement? How would you perform the test?

1. Portland cement consists of 75 per cent. of chalk mixed with 25 per cent. of clay, dried, burnt in a kiln, and ground fine. Roman cement, consists of nodules found in London clay, driedf burnt, ground. Keene's cement consists of plaster-of-Paris soaked in a saturated solution of alum, and then recalcined. Medina cement is obtained from nodules dredged from the bed of the Solent—similar to Roman.



SOLUTION TO QUESTION 26.

2. Portland cement. The materials are, roughly, limestone and clay. In localities where the limestone is found soft, in the state of chalk or whiting and fairly free from flints or pebbles, and the clay also in a state to easily work into mud with water, the chalk and clay (in the proportion of three parts to one part) are pugged together with water and run into tanks or backs as slurry. The slurry is dried, broken into suitable fragments, and burnt in a kiln. The resulting clinker is ground very finely and spread to "cool" and "air slake." Where the limestone is hard it is ground fine before being mixed with the clay. The latter may be burnt and ground before mixing with the ground limestone, and the mixture is pressed together (with a small allowance of water) into suitable small blocks for burning. Cement should be finely ground, and when made into a briquette it should bear a good tensional stress. The test for fineness which is most commonly spoken of—namely, passing the cement through a sieve of so many meshes to the square inch made of a wire of a certain gauge—is, owing to the difficulty of keeping such fine sieves in good order, an impracticable test. A better test for fineness is the behaviour of the cement when gauged with a suitable sand. Briquettes are made by mixing with a moderate amount of water, filling into brass moulds carefully, and, when "set," placing under water for some time. The briquettes are tested in a machine which gives a steady gradually-increasing pull. A seven days' neat cement briquette should bear 350lb. per sq. in. The expectation of a gauged briquette of good cement depends upon the character of the sand, and the tester should see that he has got a standard figure with a definite sand, so that when he uses this figure the sand is always of the same uniform character. There are many other tests proposed A rough-and-ready test which can be applied by a workman is most valuable. A workman can judge by the feel of his arm whether cement is too "hot" or "right" or "dead." He might occasionally be mistaken in "dead" cement. The cold feel of dead cement is not altogether a question of temperature; a thermometer will not answer for the workman's arm. The weight per bushel must be taken with the question of fineness (about 112lb.).

25. *A short deep Warren girder is shown loaded at its two bottom joints; the two loads being equal, state which members of those marked a to i are in tension and which in compression.*

What change will be made if the left-hand load is made double of the other? What will be the nature of the stresses if the girder is loaded equally at the three top joints, but no load on the bottom joints?

(See accompanying illustration.)

1. *a, d, d, i,* are in compression; *e, b, f, h, e,* are in tension; *c* and *g* have no load.

2. *a, d, d, i,* and *g* are in compression; *e, b, f, h, e,* and *c* are in tension.

3. *a, d, d, i, c, g* are in compression; *e, b, f, h, e* are in tension.

26. *A wall is being built in coursed rubble; the stone is irregular fragments of granite, or trap, or any stone which fractures without much regard to "natural bed." Sketch two 12in. courses in elevation of such a wall for, say, 4ft. long, scale $\frac{1}{8}$; put numbers 1, 2, 3, &c., on the stones of the top course, showing the order in which a mason working from the left towards the right would set them.*

The mason speaks of the bed and the face of such stones; what does he mean? What is "rock-faced" work? What is a "shiner"?

(See accompanying illustration.)

The mason would place his good bedded stones to cover the joints in the course below; he would make up between with closers, and level up his course for the succeeding course. The mason sees, easily, two rough faces which he can dress with his hammer so that they will meet at a right angle. He has to choose between these two which he will show in the face of the wall, the other being the "bed" of the stone: if he is building for *strength*, he will put the largest face for the bed; if for *show*, he will put the smallest. A "shiner" is a thin stone set upon a small bed, and showing a large face in the wall. The rule of setting stones on their "natural" beds does not apply to these stones. Rock-faced work consists of stones dressed (punched) to show regular joints (including bed joints), the faces being "pitched" off from the edges of the joints, leaving portions of the stone projecting.

27. *A usual form of bond in brick walls shows three courses of stretchers, followed by one course of headers in face; the drawing shows the end elevation of a two-brick wall in this bond. Repeat drawing, and show both sides extending, say, three bricks along from the quoin. Sketch separately the three bottom courses in plan.*

What can you say in favour of thick joints in modern brickwork in regard to special strength of work? What precaution should be particularly well observed in building bricks with cement mortar?

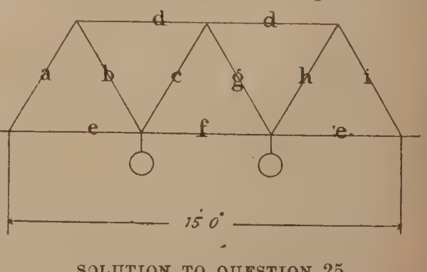
a. See accompanying illustrations.

b. Any rigid body placed on a surface more or less rough rests on three points only. If the main use of mortar is to distribute the pressure between the courses of bricks, and if the mortar is of less value in its resistance to crushing than the bricks, the joints should be no thicker than will suffice to distribute the pressure; but the increasing use of Portland cement in mortar has altered the conditions very much, and if the joints are not thick the advantage of using cement in the mortar is lost. With many kinds of bricks, Portland cement does not hold well to the surface; good thick beds and joints form a continuous matrix enveloping the bricks. If the work is to be stuccoed, the joints (especially if left rough) give hold to the stucco.

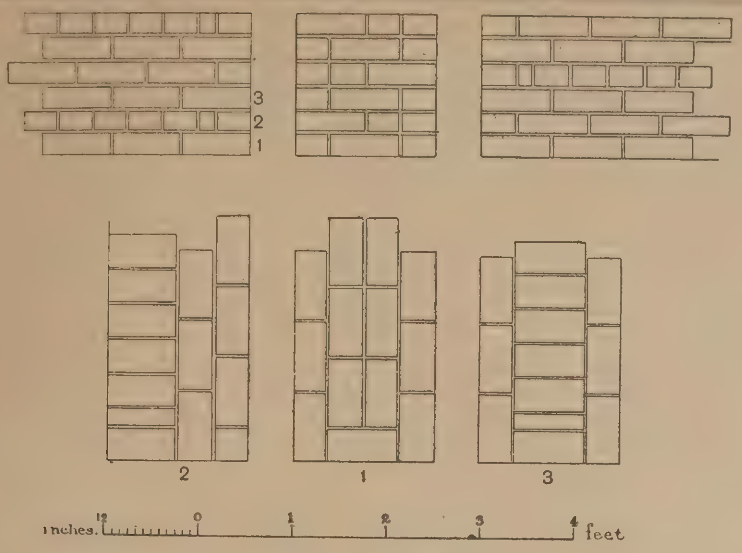
c. The bricks should not be too dry; they should be *sufficiently* wetted; if too wet (which is not usual) they may make the mortar too soft.

28. *Show by a sketch, to the scale of $\frac{1}{16}$, a cross-section of a slated roof extending 5ft. up from the eave; slates 26in. long. The wall is 1ft. 6in. thick; it has a projecting eave-course (of cut stone); rafters 5in. deep. What is rendering, and what purpose does it serve? How would you specially secure the tails of slates in a very exposed situation, as near the sea?*

Empresses, 26in. by 16in., cost £14 per M. Countesses, 20in. by 10in., cost £6 5s. 0d. per M. What points would you take into account in comparing the cost of a square of Empresses and a



SOLUTION TO QUESTION 25.



SOLUTION TO QUESTION 27.

square of Countesses? and give a rough comparison.

a. The sketch needed for this question may be the same as that given in answer to question No. 10 in the elementary stage (see p. 366 of last week's issue), except that the slates are longer.

b. Rendering is plastering the slates on the inside of the roof between the battens (or "laths") with rich well-haired plaster (coarse stuff). It is important that the stuff shall be well pushed in at the top edges of the battens. It prevents the heads of the slates from rattling with the wind. It stops the wind and prevents the slates from moving against their nails (thus making the nail-holes large, or cutting the nails). It is, of course, not done where a roof is close sheeted.

c. In very exposed situations moderately small-sized slates should be used. This gives more nails in a given area. As a matter of course, they should be nailed at the middle of the slate (in nailing slates in the middle, great care should be taken by the slater to drive the nails properly—if they are not driven home, the top slate bears on the head of the nail; and if they are too far driven, the nails draw the slate down, bending it). To fasten the tails of slates, each tail should be bedded on a small quantity of mastic in oil cement, laid in such a way as not to show on the roof. Portland cement is sometimes used, but mastic and oil is better.

d. An Empress slate will cover 180 sq. in. (with a 3½in. lap): $\left(\frac{26 - 3\frac{1}{2}}{2}\right.\ 16 = 180.$

A Countess with the same lap covers 82½ sq. in.:

$$\therefore \frac{\text{Cost of Empresses}}{\text{Cost of Countesses}} = \frac{360}{165} = \frac{\pounds 14}{\pounds 6\ \ 5\ \ 0.}$$

With less lap the price will be in favour of Countesses, which, however, need a few more battens, as they take more nails, &c. We have seen above that small-sized slates are more desirable in certain circumstances than those of large size.

29. *Show clearly by a perspective or isometric freehand sketch three or four bays of a secure bricklayers' scaffolding at the corner of a building; the wall has reached about the middle of the second storey. Supply reference letters, and name and describe the various pieces.*

(See accompanying illustration.)

S, poles or standards; L, ledgers; P, putlogs about 6ft. long and 7in. or 9in. by 3in.; B, scaffold-boards, 1½in. to 2in. thick; C, braces; H, putlog hole.

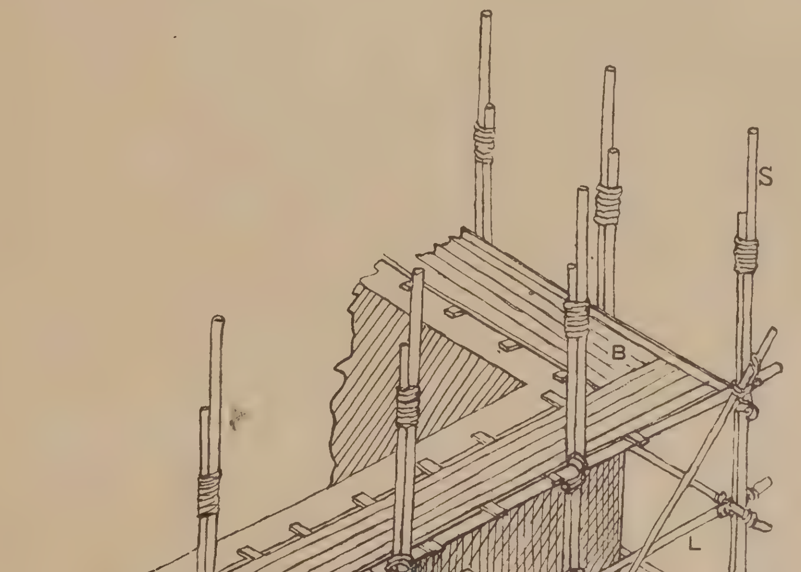
30. *Diagram of roof truss: rafters and struts of pitch-pine, king bolt and ties iron; to carry an ordinary slate roof; spaced 10ft. apart. Draw, to the scale of $\frac{1}{24}$, a little more than half from one end. Show all details to the scale of ¼. No holes are to be bored in struts or rafters; all the ironwork is to be such as can be forged from the bar and fitted by a country blacksmith. Show foot resting on stone template. Has such a truss advantages as compared with an all-wood truss? Explain.*

(See accompanying illustrations.)

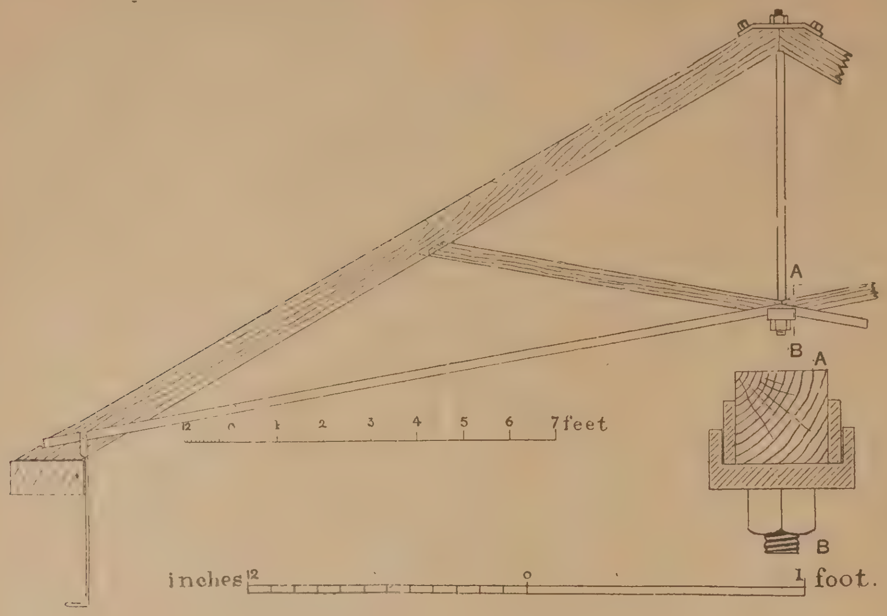
The ties are of strap-iron on edge in order that they may be able to bear their own weight without sagging. The method shown gives better head-room than an all-wood truss; moreover, it is probably cheaper.

31. *Compare sliding window sashes, as common in this country, with casement or French windows. In what circumstances would you use one kind rather than the other? What precautions should be observed to prevent guillotine sashes from rattling with the wind? Draw, to the scale of ¼, cross sections of bottom rail and frame sill of both kinds of windows. Explain the points of good fasteners for both kinds; illustrate with sketches.*

If French windows are made to open inwards, the sash or sashes (considered as a valve) are blown by the wind off the valve seat, and the wind enters. It is better as regards weather-tightness if the window is made to open outwards. Casement windows, which hang on hinges, are considerably stressed by their own weight; they should have numerous hinges to hold them to the work at the heel, and they should have strong and good fastenings, binding them at as many points as possible. Casement windows are used to give passage to balconies



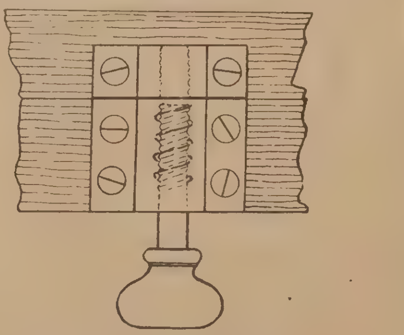
SOLUTION TO QUESTION 29.



SOLUTION TO QUESTION 30.

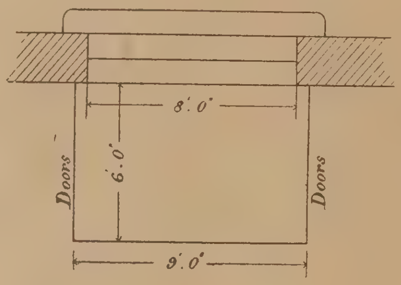
and to lawns direct from a room. In this country they are not snug enough, and it would be advisable, especially in country houses, to have the opening fitted with guillotine sashes as well as casements, so arranged that the sliding sashes could be put up or down out of the way in fine weather. Guillotine sashes are not stressed much with their own weight. They are easy to maintain in good order; wind-pressure from the outside presses them against the parting slip, they are cheaper than casements, but they can only be opened to give one-half of the window area. To keep sashes from rattling at the meeting rail, the sash fastener should draw the sashes together, and there should be "room" for the sashes to nip the parting slip when they are drawn together. In fitting, care should be taken that when the window is closed the bottom sash will absolutely rest on the wood sill; if it does, and if the sashes are fast at the meeting rail, the bottom sash will not rattle. The point now to be attended to is the upper part of the top sash. Many persons put in a small wooden wedge called a window wedge, and this is efficacious, but it will probably be found that window wedges can be dispensed with if, in hanging the top sash, the window cords are fastened to it as high up as possible, and if the pulley boxes for this sash are kept as high in the frame as possible. It appears absurd to keep the pulley boxes at the same height, as is commonly done. This weakens the frame very much, and there is no doubt if the upper sash hangs from the lines by its top there will be no rattling: the pull of the weight on the cord would oppose rattling.

There are very many sash-fasteners, which circumstance shows that there is still something to be desired which none of them gives. The old screw fastener with a helical spring to keep it back is quite as good as any of the others (see accompanying illustration). It seems absurd to make these fasteners with round knobs. It would be a little more difficult to make them elliptical in outline, but this should be the shape. The spring of this fastener is well protected, and it does not readily get out of order. A fairly good fastener without any spring is the Anglo-American (it has another name when made by a different maker). A sash-fastener ought to hold the sashes well together; it ought not to be openable from the outside; it ought to have no spring liable to rust and soon break. (In further answer to this question, see the drawings accompanying questions 9 and 13 on pp. 366 and 367 of last issue.)



SOLUTION TO QUESTION 31.

32. *Plan of lobby to a balcony of a small public hall; height of ceiling of hall, 11ft.; cornice, 8in. deep from ceiling, is carried round the partition; partition framed and openings filled with panels of framing, 2in. thick, having panels 1in. thick. Doors to be double-leaved spring swing doors, hinged to posts; doors 7ft. 6in. high. Draw, to the scale of $\frac{1}{16}$, elevations showing a pair of doors; one-half of the partition. Give full details and sketches for a neat piece of work in pitch-pine.*



(See accompanying illustrations, which are fairly full and need very little explanation.) Pitch-pines require very thorough and careful seasoning. The bolection moulding shown should be fastened to the framing, and not to the panels: the panels (which are wide) should be free to contract a little.

A Granite Cross in Memory of Prince Christian Victor, the eldest son of Prince and Princess Christian of Schleswig-Holstein, is about to be forwarded to South Africa to be placed over the Prince's grave in Pretoria Cathedral burial-ground. The cross (of the early Irish type in treatment) and the kerb are of Balmoral granite from the royal estate, while around the cross is a railing made from the metal of old guns that once did good service in our wars. The cross and railing were designed and carried out—from suggestions made by the Princess Christian—by Mr. A. Y. Nutt, architect at Windsor Castle, the work having been executed by Messrs. Macdonald, of Aberdeen, and Goslin, of London.

THE TRUE EDUCATION OF AN ARCHITECT.

AN AMERICAN VIEW.

By RUSSELL STURGIS.

FIRST of all, he should be taught how to build. It is hardly supposable that this proposition will be seriously disputed, although in practice its truth is disregarded so generally that it becomes necessary to assert it once in a while. There is a growing tendency to treat the art of architecture as the art of making drawings, "rendered" in accordance with certain hard and fast rules; and it is as well to repeat that the business of an architect is to build. What is meant when it is asserted that the young architect must be taught how to build?

When any man calling himself "architect" or "builder," or merely acting as the amateur creator of his own home, prepares to put up a building of any sort, the primary necessity for him is to have a thorough understanding of the means at his disposal and the object which he proposes to attain. The material which he can control he should understand exceedingly well, and its possibilities. The building which he intends to erect he should see clearly in his mind's eye, and its construction. This requires that he shall know how stones and bricks are laid or set; how mortar is mixed and applied; how walls are bonded together; when anchors are needed which shall tie those walls to the floors, and whether it be ever possible to avoid the use of anchors; under what circumstances lintels may be safely used; how far corbels may be used to advantage; the conditions of an arch, its line of thrust (in a general way, for it is not always feasible to calculate the exact line of its sideway pressure); how gutters may best be carried at the head of the wall; what are the approved methods of attaching to the main structure such lighter and smaller pieces as bay window, carriage porch or kitchen wing.

He must know, in a familiar way, what a brick wall is, and what are the conditions of its being—solid or hollow or built with hollow bricks. In some of our States the masons have a theory that brickwork ought not to be laid up too solidly, nor so filled with mortar as to be one homogeneous mass, because such a mass transmits the moisture from the outer to the interior face. These masons prefer slightly and loosely built walls, with plenty of cavities within to act as air spaces.

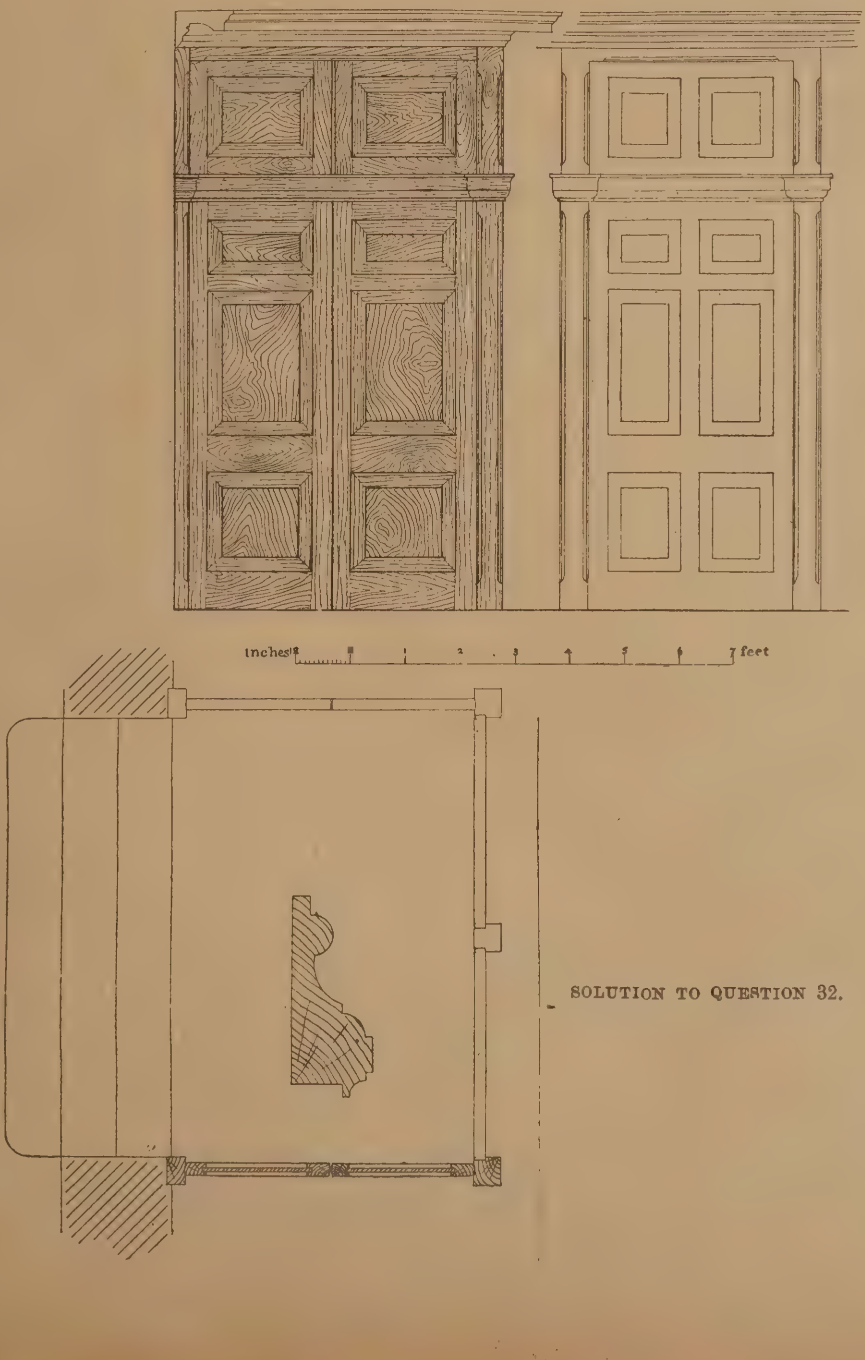
Our builder should know whether that astonishing theory is warranted or not, and also whether a more deliberately planned air space is better or not so good as furring, and whether either advice be necessary in a given case. He should have even some notions of double air spaces, for he may be called on to build in Minnesota or Manitoba. Again, he should be aware how commonly the skilled French builders disregard such devices altogether, and trust to the repellant power of good stone walls. The building of chimneys should be a special fad of his; for although it may be admitted that no man can guarantee his flue and his fireplace as affording together a chimney which will not smoke, yet there are conditions precedent, and one of these is that the flue in an outer wall should be protected on its weather side from stress of weather. Many are the chimneys that will not draw because the outer air keeps them too cold, and because the wind drives through the porous bricks of the outer wall. Such chimneys there are, even in solidly-built houses, which seem to transmit rain and cold from without more readily than smoke and hot air upward from within. The professional architect, then, must know, in the intimate sense indicated in the above paragraphs, the whole art of building. He must also love building; he must love heavy stones, and good bricks, and stout solid walls, and handsome timbers, handsomely cut and framed. He must even love the new material, wrought and rolled iron and steel, for its great and as yet only partly known capabilities. When one is asked by a would-be student about the chances of succeeding as an architect, it is expedient to find out what his proclivities are, and whether he is merely interested in fine art, and seized with the idea that architecture is an easy fine art to study and to practice.

Advice to the effect that really he ought not to become an architect unless he truly loves building and the materials of building is apt to be in place, and instances could be given where such advice has been well applied and well taken. One of the very best and worthiest of our mural painters had that advice given him twenty-five years ago, when he proposed himself as a student of architecture. He was told plainly that it seemed to his adviser that he was rather a lover of drawing and a dreamer of fine art dreams than a possible builder. The young man took the advice that was given him, and the noble results of his career prove the soundness of the counsel.

The architect should love the quarries, and should visit them with eager curiosity. The cleavage of stone and its appearance in its natural bed should be not only a delight to him, but an object of close study. He should love the lumber yard, not to say the forest. To him, the timber in itself should be a thing delightful to study, and its possible uses delightful to contemplate. He should love the brickyard, and experiments in cements and in mortars should be his holiday amusement. Finally, the architect must have such an eye and such a soundness of judgment that bad work cannot escape him. A familiarity with details not unlike that of a good master-builder he must combine with a knowledge of principles and possibilities far beyond that of the master-builder, so that good work will come to his buildings as of inevitable sequence, and bad or even slighted work will be impossible in them.

The matter of modern scientific construction in iron and steel can only be touched upon here, and there is really but one thing that need be said about it. Such construction is the affair of the engineer. Let it be admitted that the architect should understand its general principles. These are not so remote or so mysterious as they may seem to the beginner. When it comes to the actual building, to be run up in ten months, the metal uprights and ties composing the structure and the exterior of masonry being a mere concealing and protecting shell, that metal structure is the work of the engineer, and must be. It is, indeed, probable that in this case the engineer should be the first man employed, and that the architect should act as his subordinate; for the plans of the storeys are rarely complex or difficult, and all the uses of the building are simple and obvious, while what need special ability are the calculations of the engineer. It is useless for the scheme of education laid out for any pupil in architecture to include steel construction in its higher development.

What, then, becomes of our student of architecture? Is he to be expert in one thing only? He is to be expert in all the branches of ordinary building, ready, dextrous, handy and full of resources; and he is to know so much of the general principles of building, and also of the putting together of metal and the conditions of stability of the metal structure, that he can foresee the need of engineering skill in a given case, and can forestall the probable decisions of the engineer. What should be taught to the young man meaning to be an architect is, primarily, the how and why of simple everyday building, such as has been practised for centuries, is adapted to all those materials which his own country furnishes, and is according to all those processes which his countrymen recognise: Thus, if he should wish to study Byzantine vaulting without centres, or Gothic vaulting with ribs, or vaulting in cut granite, such as is used in our seacoast fortifications, it would be, in a sense, an additional and most interesting study for him; but his instructors should see to it that, first of all, he thoroughly learns the building of common life. After ten years of practice he may well enjoy the attempt to introduce into his work some of those beautiful, simple, inexpensive methods of building which the past offers for his consideration, while the present ignores them; but he will not begin with this. Building of an everyday sort—that is what he needs to know; but he needs to know it thoroughly well, to know it as a child feels the conditions of stability of his house built with wooden blocks. And he must grow to be ambitious to excel in the perfectness of his work. The writer remembers the shock which he felt when, as a student of architecture, he heard one architect in large practice say of the newly fallen wall of the unfinished church of a brother architect, that no one could find any fault, because the accident was due to frosty weather. Was that the standard which one architect set, up for another? Was it really held by prominent architects that a wall might fall down, and the blame of it be laid on cold weather? His wonder has not diminished since that time, nor does it seem easy to understand how anything can excuse the falling of a wall, unless it be an earthquake or a bombshell. A mason of repute would never have forgiven himself, or have been forgiven, for such a collapse. The builders in our cities are not too conscientious, nor are the builders in our small towns too skilful or troubled with too high a standard of excellence; but the architect, as we find him, may generally lean upon the builder, as we find him, with great advantage, and get sound and good example from the practice of the builder when left to himself.—From "The Architect and Builder" (Philadelphia and New York).



SOLUTION TO QUESTION 32.

A NEW CHURCH AT WEST BRIDGFORD.

A NEW Wesleyan Church at West Bridgford is being erected on Trent Boulevard. The building will be 58ft. long by 31ft. wide, and is to accommodate 300 worshippers. The style is Perpendicular Gothic. At the rear a church parlour is being erected the measurement of which will be 31ft. by 17ft., with two large vestries, over which there are to be two class-rooms. Every provision has been made for a heating chamber, kitchen accommodation and other offices. Access to these at the back of the structure will be obtained from the church by means of a specially-arranged hall at the side. The roof of the church will be partially open, and the whole of the internal finishings, including the pews, are to be of Canadian pine. At the main entrance to the church will be a porch 21ft. by 9ft. The main front will be faced with Coxbench stone and dressings of white Hollington stone, while a special feature will be made of a large tracery window. At the angles of the building it has been arranged to have stone ornamental buttresses, terminating with stone pinnacles. The church, it is expected, will cost £2,000. Mr. A. E. Lambert is the architect, and Mr. T. Barlow the builder.

The New St. Margaret's Established Church, Tollcross, has just been completed. It is built on a site south of the railway at Tollcross Station, fronting Braidfauld Road. The style is late Gothic. It will afford accommodation for 322 persons. Ground is also reserved on the north side for nearly doubling this accommodation, and on the east for building a small hall and session-house. The plan consists of a nave with aisle and a chancel or choir raised one step above the floor of the nave. The main entrance is by a roomy porch at the south-west corner, which communicates with nave and aisle. The pulpit is on the north side of the nave and is of stone. The architect was Mr. W. G. Rowan, 234, West George Street, Glasgow. The church is intended to cost about £2,300.

DRAINAGE SYSTEMS FOR DWELLING-HOUSES.

By JOHN W. HARRISON.

THE following notes and illustrations are intended to show the different methods of drainage for dwelling-houses, from the common back-to-back type to the detached house. The plans and description of the drainage for the back-to-back houses are introduced to show the defective method of laying, &c., which is a cause of serious nuisance.

In the accompanying sketches combined drains and sewers are shown by double lines and single drains by one line, and the following abbreviations are thus explained: I.C, inspection chamber; S, intercepting trap or siphon; F.A.I, fresh-air inlet; V, ventilating pipe; V and S.P, vent and soil pipe; G, gulley; W.C, water-closet; D.B, dustbin; C.C, concrete; D.S, down spout.

Fig. 1 shows the plan of a block of four houses built back-to-back, a type very common in some of our northern manufacturing towns. It will be seen that all the four houses are drained by a 6in. combined drain or sewer, which is laid through a covered passage or cart-way. All these houses have cellars, and the passage sewer is not often laid as deep as the cellar floors, while the joints of the pipes are often made with clay, so that the slightest obstruction or settlement of the ground causes the joints to open, and then leakage occurs into the cellars, immediately adjoining the passages. The house sinks are grouped together in the centre of the passage at the head or top of the cellar stairs in each house. The sink waste pipes all empty into one gulley, which is fixed in the centre of the passage over the passage sewer. Waste pipes empty over the gulley, but under the passage flagging. The gulley is covered with a grating; and as all the coals of the four houses are tipped on to the top of this grating the gulley is often full and overflowing into the cellars, which the writer has seen 4in. and 6in. deep in sewage.

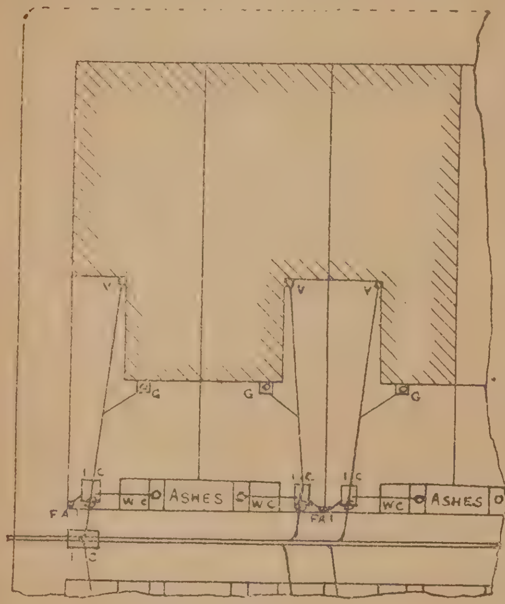


FIG. 2.

One front and one back house each have bedrooms over this passage. The sewer is not laid in concrete, and the ceiling of the passage is only lath and plaster on wooden joists. No intercepting trap is fixed on the drains, nor on the passage sewer, nor is the same ventilated. Only too frequently the down spouts do not discharge over gulleys so that they ventilate the sewer into the upper rooms of the house through the open joints and top. The sewer after reaching the yard branches off by 4in. drains to each w.c., and a gulley for the yard drainage.

Fig. 2 is a plan and Fig. 3 a section showing the method of laying the drains for ordinary small through houses of four or six rooms, generally built in terraces and with the sewer in the back street or passage, which should be at least 9ft. wide, to allow carts to pass along for the purpose of emptying the ashpits, &c. The inspection chamber in the yard is not a necessity, but is a great improvement, as, if an interceptor with a raking or inspection arm is fixed, the drain can be cleared of obstruction in either direction by means of drain rods without disturbing the surface of either yard or passage.

Fig. 4 is a plan and Fig. 5 a section showing how the drains should be laid when there is no sewer in the rear of the houses, and all drains need to pass under the house from back to front. The drain between the inspection chambers should be completely surrounded by 6in. of good Portland cement-concrete if of stoneware pipes, but it is preferable to lay the portion of this drain with strong cast-iron pipes with caulked lead joints, and they should be coated with Dr. Angus Smith's solution to prevent corrosion; or they should be glass-lined pipes.

Fig. 6 is a plan showing how semi-detached houses divided only by a narrow passage can be drained by a combined drain or sewer laid through the passage, and terminating in an inspection chamber, into which the two yard drains empty. The interceptors in this system are fixed just inside the yard gates, with the fresh-air inlets brought up the adjoining yard wall.

Fig. 7 is a plan showing how semi-detached houses are drained when they each stand in their own grounds. It will be seen that this is a more expensive method than the last, as two inspection chambers are required to each drain.

Fig. 8 is a plan showing the drainage system for a detached house, with stable if required.

The following remarks apply to all the above systems:—

Fresh-air inlets should be brought up to 2ft. or 3ft. above the ground, and be fitted with a mica flap-valve, to prevent back-draught, or they should be carried about 6ft. high. They are generally sunk into a chase in the wall to prevent them being damaged. All the vent shafts and soil pipes should be carried up full diameter, without bends if possible, to a height of 2ft. above the eaves if there is no attic, and above all windows which open and clear of all chimneys if there are attics; and the top end should be fitted with a wire balloon.

The special points requiring attention are: The drains should be deep enough under the ground to prevent breakage or disturbance by carting, &c., on the surface. The fall or gradient should be uniform and sufficient to make the drains self-cleansing, and not less than 1 in 40 for 4in. pipes and 1 in 60 for 6in. pipes, as they will seldom be flowing full. If sufficient fall cannot be obtained a flushing apparatus should be fixed at the upper end of the drain to discharge automatically and at regular intervals.

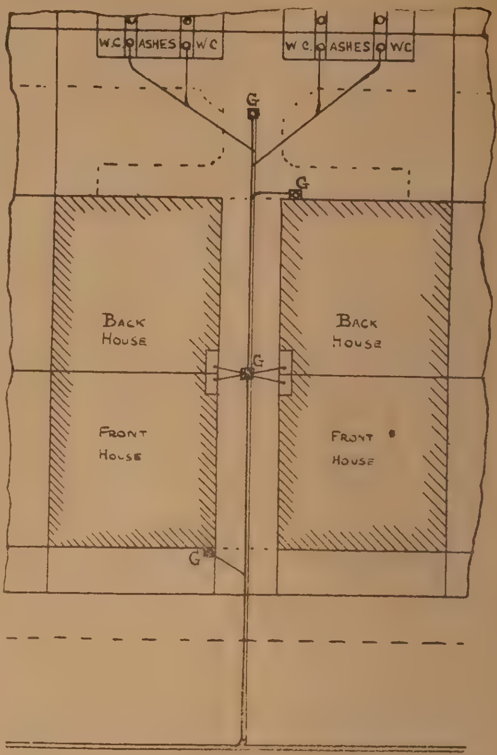


FIG. 1.

The pipes should be glazed socketted stoneware, with the glaze omitted from the inside of the socket and the outside of the spigot end of pipe to afford a good key for the Portland cement, which should be used for the joints.

The foundation or ground should be solid. If it is not so, the drains should be laid on a good thick bed of concrete. The drains should be laid in straight lines from point to point, and, unless prohibited by expense, inspection chambers should be built at all angles and important junctions. The main drain should be disconnected from the sewer and ventilated. All w.c.'s should be trapped and ventilated. Slop sinks are treated in the same way as a w.c.

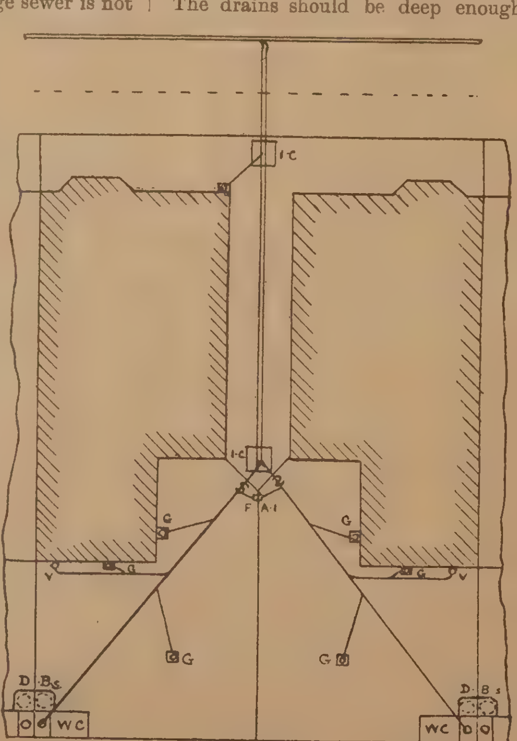


FIG. 6

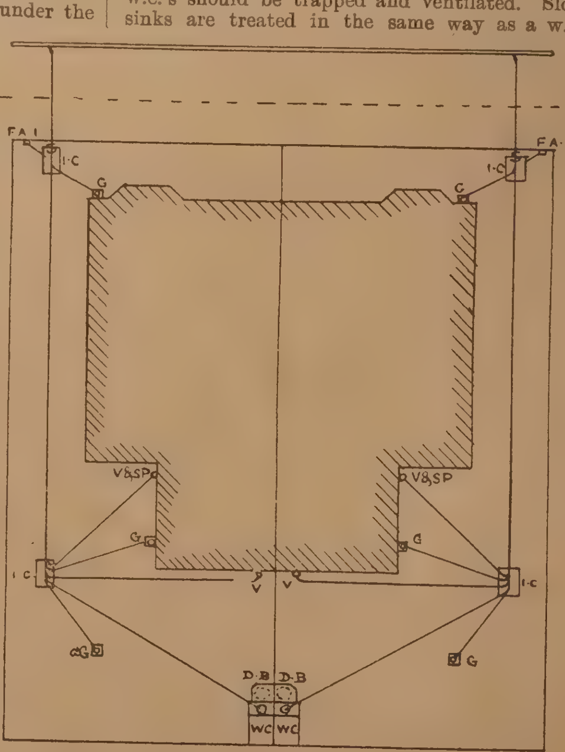


FIG. 7.

All sink, bath and wash-basin waste-pipes should be trapped and disconnected over an open channel 18in. distant from a trapped gulley. Plans should be prepared of all drains, showing their depth and direction, and kept for reference, as time may be often saved by being able to at once locate any drain or branch.

Engineering Notes.

The "E.L.B." System in America.—In the course of a recent meeting of the shareholders of the Electric Lighting Boards, Ltd., it was announced that the American rights of the system have been disposed of for a very considerable sum, the first cash payment, which was recently cabled, alone amounting to £15,000. The negotiations for the sale were conducted entirely by Miss Amy Ashton Bence, the secretary of the company, who visited New York, and as a token of their esteem the shareholders handed her a substantial cheque, while a set of plate was presented to her by the directors in their personal capacity. Miss Bence was formerly the right hand of the late Sir Augustus Harris. Among the shareholders is Mr. J. H. Colls, of Messrs. Colls & Sons, builders. A demonstration of recent improvements and developments of the system will shortly take place.

New Welsbach Burner.—The Welsbach Incandescent Gas Light Co., Ltd., of York Street, Westminster, S.W., are introducing a patent self-intensifying Kern burner for all kinds of public lighting. Its great feature is that a considerably intensified light is obtained without the use of any compressing plant or high-pressure mains. The burner itself does not materially differ from the ordinary Kern burner, the extra light being secured by the employment of a long, specially-designed, chimney. With a single self-intensifying burner using 10 cub. ft. of gas per hour at ordinary pressure a light of 300 candle-power is obtained. The Welsbach-Kern high-pressure burner, for use with compressing plant, works at 8in. to 10in. water-pressure, and gives 30 to 35 candles per cub. ft. of gas, so that with a consumption of about 10 cub. ft. per hour 350 candle-power is obtained. Five-light candelabras of these burners are in use for lighting up the grounds of the Glasgow Exhibition, the total illuminating power of each such standard being, approximately, 5,000 candles.

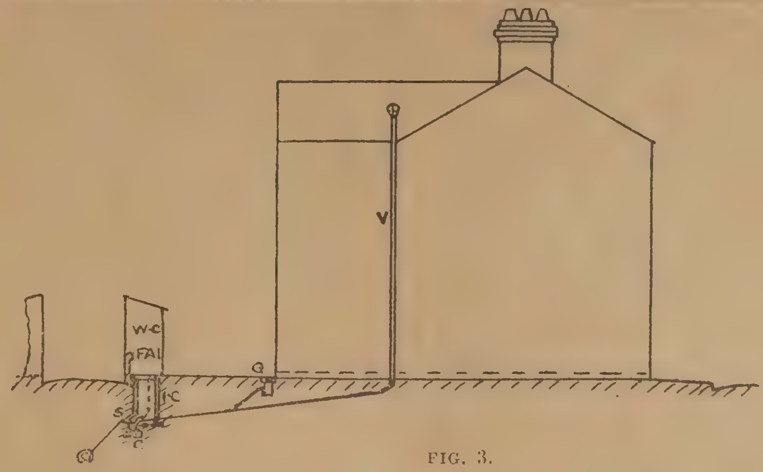


FIG. 3.

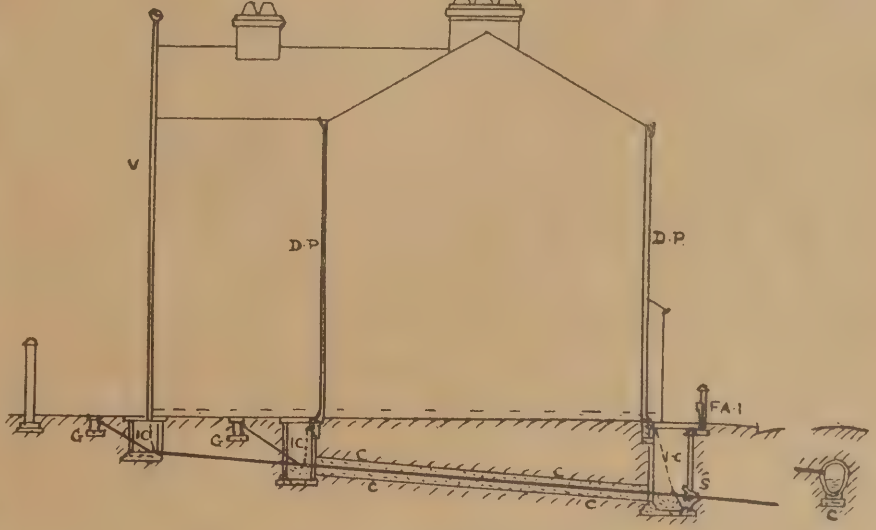


FIG. 5.

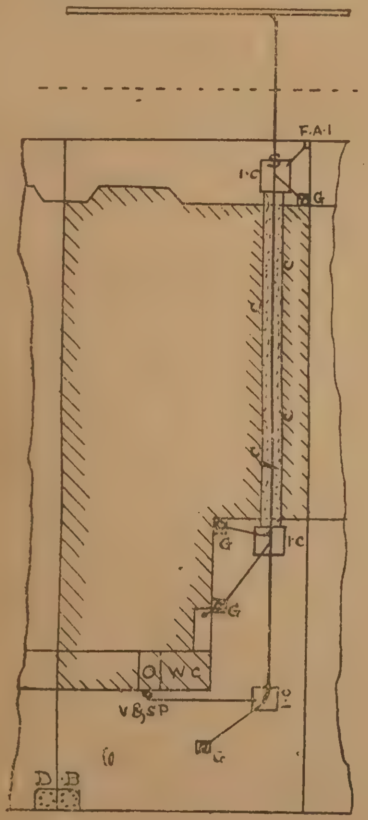


FIG. 4.

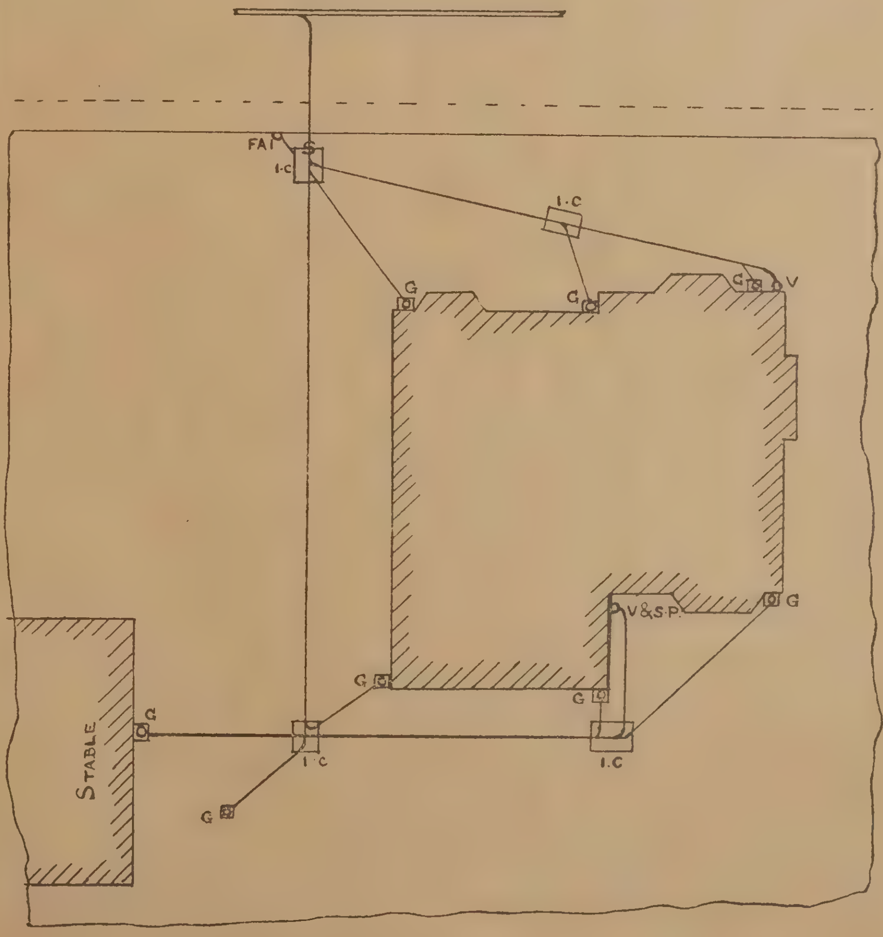


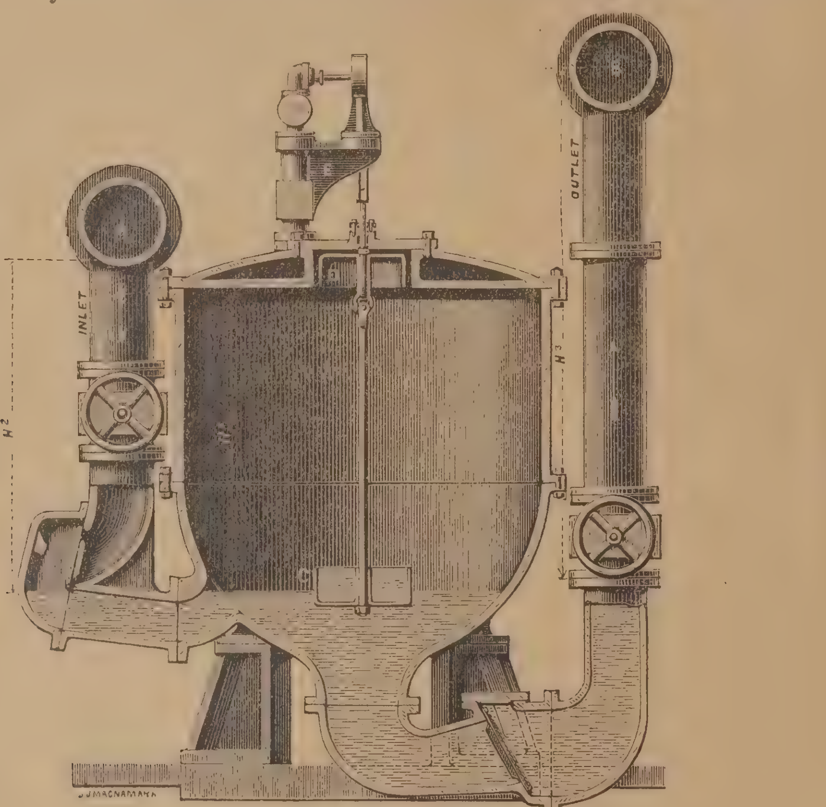
FIG. 8.

SEWAGE DISPOSAL.

A Description of the Shone Ejector.

A VERY interesting visit was made by the members and associates of the Society of Engineers on June 12th to the air-compressing station for the Shone system of sewage ejection at the sewage disposal works, Erith, Kent, and the engineering works of Messrs. Fraser & Chalmers, which are also situate at Erith.

The Erith Sewage Disposal Works in which the air-compressor plant is working occupy about two acres of land. The gas-engine air-compressors are four in number, being two sets in duplicate. The first pair produce the compressed air for working the Shone ejectors for pumping the low-level sewage. These engines were made by Messrs. Crossley Brothers, and comprise two Otto gas-engines and air cylinders, each to compress 158 cub. ft. of free air per minute to 11lb. per sq. in. The second pair produce the compressed air for the sludge pressing and for driving the mixing machinery. The gas cylinders indicate 25 h.p. each engine, and the air cylinders are capable of delivering 250 cub. ft. of air per hour at 100lb. per sq. in. All four engines have automatic arrangements for throwing the air cylinders out of work when the working pressure in the receiver is reached. The second pair have this apparatus so arranged that the air cylinders can be entirely thrown out of work for any desired period. In addition to the foregoing, small air-pumps are fixed in each ejector chamber in order to pump out the condense water from time to time as it accumulates in the chambers. Dowson gas is used for the gas engines, and is produced by the plant erected at the works by Messrs. Paisley, Welsh & Co.



THE SHONE PNEUMATIC EJECTOR.

The air main is laid at a depth of about 4ft. along the Manor Road, High Street, West Street, Lower Road, and Lower Abbey Road, to the several automatic ejectors situate in those roads, the last station being about three miles from the works. Following are particulars of station plant :—

Station No.	Name of Station.	No. of Ejectors.	Discharging capacity of each Ejector in gallons per minute.	Size of Air Supply: inches.	Size of Air Exhaust Pipe: inches.
1	Appold St.	2	300	2½	2½
2	High St. -	2	200	2	2
3	Lower Rd.	2	150	2	2
4	Station Rd Belvedere.	2	150	2	2
5	Lower Abbey Road.	2	50	2	2

The compressed air is delivered to the ejector stations through 4,600ft. run of 4in. cast-iron socket pipe, jointed with yarn and lead, and 10,900ft. run of 3in. similar pipe. All the pipes were tested to a pressure of 40lb. per sq. in. The fall in pressure in one hour does not exceed 5lb. The compressed-air pipe is provided with stop valves close to each of the automatic valves, so that each of the ejectors can be repaired independently of the working of the others. Siphons for drawing off water are constructed at several points in the air main.

The Shone system of sewerage may be briefly described as a system of distributed stations for the lifting of sewage, worked from one central station by means of compressed air, whereby the whole drainage area is divided into a number of compact districts, each with its separate outfall and discharging station, the discharge from all the stations converging into one common main leading to the ultimate common outfall. The system is applicable wherever the sewage of a town or district requires to be lifted.

The motive power employed is compressed air, and the action of the apparatus is as follows :— The sewage gravitates from the sewers through the inlet pipe A into the ejector, and gradually rises therein until it reaches the underside of the bell D. The air at atmospheric pressure inside this bell is then enclosed, and the sewage, continuing to rise outside and above the rim of the bell, compresses the enclosed air sufficiently to lift the bell, spindle, &c., which opens the compressed air admission valve E. The compressed air thus automatically admitted into the ejector presses on the surface of the sewage, driving the whole of the contents before it through the bell-mouthed opening at the bottom, and through the outlet pipe B into the sewage rising main or high-level gravitating sewer, as the case may be. The sewage can only escape from the ejector by the outlet pipe, as the instant the air pressure is admitted on to the surface of the fluid the valve on the inlet pipe A falls on its seat and prevents the fluid escaping in that direction. The fluid passes out of the ejector until its level therein reaches the cup C, and, still continuing to lower, leaves the cup full until the weight of the liquid in the portion of cup thus exposed and unsupported by the surrounding water is sufficient to pull down the bell and spindle, thereby reversing the compressed air admission valve, which first cuts off the supply of compressed air to the ejector and then allows the air within the ejector to exhaust down to atmospheric pressure. The outlet valve then falls on its seat, retaining the liquid in the sewage rising main, and the sewage flows into the ejector through the inlet once more, driving the free air before it through the air valve as the sewage rises; and so the action goes on as long as there is sewage to flow. The positions of the cup-and-bell floats are so adjusted that the compressed air is not admitted to the ejector until it is full of sewage, and the air is not allowed to exhaust until the ejector is emptied down to the discharge level. The compressed air for actuating the ejector is produced at a central station, and is conveyed in iron pipes laid under the streets to the several ejector stations, as already explained. The Shone ejectors at Erith were supplied, and the air mains laid, by Messrs. Hughes and Lancaster. We are able to give the accompanying illustration through the courtesy of the Secretary of the Society of Engineers.

Keystones.

Labourers' Cottages at Sidcup.—In illustrating these cottages last week Mr. E. Harding Payne, A.R.I.B.A., was mentioned as the sole architect. We have since learnt that the name of Mr. John Owen should be associated with them, as he was joint architect with Mr. Payne.

New Business Premises at Lancaster are being erected for the Lancaster and Skerton Co-Operative Society, Ltd. The front line is set back in New Street, so as to widen the street. The buildings are of local stone, with bases of Shap granite, the roofs covered with Westmorland green slates. The work is being carried out by Messrs. J. Hatch & Sons, of Lancaster. Messrs. Austen & Paley are the architects.

Another Lady Architect.—Miss Josephine W. Chapman, of Boston, is a successful woman architect. She will be the only representative of her sex at the Pan-American Exposition to be held next summer in Buffalo, N.Y. Miss Chapman has erected a number of churches, business buildings and residences. She employs none but men in her office, as she declares that women fail to give their undivided attention to the work, and at the most critical moment want to go home to make their clothes.

The New Star and Garter Buildings at Aberdeen which have been erected at the corner of Langstane Place, looking into Union Street, are nearly completed. The block is six storeys, and has cost £20,000. The contractors for the works are: Mason, Mr. Edgar Gauld; carpenter, Mr. William Dawson; plumber and electric lighting, Mr. J. F. Anderson; plasterer, Messrs. Rodger & Baxter; slater, Messrs. George Currie & Co.; painter, Messrs. John Masson & Sons; heating, Messrs. Shirras Laing & Co. The stone used is white Kemnay granite. Mr. George Curtis, of John Street, Aberdeen, is the architect.

A New Wesleyan Church at Cowes has been ereced in Birmingham Road. The style is Gothic, freely treated, and the building is of red brick with Bath-stone dressings. The builder is Mr. H. H. Sherrin, of London. On the north side is a tower finishing with a slated spire. The church will seat about 750 persons. The pews, which in the centre of the church are open from end to end, are of pitch-pine. The windows are of cathedral glass. The choir gallery, where the organ is also situated, is behind the rostrum. In addition to the minister's vestry there is a vestry for the choir. The roof is covered with permanent green slates. In addition to the church building efficient schoolroom accommodation has been provided.

The New Government Buildings at Preston now being erected in Market Square, opposite the Town Hall, are intended to provide accommodation for the Post Office and Inland Revenue Departments, including both excise and tax branches. They will be Renaissance in style, and constructed externally of Storeton stone, the roofs being covered with green slates. The public office for post office business and the posting boxes will be placed in the front, while the entrance to the Inland Revenue Office will be in Market Square. The architect is Mr. Henry Tanner, F.R.I.B.A.; the contractors are Messrs. Thornton, Liverpool; and the work is under the supervision of Mr. George H. Woolven,

A New Isolation Hospital at Tiverton has been erected at a cost of over £6,000.

A New Bathing Pavilion at Arbroath has been erected for ladies by the town council at the West Sands. The new pavilion was designed by Mr. William Stewart, burgh surveyor.

The New Church of St. Aidan's, Carlisle, which has been erected on the east side of the town at a cost of about £8,000, was opened last week. A parish hall is being erected in connection with the church, to cost about £1,200, from plans by Mr. C. J. Ferguson, architect.

Christ's Hospital Bill: Discussion Adjourned.—In the House of Commons on Friday last there was a brief discussion on the second reading of the Christ's Hospital Bill. Lord Balcarres, Mr. H. C. Richards, and many other members on both sides of the House, are anxious to prevent the passing of this Bill in a form which might involve the destruction of the old school and the loss of one of the few remaining open spaces in the heart of the City. It was agreed, however, that it would be better not to oppose the second reading, but to reserve the discussion for a motion which will be moved next Friday with a view of so modifying the Bill as to secure these objects.

Site for Liverpool Cathedral.—The Liverpool Architectural Society at a special meeting held on Thursday last, Professor Simpson presiding, passed a report on what they consider the best site for the proposed Liverpool Cathedral. They agree with the Cathedral committee that the St. Peter's Church and the St. Luke's Church sites are unsuitable, but they disagree with the committee in preferring Monument Place to St. James's Mount. They admit that the latter site is the less expensive, that it is quiet and its surroundings are picturesque, while any buildings erected on it would stand out well. But they think that the disadvantages outweigh the advantages. It is inaccessible, and, in an architectural sense, the approach is very bad. The foundations will cause great expense, and the orientation of the building cannot be arranged according to the custom of the English Church. The Monument Place site, which the architects favour, is stated by them to have a position and an approach unrivalled in Liverpool. It is near the great public buildings, and near to or in communication with the principal railway stations. The foundation is rock, and it would be of advantage to the city to remove many of the buildings now occupying the site. The surroundings are not of the best, and the architects admit that the Monument Place site would be very costly. But they think it would be better to acquire a part of it and build a portion of the Cathedral, leaving the rest for another generation to finish.

The New U.M.F. Church, Walthamstow, has been fitted with the latest improved low-pressure hot-water heating apparatus by Messrs. John King, Ltd., of Liverpool.

Chester Cathedral.—A recumbent effigy of the late Duke of Westminster is to be placed in the south transept of Chester Cathedral, which is undergoing restoration, as a county memorial to the late duke.

A New Roman Catholic Church at Huntingdon has been opened in New Town. It will seat about 200 persons, and is built of brick with stone dressings to the windows. The roof is of red tiles. The architect was Mr. Simeon Croot, of Frampton, and the builder was Mr. M. J. Allen, of the same place.

The late Mr. Arthur Cates, who died on May 15th last, aged seventy-two years, has left personal estate of the net value of £174,064 18s. 11d., and has bequeathed £1,500 to the Royal Institute of British Architects for an "Arthur Cates Prize," £1,500 to the Architects' Benevolent Society, £500 to the Benovolent Fund of the Surveyors' Institution, and £500 to the Charitable Fund of the Surveyors' Club.

Mr. E. Stanley Mitton, architect, of Oxford Road, Moseley, Birmingham, has been awarded a diploma and a bronze medal for a design for a bandstand to be erected at the Birmingham Industrial Polytechnic Exhibition to be held in Bingley Hall, August 26th tc November 2nd, 1901, the object of the exhibition being to raise funds for the establishment of bursary scholarships for the sons of artizans in connection with the University of Birmingham.

Watford School Competition: Result.—Mr. Thomas J. Bailey, F.R.I.B.A., architect to the London School Board, has awarded the first premium to Mr. John Hunt in the competition for the new Victoria Boys' School at Watford, and Mr. Hunt has been appointed to carry out the work. Three other competitors submitted designs, namely, Mr. C. P. Ayres, Messrs. Pridmore & Anderson, and Mr. W. H. Syme.

The Gloucester Hotel, Weymouth, was a favourite summer residence of King George III., and, although altered somewhat, the original bathroom used by the king, and the old kitchens in the "Gloucester," have been retained. The hotel has just been redecorated and refurnished throughout by Messrs. Oetzmann & Co., the well-known art furnishers, of 62–79, Hampstead Road, W. The drawing-room on the ground floor now has gilt furniture in Louis XV. style, while the coffee-room is in fumigated oak and apple-green morocco. The bedrooms, private sitting-rooms, and reading- and writing-rooms have Sheraton and Chippendale furniture, and the smoking-rooms are now treated in saddle-bags and red morocco. The hall is fitted with lounges.

Change of Address.—Mr. Walter Fullerton, architect and surveyor, has removed to 10, Leabourne Road, Clapton Common, N.

The Old Parish Church of St. Andrew, at Clewer, near Windsor, is to have its roof restored at a cost of about £400.

The Ancient Church of Marlston, in South Berkshire, has been restored and enlarged. An old Norman doorway which had been walled up has been opened out and a fine oaken door fixed.

Queen Elizabeth's School, Cranbrook, Kent, has been enlarged by the addition of new science buildings, containing laboratories and lecture theatres, at a cost of £1,000. Mr. Williams was the architect, and Messrs. Marshall & Son were the builders.

A New Parish Church at Llangeitho has been erected at a cost of £1,300, as the old building has become dilapidated, and did not boast of a chancel. The church was designed by Messrs. Williams, of Brecon, and built by Messrs. Evans & Co., of Llanddewibrefi. The main portion is of native stone, with Bath-stone dressings. It consists of a chancel, nave and aisles, and will seat about 200.

A New Congregational Church at Whetstone, near Barnet, has been opened at a corner of the New Southgate Road, Oakleigh Park. It is of red brick, with numbers of large round-topped windows, the entrance doors being flanked by two low, square towers, between which stands a large window. The interior is also of red brick, with a high wooden panelling stained in two colours of green. The seats and the open woodwork roofing are also stained light green. At the eastern end is an apse. The architect was Mr. E. F. Knight. The cost has been £6,000.

A New Police Station at Berwick has been erected on a site having a frontage to Church Street of nearly 70ft. The principal elevation is of polished sandstone, the roof being covered with red Staffordshire tiles. The design is Renaissance in character. The ground floor is occupied for the most part by the police station, and consists of charge-room, chief constable's office, parade-room and seven cells. Special attention has been given to the ventilation. The extraction of vitiated air in the court-room and cells is by means of a fan driven by a hot-air gas-engine. The design was selected in open competition in May, 1898, from thirty-seven competitive schemes. The work was started in June, 1899. Mr. Hugh Steel acted as clerk of works, the architects being Messrs. Cackett & Burns Dick, of Newcastle-on-Tyne. The cost of the new building was estimated at £4,945, exclusive of the site.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
June 21	Alves, Scotland—Additions	——	A. & W. Reid & Wittet, Architects. Elgin.
” 21	Basingstoke—Church, &c.	——	Rev. J. Beal, 15 Essex Road, Basingstoke.
” 21	Gillingham—Villa	——	Freame & Light, Gillingham.
” 21	St. Austell, Cornwall—Masonry Work, &c.	——	R. J. Vivyans, Moorland Road, St. Austell.
” 21	Hay—Shop	S. Williams	J. H. Phillips, Olive Chambers, Windsor Place, Cardiff.
” 21	Winchester—Alteratns. & Additns. to Public-houses, &c.	Messrs. Welsh & Co.	T. Stopher, 57 High Street, Winchester.
” 22	Bedlinog, Wales—Extensions	——	P. V. Jones, Architect, Hengoed.
” 22	Edinburgh—Works	School Board	Mr. Wilson, 3 Queen Street, Edinburgh.
” 22	Fentonladock, Cornwall—Cottage	——	H. C. Hotton, Fentonladock.
” 22	Lelant, Cornwall—Post Office	——	W. J. Ruberry, Post Office, Canonstown.
” 22	Omagh—Alterations	Union Guardians	J. L. Donnelly, Architect, Omagh.
” 22	Oswestry—Manse	——	Owen Pritchard, 15 Cross Street, Oswestry.
” 24	East Ham—School Buildings	School Board	R. L. Curtis, 120 London Wall, Moorgate Street, E.C.
” 24	Hereford—Alterations	Thomas Hooper	E. G. Davies, 6 St. John Street, Hereford.
” 24	Landulph, Hatt, Cornwall—Repairs	——	Rev. S. Gregory, Landulph, Hatt, R.S.O.
” 24	Morley—Dwellings	——	W. E. Putman, Borough Engineer, Town Hall, Morley.
” 24	Warkworth—House	Captain Leighton	J. Whightman-Douglas, 40 Bondgate, Alnwick.
” 24	Warrington—Buildings	Corporation	J. Dear, Municipal Offices, Warrington.
” 25	Walthamstow—School Buildings	School Board	G. E. T. Laurence, 22 Buckingham Street, Adelphi, W.C.
” 25	Abingdon—Wing at Roysses School	——	J. G. T. West, The Knowl, Abingdon.
” 25	Great Yarmouth—Additions	Electric Lighting Committee	J. W. Cockrill, Town Hall, Great Yarmouth.
” 25	Bradford—Converting	Merchants Association	Fairbank & Wall, Bank Street, Bradford.
” 25	Brighton—School	School Board (Urban District)	Thomas Simpson & Son, 16 Ship Street, Brighton.
” 25	Little Torrington—Farmhouse	J. C. M. Stevens	Groves, Cooper & Stapledon, Surveyors, Bideford.
” 25	Millom, Cumberland—School	School Board	W. T. Lawrence, Clerk, Millom.
” 25	Napsbury, St. Albans—Asylum	Middlesex County Asylum Committee	R. Plumbé, 13 Fitzroy Square, W.C.
” 26	Derby—Public Baths	Derby Corporation	J. Ward, Borough Surveyor, Babington Lane, Derby.
” 27	Brighton—Twenty-eight Dwelling-Houses	Corporation	F. J. C. May, Town Hall, Brighton.
” 27	Crowle—Alterations	——	J. H. Lee, Board Schools, Crowle, near Doncaster.
” 27	Norton, Yorks—Police Station	Standing Joint Committee	County Surveyor, Beverley.
” 27	Sowerby Bridge—Working Men's Club and Institute	——	S. Wilkinson, Architect, Sowerby Bridge.
” 29	Bardon Mill Bridge, Northumberland—Bdge. Widening	Northumberland County Council	J. A. Bean, Moot Hall, Newcastle.
” 29	Halifax—Houses	——	Mr. M. Hall, Architect, Halifax.
” 29	Willenhall—Bridge	Urban District Council	T. E. Fellows, Engineer, Town Hall, Willenhall.
” 29	Wrotham, Kent—Dwellings	Urban District Council	J. Sharp, 5 Sunnyside, Borough Green.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ENGINEERING:		
June	21	Belfast—Artesian Wells	Gas and Electric Committee	V. A. H. McCowen, City Electrical Engineer, Belfast.
,,	21	Chesterfield—Reservoir	Rural District Council	J. Frith, Barslow, via Chesterfield.
,,	21	Hereford—Culvert	Rural District Council	H. Bishop, Surveyor, Moreton-on-Lugg.
,,	22	Cleckheaton—Plant	Urban District Council	Gibbins & Baker, 17 Shaftesbury Avenue, London, W.
,,	22	Epsom—Meters	Urban District Council	E. J. Wilson, Clerk, High Street, Epsom.
,,	22	Goole—Mains	Urban District Council	C. J. Mellis, 264 Gresham House, Old Broad Street, E.C.
,,	22	Quainton, Bucks—Waterworks	Aylesbury Rural District Council	G. Luckett, 2 Church Street, Aylesbury.
,,	22	Witham, Essex—Sinking Boring	Urban District Council	W. B. Blood, Clerk to Council, Witham.
,,	22	Burnley—Waterworks	Rural District Council	E. Edmondson, 18 Nicholas Street, Burnley.
,,	24	Copenhagen—Steam Ferry	—	Statsbanernes, Söfartsafdeling, Reventlowsgad, 16 Copenhagen B.
,,	24	Erith, Kent—Plant	Urban District Council	The Clerk, Urban District Council, Erith.
,,	24	Haywards Heath, Sussex—Trial Boreings	Urban District Council	B. Latham, Parliament Mansions, Victoria Street, Westminster.
,,	25	Cairo—Engines, &c.	—	Inspector-General of Irrigation, Upper Egypt, Cairo.
,,	25	Bishop's Stortford—Repairs to Engines	Urban District Council	R. S. Scott, A.M.I.C.E., Bishop's Stortford.
,,	25	West Ham—Tramway Machinery	Town Council	J. K. Bock, Abbey Mills, West Ham.
,,	25	Barnsley—Pipelaying	Corporation	T. & C. Hawkesley, 30 Great George Street, Westminster, S.W.
,,	25	Glasgow—Purifiers	Corporation	W. Foulis, 45 John Street, Glasgow.
,,	25	Glasgow—Penstocks	Corporation	Office of Public Works, 64 Cochrane Street, Glasgow.
,,	25	Brighouse—Widening Line	Lancs and Yorks Railway Company	Engineer's Office, Hunt's Bank, Manchester.
,,	26	Bury, Lancs—Drainage, &c.	Health Committee	Pole & Little, 9 Gray's Inn Square, London, W.C.
,,	26	Knutsford—Steam Mains	Guardians Bucklow Union	R. J. M'Beath, Birnam House, Sale.
,,	27	Barnsley—Reservoirs	Corporation	T. & C. Hawkesley, 30 Great George Street, Westminster, S.W.
,,	27	Salisbury—Acetylene Gas Lighting	—	Harding & Son, Architects, High Street, Salisbury.
,,	28	Brewood, Staffs—Heating Church	Vicar	Rev. C. Dunkley, The Vicarage, Brewood.
,,	30	Nelson, Lancs—Conveyor Belt at Sewage Works	Sewage and Street Committee	B. Ball, Borough Engineer, Town Hall, Nelson.
July	1	London, S.E.—Electricity Meters, &c.	Bermondsey Borough Council	F. Ryall, Town Clerk, Town Hall, Spa Road, Bermondsey.
,,	2	Monaco—Jetty or Pier	Government	Commercial Department, Foreign Office, S.W.
,,	2	Westbourne Park, London—Widening Bridge, &c.	Great Western Railway	Engineer's Office, Paddington Station, W.
,,	4	London, N.E.—Mechanical Coaling Apparatus	Hackney Borough Council	R. Hammond, 64 Victoria Street, S.W.
,,	6	Lindfield—Bridge	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
,,	8	Edinburgh—Railway Tank Waggons	Gas Commissioners	W. R. Herring, Manager, New Street Works, Edinburgh.
,,	12	Mansfield—Electrical Plant	Corporation	R. Hammond, 64 Victoria Street, S.W.
Aug.	1	Manila—Harbour	—	Commercial Department, Foreign Office, Manila.
,,	16	Jassy—Supply of Water to Town	Communal Council	Communal Technical Department, Jassy.
Dec.	10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.
		IRON AND STEEL:		
June	22	Leigh, Lancs—Iron Pipes, Tubes, &c.	Gas and Water Committee	J. Foster, Gas Manager, Leigh.
,,	24	Newport, Mon.—Water Mains	Corporation	B. Latham, Parliament Mansions, Victoria Street, S.W.
,,	24	Leeds—Iron, Rivets, Shovels, Buckets, &c.	Gas Committee	R. H. Townsley, General Manager, Municipal Offices, Leeds.
,,	25	London, S.W.—Rails, Fish Plates, Spikes, &c.	Secretary of State for India	Director-General of Stores, India Office, Whitehall, S.W.
,,	26	London, E.C.—Iron, Tubes, Hinges, &c.	Madras Railway Company	J. Byrne, 61 New Broad Street, E.C.
,,	26	Christiania—Wire	—	Inspector of Telegraphs, No. 8 Stenersgade, Christiania.
,,	26	Manchester—Bolts and Nuts	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
July	1	Calcutta—Bins	Corporation	Chairman of Corporation, Calcutta.
,,	3	Millom, Cumberland—Pipes	Urban District Council	Surveyor, Council Offices, Millom.
,,	31	Sydney, N.S.W.—Rails	—	Agent-General for N.S.W., 9 Victoria Street, Westminster, S.W.
		PAINTING AND PLUMBING:		
June	21	Leeds—Painting, Colouring, &c.	School Board	W. Packer, Clerk, Board's Office, Leeds.
,,	22	Wakefield—Painting, Whitewashing, &c.	Workhouse Guardians	H. Beaumont, Clerk, Union Offices, Wakefield.
,,	24	Morley—Painting, &c. at Park and Cemetery	General Purposes Committee	W. E. Putman, Borough Engineer, Town Hall, Morley.
,,	24	Leeds—Lead, Varnish, Paints, &c.	Gas Committee	R. H. Townsley, Manager, Municipal Offices, Calveley Street, Leeds.
,,	26	Preston—Painting, &c. Railings	Corporation	Borough Surveyor, Town Hall, Preston.
,,	26	Manchester—Oils, Paints, &c.	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
Aug.	5	Cleckheaton—Interior Renovation of Church	—	Wesleyan Church, Whitcliffe Road, Cleckheaton.
		ROADS AND CARTAGE:		
June	21	Beverley—Road Works	Corporation	Borough Surveyor, Guildhall, Beverley.
,,	21	Horncastle, Lincs—Granite	Urban District Council	S. G. Overton, 2, Man House Street, Horncastle.
,,	22	New Shoreham, Sussex—Kerb	Urban District Council	J. E. Brown, Clerk, Council's Offices, New Shoreham.
,,	24	Burgess Hill, Sussex—Flints	Urban District Council	Clerk to Council, Burgess Hill.
,,	24	East Ham—Tar Paving	School Board	S. Jackson, 65 Fenchurch Street, E.C.
,,	24	Wokingham—Road	Investment Co., Ltd.	J. F. Sargeant, Secretary, Wokingham.
,,	24	Lewes—Steam Rolling	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
,,	25	Shrewsbury—Concrete Flags	Improvement Committee	W. C. Eddowes, Borough Surveyor, The Square Shrewsbury.
,,	25	Tantobie, Durham—Street Works	Urban District Council	R. Heslop, Surveyor, Burnsfield, R.S.O.
,,	25	Amble—Widening, &c.	Urban District Council	W. Gibson, Surveyor, Amble.
,,	26	Dartford, Kent—Paving, &c.	Urban District Council	W. Harston, Surveyor, High Street, Dartford.
,,	26	Wigan—Materials	Corporation	W. Bolton, Borough Engineer, Municipal Offices, Wigan.
,,	26	Lewes—Materials	Town Council	Borough Surveyor, Town Hall, Lewes.
,,	28	Branksome, Dorset—Granite	Urban District Council	S. J. Newman, 3 Tennyson Bdgs., Ashley Rd., Branksome, Parkstone.
,,	29	Ashton-in-Makerfield—Kerbs, Flags, &c.	Urban District Council	J. W. Liversedge, Srvyr., Cncl. Offics., Byron St., Ashton-in-Makerfield.
July	1	London, S.E.—Six Slop Vans and two Material Carts	Bermondsey Borough Council	R. J. Angel, Borough Surveyor, Town Hall, Spa Road, S.E.

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COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	SANITARY:		
June 21	Sutton Coldfield—Sewers, &c.	Corporation	W. A. H. Clarey, Engineer & Surveyor, Town Hall, Sutton Coldfield.
„ 22	Alford, Lincs—Sewers, &c.	Urban District Council	F. Massie, Tetley House, Wakefield.
„ 22	Surbiton—Sewer, &c.	Urban District Council	J. Bell, Clerk, Council Offices, Ewell Road, Surbiton.
„ 24	Nuneaton—Sewage Works	Urban District Council	J. S. Pickering, Surveyor, Council Offices, Nuneaton.
„ 24	Ongar, Essex—Drainage	Rural District Council	W. N. Jarvis, Surveyor, Council House, Ongar.
„ 24	West End, near Southampton—Drainage Work	Guardians	W. H. Mitchell, Son & Gutteridge, 9, Portland Street, Southampton.
„ 25	Strathaven, Scotland—Sewage Works	District Committee	W. L. Douglass, 3 Clydesdale Street, Hamilton.
„ 25	Beckton, North Woolwich—Removal of Refuse	London County Council	Superintendent, Outfall Works, Beckton.
„ 25	Walsall—Sewers	Corporation	Borough Surveyor, Bridge Street, Walsall.
„ 26	Manchester—Lime	Gas Committee	C. Nickson, Gas Department, Town Hall, Manchester.
„ 27	Swannington, Leicester—Laying Sewer, &c.	Parish Council	G. Rowse, Clerk, Council Offices, Swannington, Leicester.
„ 27	Winslow—Sewers, &c.	Rural District Council	J. Taylor, Sons & S. Crimp, 27 Great George Street, Westminster.
July 1	Hemel Hempstead—Sewerage Works	Rural District Council	W. H. Radford, Albion Chambers, King Street, Nottingham.
„ 2	Enniskillen—Sewerage System	Rural District Council	R. Wilson, Clerk, Workhouse, Enniskillen.
„ 3	Erdington, near Birmingham—Sewerage Works	Urban District Council	H. H. Humphries, Surveyor, Public Hall, Erdington, Birmingham.
„ 3	Millom—Extension of Sewer	Urban District Council	W. T. Lawrence, Clerk, Council Offices, Millom.
	TIMBER:		
June 25	Cardiff—Hardwood	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
June 24	Manchester—Fire Station, Police Station and Buildings	£300, £200, and £100	W. H. Talbot, Town Clerk, Town Hall, Manchester.
„ 24	Trowbridge—Hospital	£20, £10	W. J. Mann, Clerk to the Joint Committee, Union Street, Trowbridge.
„ 30	Hereford—Municipal Buildings	£100, £75, £50	J. Carless, Offa Street, Hereford.
July 31	Manchester—Fire Station and Police Station	£300, £200 and £100	W. H. Talbot, Town Hall, Manchester.
Aug. 1	Egremont, Cumbrld.—Alteration of Property in Main St.	—	J. Lowery, 59 Main Street, Egremont.

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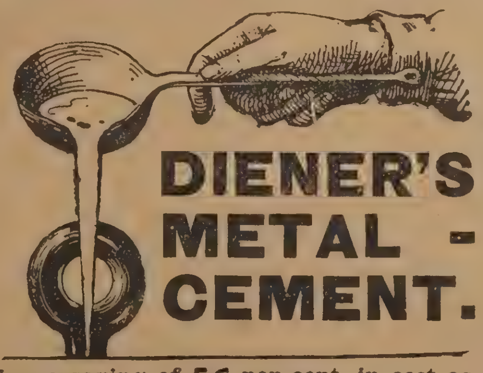
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COMING EVENTS.

Wednesday, June 19.

GEOLOGICAL SOCIETY OF LONDON.—Meeting at 8 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Conversazione at 9 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Ordinary Meeting at 8 p.m.

Thursday, June 20.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

CHEMICAL SOCIETY.—Meeting at 8 p.m.

Friday, June 21.

ROYAL ARCHITECTURAL MUSEUM AND WESTMINSTER SCHOOL OF ART.—Mr. William Emerson, F.R.I.B.A., presides at the annual meeting at 4 p.m.

Saturday, June 22.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Visit to Hampton Court Palace at 3 p.m.

Wednesday, June 26.

NATIONAL TRUST FOR PLACES OF HISTORIC INTEREST OR NATURAL BEAUTY.—Annual Meeting at the Royal United Service Institution at 4 p.m.

Trade and Craft.

Anaglypta at the Glasgow Exhibition.

The Anaglypta Branch of the Wall-Paper Manufacturers, Ltd., have an interesting exhibit (No. 314) at the Glasgow Exhibition, in the right and left corners of the Bridge (Machinery Hall end) leading from the long gallery to the Machinery Hall, the space on each side giving two walls and a 15ft. square ceiling. The examples shown on one side are as follows: Two different forms of wainscot panelling, treated in black oak colour. Above one is a filling, in modern style, designed by Mr. George C. Haité, and finished by paint and glazes in a quiet leather treatment. Above the other wainscot is a design by Mr. O. P. Moller, finished in a contrasting metal treatment, having the general effect of an old leather decoration. Upon the ceiling is fixed a bold ceiling, designed by Mr. O. P. Moller, and finished with framing mould in Anaglypta following the cornice line. The ceiling is painted and flatted in plaster white. In the other corner of the bridge the examples shown are: A design composed of a peacock and some decorative forms in modern style, finished in a rich decoration upon metal leaf. Above this filling is an original frieze, decorated on metal leaf in contrast to the filling. Below the filling is a simple wainscot panel dado, treated in dark oak colour. Next to these decorations is a filling by Mr. A. Jonquet. A Louis XVI. frieze and a Louis XV. frieze, a filling in Louis XV. and XVI., by Mr. Owen W. Davis, architect, are shown, and a filling, in modern style, by Mr. George C. Haité, above which is a frieze decoration in modern style, decorated in metal effect, with suitable lacquer, glaze and paint colours. Below the filling is another example and form of wainscot dado finished in dark oak. The ceiling is a pure Louis XV. decoration of corners and intermediate connecting pieces, finished with paint and flat in plaster colour. This ceiling may be used on any sized ceiling with flanks of not less than 13ft., and not necessarily a square ceiling. Outside (right and left hand) of the two corner spaces above described are two walls upon which are temporarily fixed various examples of frieze decorations, some finished in colours, and some left in plaster white. Below these are two dado decorations—one by Mr. O. P. Moller, in modern style, finished in copper metal effects; and the other, by Mr. A. Jonquet, in Francois I., finished in wood effect, and two dados—one, an Arabian panel design by Dr. C. Dresser, finished in reddish wood colour; and the other, by S. Moutrie, a wood panel effect, finished in wood colour. Besides the foregoing fixed decorations, there are pattern stands of other samples of work, photo-litho books illustrating different productions, and photos of the ceiling produced in Anaglypta and fixed in the Royal Pavilion at the Paris Exhibition last year; also photos of the Anaglypta Exhibit at the Paris Exhibition, for which work two gold medals were awarded.

A New Parish Hall at Waterloo attached to St. Mary's Church has been erected. The building is of red sandstone, dressed with Cefn stone, and the interior of buff and red bricks, and will provide seating accommodation for about 250 people. The fittings are of pitch-pine. The old choir vestry has been converted into a clergy vestry. During the past twelve months the church grounds have been laid out with flowers and enclosed. The cost of carrying out these improvements has amounted to about £1,700.

Drury Lane Theatre is to be altered so as to give additional seating accommodation. Various other improvements in the auditorium are also to be carried out. As at present arranged, the four pit tier boxes will be removed and their places taken by stalls on a greatly improved plan, the seats being ranged in the segment of a circle, there being four gangways instead of two as previously. The grand circle and first circle are also to be enlarged, and the two inconvenient little boxes at the side of the proscenium will be made into large stage boxes.

Mr. John A. Russell Inglis, of the firm of Messrs. Williamson & Inglis, architects, Edinburgh and Kirkcaldy, died in Edinburgh last week from an overdose of a sleeping draught, it is supposed. Mr. Inglis was a young man, and commenced his professional career with Mr. James B. Dunn, architect, Edinburgh, afterwards going to London to continue his studies. While in London he was successful in gaining the Soane medallion, which entitled him to a travelling studentship for six months in Italy and Sicily. After three years' study in Oxford he returned to Scotland and assumed partnership with Mr. William Williamson, architect.

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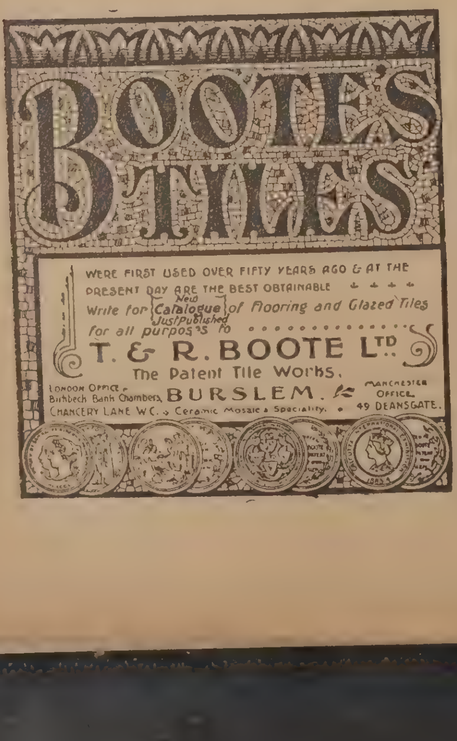

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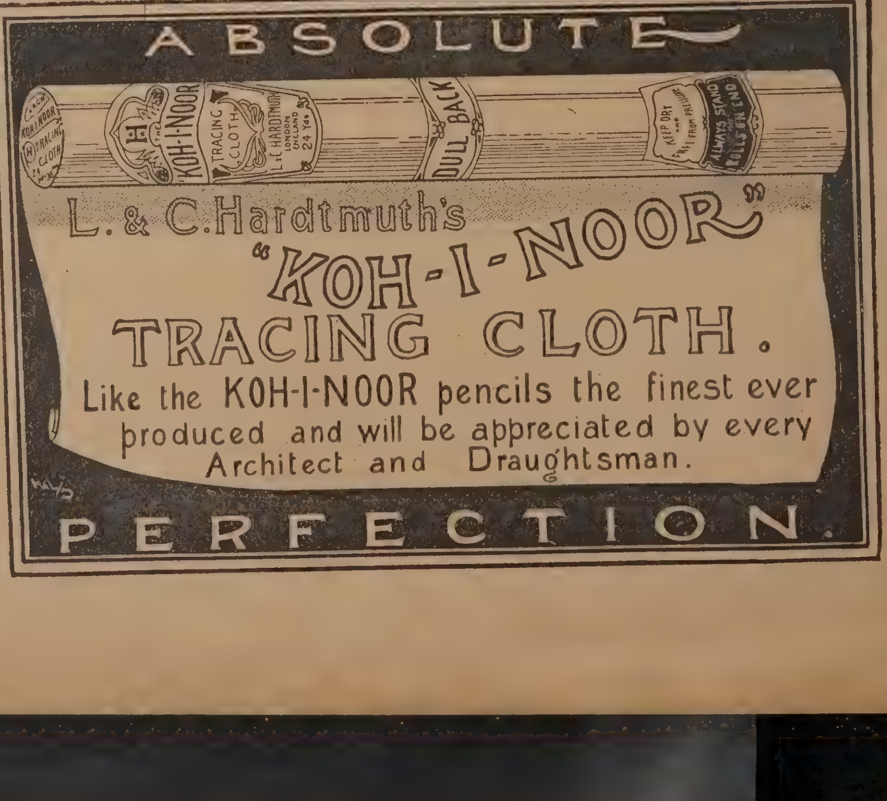

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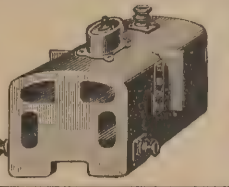

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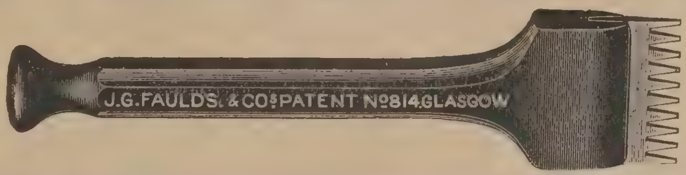
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W. Watson	7,985	Courtney & Fairbairn	6,751
Bottrill & Son	7,842	J. Brown	6,741
H. Charman	7,150	W. J. May*	6,250
Spear & King	7,075		

* Accepted.

BROMLEY (KENT).—For the erection of new wards at their hospital for infectious diseases, situate at Skym Corner, Bromley Common, Kent, for the Bromley and Beckenham Joint Hospital Board. Mr. John Ladds, architect, 7 Doughty Street, Mecklenburgh Square, London, W.C.:—

T. T. Turner & Co., Walmer	£8,053 8
F. W. Green, Beckenham	7,280 0
G. E. Wallis & Sons, Maidstone	6,563 0
J. J. Wise, Deal	6,404 0
J. Christie, 2 Richmond Road, London	6,205 0
J. Lonsdale, Swanley Junction, Kent	6,113 0
T. D. Graty, Bromley, Kent	6,066 0
W. Smith & Sons, 202 London Road, Croydon	5,998 10

EASTBOURNE.—For sanatorium extension:—

Original estimates.

Gregar & Co., Stratford, E.	£9,444
Johnson & Co., Leicester	9,443
J. C. Lacey, Eastbourne	8,862
Martin, Wells, & Co., Aldershot	8,669
C. P. Dennis & Co., Eastbourne	8,483
Tapner & Co., Hastings	8,364
M. Hookham, Eastbourne	7,990

Amended tenders.

Gregar & Co.	8,434
Johnson & Co.	8,252
J. C. Lacey	7,940
Tapner & Co.	7,723
Martin, Wells, & Co.	7,679
C. P. Dennis & Co.	7,316
M. Hookham*	7,108

* Accepted.

HANLEY (STAFFS.).—For the excavation and construction of sewage tank No. 6, capacity 500,000 gallons, at Trent Hay Sewage Works, Leek Road, Hanley. Messrs. Wilcox & Raikes, engineers, Union Chambers, 63 Temple Row, Birmingham:—

	£	s.	d.
T. Tucker, Newcastle Street, Burslem	£2,554	0	0
H. Weldon, Birmingham	1,986	11	9
C. J. Nevitt, Stafford	1,811	0	0
F. Barke, Stoke-on-Trent	1,784	16	0
W. Williams,* Etruria, Stoke-on-Trent	1,560	0	0

*Accepted.

LEYTON (ESSEX).—For making-up, paving, and kerbing certain private streets within their district, for the Leyton Urban District Council. Mr. William Dawson, M.I.C.E., surveyor:—

	£	s.	d.
Myers, Gilson, & Rose, Ltd., Tottenham Lane, Hornsey	£14,647	7	8
D. T. Jackson, Ripple Road, Barking	14,574	6	6
T. Adams, Green Lanes Station, Wood Green, N.	13,057	3	2
G. Wilson, Westbury Road, Walthamstow, E.	12,383	8	6
G. Porter, 2 Arthur Street, Well Street, Hackney	12,193	12	1
G. J. Anderson, 26 North Street, Poplar	11,951	7	6
W. Griffiths, Ltd., 35-9 Hamilton House, London	11,908	11	10
W. Manders,* Leyton	11,836	19	6

* Accepted.

LONDON, E.C.—For erection of shops and offices, Middlesex Street, E.C. Messrs. Dale & Gadsdon, architects, 8 Union Court, Old Broad Street, E.C.:—

Symes	£4,740	Williams	£4,587
Adamson	4,710	Perry Bros.	4,557
Hoare & Son	4,670	Sharpe*	4,452
Gladding	4,650		

* Accepted.

LONDON, N.W.—For the erection of a branch public library in Cotleigh Road, Kilburn, for the Hampstead Borough Council. Mr. C. H. Lowe, M.I.C.E., borough surveyor:—

Foster Bros., 148 Birchanger Road, Norwood, S.W.	£3,047
Barker & Co., High Street, Kensington	2,910
F. Almond, Ponders End, Middlesex	2,795
Oldrey & Sons, 1 West End Lane, N.W.	2,747
Chessum & Sons, Crown Wharf, Monier Road, Bow, E.	2,730
General Builders, Ltd., Progress Works, Wharf Road, Notting Hill, W.	2,697
J. & M. Patrick, Point Pleasant, Wandsworth, S.W.	2,686
J. Gibb & Co., 191 West End Lane, Hampstead, N.W.	2,585
F. E. Mitchell & Co., 108–112 Drummond Street, Euston Road, N.W.	2,494
J. Christie,* 2 Richmond Road, Uxbridge Road, W.	2,400
J. Allen & Sons, Kilburn, N.W. (informal)	2,365

* Accepted.

NORTH SHIELDS.—For the erection of a new Conservative Club on Albion Road, North Shields, for the Tynemouth Conservative Club Company, Ltd. Mr. F. R. N. Haswell, F.R.I.B.A., architect, Tyne Street, North Shields:—

R. Langlands, Tynemouth	£4,595
J. & W. Simpson, North Shields and Blyth	4,400
W. T. Weir,* Howden, Newcastle-on-Tyne	4,300

* Accepted.

RADSTOCK (SOMERSET).—For the erection of Primitive Methodist Chapel, Radstock. Mr. W. J. Willcox, architect, 1 Belmont, Bath:—

Chancellor & Sons, Bath	£2,940
Long & Sons, Bath	2,888
Erwood & Morris, Bath	2,869
Webb, Bath	2,772
Keeling, Timsbury	2,750
Dodimead, Shepton Mallet	2,750
Wills & Son, Bath	2,745
Catley, Midsomer Norton	2,710
Foster, Radstock	2,666
Bird, Radstock	2,650
Hayward & Wooster, Bath	2,549
Wibley, Bath	2,443
Huish, Street	2,432
Hodder & Sons,* Frome	2,400

* Accepted.

SALISBURY.—For the erection of refuse destructor buildings, for the Salisbury Urban Sanitary Authority. Mr. Alfred C. Bothams, A.M.I.C.E., assistant city surveyor:—

Hale	£1,500	Hawkins	£1,390
Wort & Way	1,488	Kite & Son*	1,356
Dawkins	1,343		

* Accepted.

WOOLWICH.—For electricity and destructor station, for the Woolwich Borough Council:—

Foundations.

E. Proctor, Woolwich	£8,229
J. E. Johnson & Son, London	7,710
T. G. Minter, London	7,107
Foster Bros., London	7,087
D. Gibb & Co, London	7,052
W. Lawrence & Son, London	6,999
Martin, Wells, & Co., London	6,984
T. D. Leng, London	6,920
J. Parnell & Son, Rugby	6,800
Thomas & Edge, Woolwich	6,727
H. L. Holloway, London	6,500
J. Chessum & Sons, London	6,480
Smith & Son,* London	6,437
Leslie & Co., Ltd., London	6,384

Station.

E. Proctor	£39,518
D. Gibb & Co.	38,300
Martin, Wells, & Co.	38,074
W. Lawrence & Son	37,999
Foster Bros.	37,760
Leslie & Co., Ltd.	37,641
J. Parnell & Son	37,300
Thomas & Edge	37,108
T. D. Leng	36,650
H. L. Holloway	35,990
J. Chessum & Sons	35,336
J. E. Johnson & Son	33,589
T. G. Minter	33,568
Smith & Son*	34,137

Extra if Portland stone.

	£	s.	d.
Martin, Wells, & Co.	£313	0	0
J. Chessum & Sons	220	10	0
J. E. Johnson & Son	175	7	3
J. Parnell & Son	120	0	0
T. D. Leng	120	0	0
D. Gibb & Co.	110	0	0
W. Lawrence & Son	100	0	0
Thomas & Edge	100	0	0
T. G. Minter	100	0	0
Leslie & Co., Ltd.	36	0	0

Saving if terra-cotta.

	£	s.	d.
Leslie & Co., Ltd.	£596	0	0
E. Proctor	524	0	0
T. G. Minter	470	0	0
H. L. Holloway	440	0	0
D. Gibb & Co.	416	0	0
Smith & Son*	400	0	0
W. Lawrence & Son	400	0	0
Foster Bros.	400	0	0
Thomas & Edge	400	0	0
T. D. Leng	394	0	0
J. Parnell & Son	380	0	0
J. Chessum & Sons	220	0	0
Martin, Wells, & Co.	216	0	0
J. E. Johnson & Son	178	2	8

* Accepted.

TUTBURY.—For the erection and completion of manager's and foreman's houses and four cottages at Tutbury, for Mr. Henry Newton, Burton-on-Trent. Mr. R. Stevenson, architect, Imperial Chambers, High Street, Burton-on-Trent. Quantities by the architect:—

	£	s.	d.		£	s.	d.
H. Edwards	£2,402	0	0	R. Kershaw	£2,199	0	0
G. Hodges	2,252	0	0	W. Gould (Tutbury)	2,190	9	6
W. A. Stevenson	2,231	0	0	T. Lowe & Sons*	2,185	0	0

* Accepted.

[Rest of Burton-on-Trent.]

CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	7	6		—	
Clover, best	per load	4	5	0	5	2	6
Hay, best	do.	4	7	0	4	17	6
Sainfoin mixture	do.	3	15	0	4	12	6
Straw	do.	1	8	0	1	16	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	8	0	1	8	7
Colza Oil, English	do.	1	7	9		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	3	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels	do.	1	12	3		—	
Petroleum, American	per gal.	0	0	5¾	0	0	5⅞
Do. Russian	do.	0	0	4⅞	0	0	5
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	3	0	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	4	6	1	5	3
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	1	6	4½		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	85	0	0		—	
Iron, Staffs., bar	do.	6	2	6	8	10	0
Do. Galvanised Corrugated sheet	do.	11	10	0	11	15	0
Lead, pig, Spanish	per ton	12	6	3		—	
Do. do. English common brands	do.	12	15	0		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do. floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	0	0	6	5	0
Do. Mild Bars	do.	7	0	0	7	10	0
Tin, Foreign	do.	129	15	0	130	5	0
Do. English ingots	do.	132	0	0	132	10	0
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	17	7	6	18	0	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Pine, Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P.Std.	10	0	0	12	10	0
Do. do. 4th & 3rd	do.	8	0	0		—	
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	21	0	0		—	
Do. do. 2nd "	do.	19	0	0		—	
Do. do. unsorted	do.	11	0	0		—	
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	8	0	0	10	5	0
Do. White Sea	do.	9	15	0	13	0	0

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EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

JUNE 26, 1901.
No. CCCXXXIII.

EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

EVERY WEDNESDAY, PRICE 2D.

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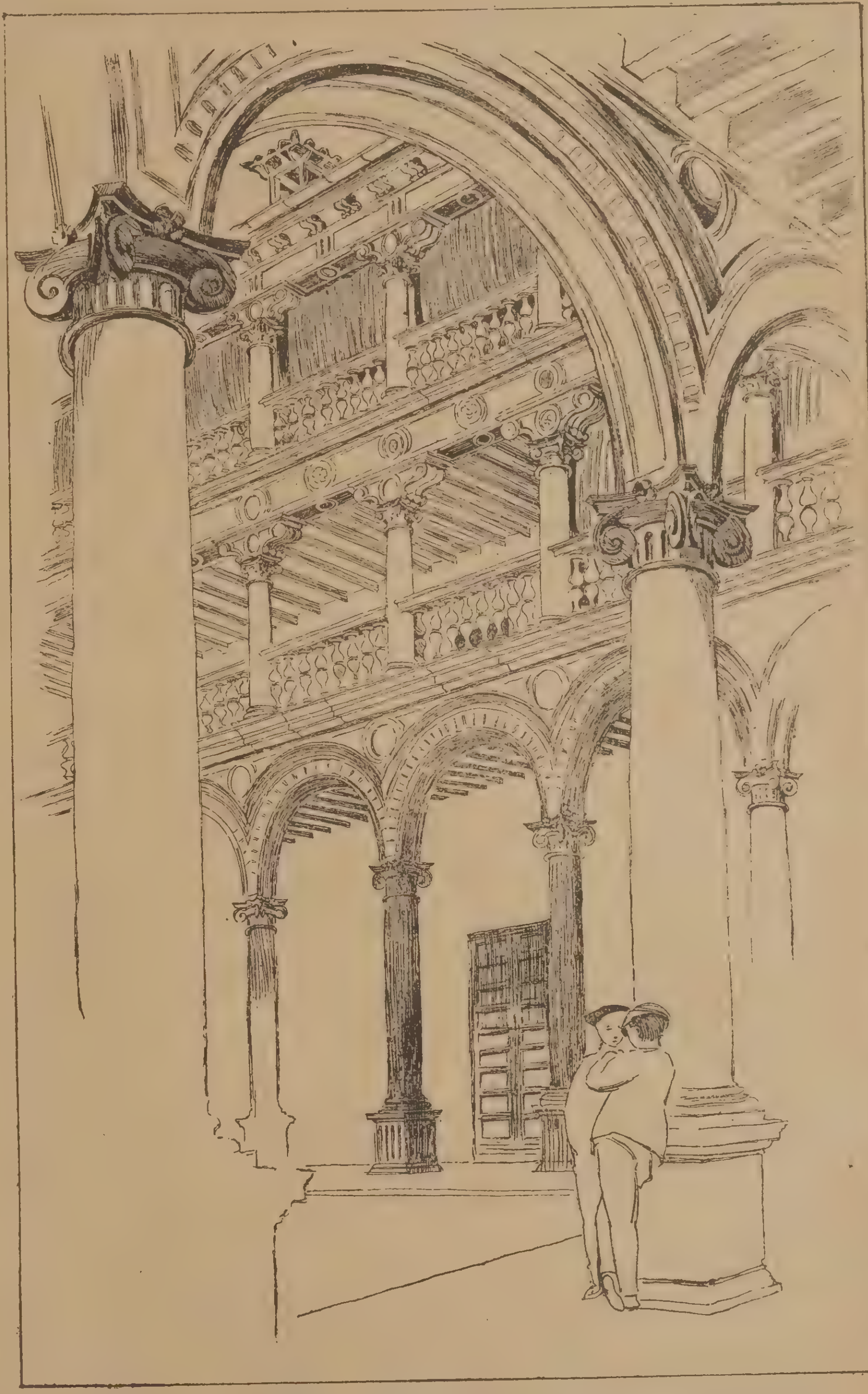
An Architectural Causerie.

Waterloo Bridge. THOSE who have occasion to frequently cross a bridge spanning the river that runs through the heart of a city will have taken special pleasure in watching the varying aspects of the surrounding buildings under changes of light and air, in fog and sunshine, rain, frost and snow. The main bridges of London are specially capable of affording this pleasure, and Waterloo Bridge, perhaps, the most of all, because it commands a more extensive view of the great buildings of the city than any other. Crossing from the Surrey side one notices to the right, first, Somerset House, its stonework now weathered white with more than a century's exposure (for it is so long ago as 1776 since Sir William Chambers commenced it, the wings being added by Smirke & Pennethorne); then the group of dark-red brick buildings built by John Dunn, with their flowing Gothic ornament, Tudor windows, and gargoyles, in strange contrast to the classical Government building; still further east, the London School Board offices, a medley of glass and pediments, very displeasing at close quarters, but not without enchantment at this distance; next to it the late J. L. Pearson's office of the Astor estate, with its neat Perpendicular windows and handsome railings, the roof crowned by a weather-vane of a ship under sail, and the small side garden exhibiting the hand of a master in its wonderfully skilful treatment; next to this, and standing a little forward, in the region

> "Where now the studious lawyers have their bowers,
> There whilom wont the Templar Knights to bide,
> Till they decayed through pride,"

Savage's stone library, with its grotesque angry animals always about to spring on the passer-by from their places on the walls; eastwards again, the New Paper Buildings in the Temple grounds (built by Sydney Smirke), now white like Somerset House and recalling the "bricky towers" of Spenser's Prothalamion; then the three great office buildings just completed from the designs of Mr. William Emerson, Mr. A. T. Bromley and Mr. E. T. Hall (all three were illustrated in our last issue); then a fine building by the late Sir Arthur Blomfield—Sion College; then, its long spirelet standing up against the sky, the City of London School, followed by a miscellaneous collection of buildings; and then the great dome of St. Paul's dominating the whole, just as Brunelleschi's dome draws the eye from all Florence. Further to the right one may perceive the ugly roof of Cannon Street Station, then London's ancient fortress, and, perhaps, the Tower Bridge itself. Thus the view extends along the Thames front, with the Embankment wall as a factor of strength in the foreground; while behind and above the roofs one catches glimpses of other buildings farther away—the white spires of city churches, the towers of the Record Office and of Street's Law Courts, and a sea of chimneys. This, one sees to the right of the bridge. To the left lie the Savoy and Cecil Hotels, the former a hopeless mixture of columns and balconies; then the stately terrace of the Brothers Adam adjacent to no less inappropriate a thing than the curved roof of Charing Cross Station; next Whitehall Court, a familiar and pleasing skyline; then two great Government buildings—New Scotland Yard and the Houses of Parliament, both in marked contrast; and, lastly, the towers of Westminster. One sees four bridges—the two at Blackfriars, so muddled that they appear as one ungainly structure; Charing Cross Bridge, with its ugly piers and decorations like gas jets; and Westminster Bridge. This view from Waterloo Bridge (which, by the way, is the most handsome of the city's bridges) always fascinates and is always fresh, for the buildings and the water are never seen under exactly similar conditions, and this variety is a constant charm to the eye.



PATIO OF THE HOSPITAL, TOLEDO, SPAIN. DRAWN BY A. N. PRENTICE.

The Fate of Christ's Hospital. LAST Friday in the House of Commons the postponed discussion on the Christ's Hospital Bill took place, but, despite the strenuous efforts of Mr. Richards and Lord Balcarres, there was a majority of 108 against an instruction to the Committee to consider how the site could be dealt with in order to prevent its being covered with business premises. The standpoint of the Governors seems to be that of the fatalist. The total amount needed by them is £940,000, and against this they have stock worth £177,000 and a firm offer of £720,000 for the site. These are plain facts, but we think that if the Governors had taken a less fatalistic view of things some arrangement could have been arrived at. There now appears to be little hope for the celebrated old buildings.

MEN WHO BUILD.

No. 64.—Mr. A. N. PRENTICE.

OF recent years it may safely be said that considerable progress has been made respecting the general education of architects in matters of taste; and among the younger men there is a large number of talented artists who, however much it may be objected that they do not produce living architecture nor that they possibly could under the present conditions, do produce work which has a value—negative though it may be thought—as regards simplicity and general refinement. For this there are several reasons, among which are the attention directed to drawing, painting and modelling, and other branches in what are called the "Fine Arts"; architectural examinations; and the study of old work from its sketchable side. The "styles" have been abandoned, and we have now in its place a striving after originality, fostered doubtless partially by this study of outward appearances. Though this originality has led to many atrocities, it has created independence and thought, and our younger men are not afraid of venturing away from the leading-strings of the "styles"; and this very independence has made them more careful of their effects and forced them to rely upon their artistic judgment more than upon their archæology. Of course, this is productive of all that self-consciousness so criticised in artists, and it merely argues for graphic design in contradistinction to the traditionary and condition-produced character of ancient architecture; yet, in the present state of affairs, nothing else can be done. If the conditions are altered in the future, and it is most probable they will be, then we should be right in expecting something else, but to-day we can but ask that the architect should be an artist as well as a practical man.

Among the foremost and best of the younger men is Mr. A. N. Prentice, whose work has been so much admired for several years past. Although Mr. Prentice is such a fine artist, he has this distinguishing quality above the majority of his fellows, that he uses his materials in a workmanlike and scientific manner. It is well enough to ask for artistic neat designs, but unless these also exhibit good construction, logical expression, and a clear understanding of the principles of architectural design, there will surely be failure and dissatisfaction with the work. We cannot pardon ignorance, and although by accident much is often done that is fairly pleasing, yet on the sum total we clearly perceive the true value. If the materials to be worked with and the requirements are not studied, no matter what the art is, the result cannot but be bad. Though the principle of "functional expression," as it has been called, is of course well known to all with any pretensions to architectural knowledge, one may say that comparatively few recognise the full significance of it, and this want of knowledge among the great mass of the profession is one of the most deplorable facts of the moment; the admirable suggestive essays of Viollet-le-Duc, in particular, being seldom read.

Mr. Prentice is one of those who have read Viollet-le-Duc's writings, and not only has he found them useful in the study of old work, but they have plainly helped him in his perceptive and logical work, which is so free from the offence (even in small things) to be found in the work of other architects who bulk largely in the public view just at present.

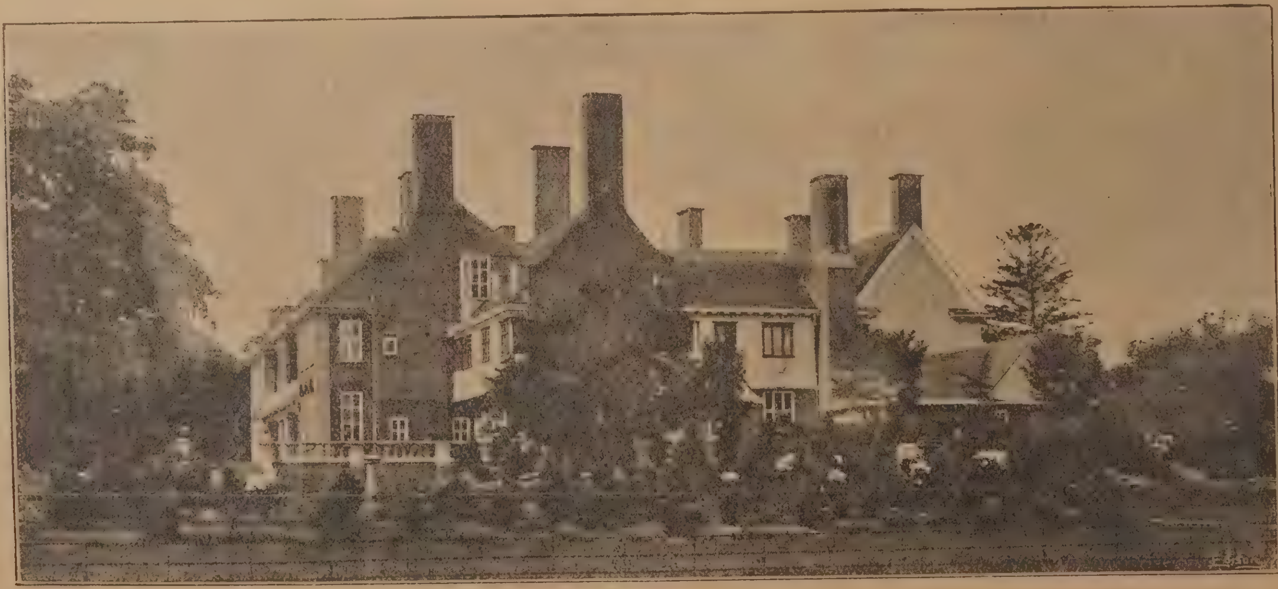
Mr. A. N. Prentice was born on April 20th, 1866, at Greenock, N.B., and studied at Glasgow University with the intention of going to the Ecole des Beaux-Arts at Paris, but ultimately he entered the office of Mr. William Leiper, R.S.A., as a pupil, and remained there till 1888, when he gained the Soane Medallion for a design for a gentleman's country house, which showed very considerable merit and was highly spoken of at the time. On this, he travelled for six months in Sicily and Italy as Soane Medallist, and afterwards in France, returning home in the summer of 1889. In the autumn of the same year he set out for a trip to Athens and the East, but on the advice of Mr. R. Phené Spiers changed his plans and set out for Spain to study Spanish architecture. He returned from Spain in June, 1890, after an eight months' tour, and then entered the office of Mr. T. E. Collcutt, F.R.I.B.A., being with him till May, 1892, when he returned to Spain for four months. As a result of these Spanish travels, Mr. B. T. Batsford published in 1893 Mr. Prentice's book on "Renaissance Architecture and Ornament in Spain," which met with such an appreciation that it was quickly sold out, and its influence is to be considerably noticed in the detail of many architects' designs of the last few years. One of the drawings intended for this work, but not used, is published for the first time in connection with this article, and shows the accuracy and grasp of essentials Mr. Prentice has and his command of drawing detail. Previous to going to Spain for the second time, he qualified as an Associate of the Royal Institute of British Architects in 1891. He started practice as an architect in 1893 at Hastings House, Norfolk Street, Strand, W.C., and has since been actively engaged with works chiefly of a domestic character.

MR. A. N. PRENTICE.

The largest and most important work Mr. Prentice has carried out is Cavenham Hall, Suffolk, for the late Mr. H. E. M. Davies, which, with the stables, &c., cost more than £30,000. We now give several views of this delightful example of domestic work, with its stables and the interesting fountain in the garden, which has lead ornaments on it modelled by Mr. A. Broadbent, a rising young sculptor. We may specially refer to the remarkably successful treatment of the large conservatory to this house—most difficult to treat successfully.

Another large house executed from Mr. Prentice's designs is that at Lakenheath, Suffolk, for Sir William Dunn, Bart., M.P., of which we give two views from water-colour drawings by the architect. Mr. Prentice has also erected Fryerne House, Caterham; houses at Pinner, Bedford, Reigate and Broadway; and has carried out alterations to numerous houses in London, among which may be mentioned 33, Bruton Street, for Mr. H. J. Tennant, M.P. He also altered Bolney House for Mr. Henry Tate; Bohun Lodge, Barnet; and 37, First Avenue, Brighton, for Mr. W. B. Chamberlain; and in Scotland carried out alterations to Park Circus, Glasgow, for Mr. P. M. Inglis, where there is an interesting room carried out in Dutch style (included among the accompanying illustrations), containing bookcases covered—in a somewhat novel manner—all over with red morocco leather, with the windows backed by iron grilles specially designed by Mr. Prentice. A new drawing-room, &c., for Mr. W. H. Curtis at Greenock has also been built from Mr. Prentice's designs. Among his most recent works are a new house for Dr. Mathieson at Donne, and a kiosk for Messrs. Van Houten & Sons in the grounds of the Glasgow Exhibition. This latter is not quite so happy in effect as the other work, the plasterwork especially being somewhat too rococo. The walls are constructed entirely of plaster, the interior not being wood-panelled as might be supposed from the photograph. This architect has also laid out a large estate at Reigate.

Mr. Prentice is a strong believer in competitions, but, owing to pressure of work, has not engaged in any for the last few years. He



CAVENHAM HALL, SUFFOLK: NORTH-EAST VIEW. A. N. PRENTICE, ARCHITECT.

CAVENHAM HALL, SUFFOLK: GARDEN FRONT.

submitted designs for the Cardiff Town Hall and Law Courts; and a Spanish design of his for the Glasgow Art Galleries was highly spoken of. He also submitted designs for the Sunderland Schools and Durham County Buildings, in conjunction with Mr. A. T. Bolton, and for the Liverpool Technical Institute and Royal Insurance Offices in collaboration with Mr. T. E. Collcutt. None of these, however, was awarded first premium.

Mr. Prentice has also given much time to the study of metal work (especially in Spain), and has made numerous designs for the leading metal workers of the day. He holds the opinion that much more could be done in the construction and decoration of London Street fronts in this material, if the Building Act would allow it.

As a draughtsman it is unnecessary to speak of Mr. Prentice's ability; we give several examples in this issue illustrative of his style in line, pencil, wash and water-colours. He makes all his own perspective drawings, which are frequently exhibited at the Royal Academy, besides making his own half-inch and full-size working drawings. And this, no doubt, has led to the success of his designs; for, having made such study of perspective representation and measured drawing of old work, he would be better qualified to judge the actual look of a feature when erected than draughtsmen possessing less knowledge.

Mr. Prentice has his ideals, as everyone should have, if he is to do anything of value in art. One of these is, that he does not feel inclined to enter into the controversies waged so vigorously among architects, but thinks that it would be better if there were less talk, and more done—a sensible proposal that might advantageously be followed by others. There is far too much talk from those who by example are the least likely to be followed.

CAVENHAM HALL: FOUNTAIN IN GARDEN.

WHY SOME HOUSES ARE GOOD.

THE most important qualities that enter into the design of a house are care and fitness. Care means thorough attention to everything; fitness signifies suitability and adaptability. The building of a house is a complicated process, requiring the services of many men, and utilising the products of many industries. It is a work that no one goes about thoughtlessly; and yet all the world knows many houses are designed and built in a careless manner, and without that thorough attention to every detail that the importance of the undertaking should command as a matter of course. For carelessness in building is very far from meaning indifference in construction; that, indeed, is a special carelessness that is punishable by law; but there is a vast quantity of carelessness in house-building which the law does not reach, which builders and owners are indifferent to, and which is illustrated on almost every street and road.

This carelessness is due to a failure to realise the real importance of the art of building. It is a serious thing to build a house. It means the expenditure of a sum of money, often large in amount, in a permanent work that is so seldom altered as to be practically unchangeable. The house builder, therefore, assumes, whether he fully realises or not, a responsibility to the public that may view his structure, willingly or unwillingly, as well as to himself. And this responsibility extends not only to his own occupancy or ownership of the building, but so long as it may last. One may not build for all time, but one at least builds for some time.

No method has yet been devised for punishing those who build ugly buildings, and probably there never will be. The Philistine who builds an ugly house can, perhaps, content himself with it or find someone else who will be equally happy in an indifference to appearances. And yet the whole tendency of American practice in house-building is toward betterment in appearances. Our houses are not better built than they were twenty-five or fifty years ago, and yet the average house is better to look upon. This betterment, however, still leaves so much to be desired that it may be profitable to consider some of the reasons why some houses are good and others bad.

There is, unquestionably, an advance and an improvement in design compared with the results achieved twenty years since. People are waking up, more and more, to the value of houses that not only are good, but which look to be good. Good-looking houses are quite as much in demand as good-looking carriages or handsome horses, and the market for them is much greater than for fine paintings or other high-grade works of art. Here is an economic fact that apart from any question of art, is helping in the bettering of the appearance of our cities and towns; and this, possibly more than the spread of a real architectural taste, will hasten and develop good building and good design.

The speculative builder, the man who builds houses to sell, is the most powerful as well as the most dangerous factor in the development of house architecture. He is the most powerful because the larger number of houses are built to sell; the individual builder, owner and occupier is as yet in the majority. Miles and miles of streets in New York are lined by the creations of the speculative builder; and the most gratifying evidence of his progress in the last ten or twenty years is shown by the continued betterment in the appearance of the buildings he erects.

It is quite the same in country and suburban districts, many lesser towns and new settlements without end having been opened up and developed by the real estate agent who looks upon houses as articles of merchandise rather than as things of beauty. He has been forced to recognise the fact that beauty in a house will help him to sell his wares; but it is obvious a vast difference exists between him and the man who seeks to make his home beautiful for the love of the beautiful. And it is because of this that the speculative builder is a dangerous factor in artistic development. True beauty, true art in building, can only come with a real and personal appreciation of what this quality is. It is hard to believe that real progress will be accomplished when those chiefly responsible for what progress may be made do not thoroughly realise their responsibilities.

The case of the man who builds his own house and intends to live in it is very different. He, at least, may be expected to exercise care in the design of his dwelling, and see that it is fit and appropriate to its use and its surroundings. His house should, in the first place, be individual. Not necessarily representing the foibles and hobbies of its builder, but showing that he thought enough of his dwelling to make it a good house to live in and a good house to look at. And it is well to remember that more people will look at his house than will live in it. He cannot ignore his responsibility to the public at large any more than he would neglect the convenience of his family, who must content themselves with what he provides them with.

And so the careful man will see that his design is a pleasing one to begin with. If he has no taste of his own, he should consult those who have; and the trained worker in building—the architect—is the one best fitted to advise and direct the whole undertaking. He will make his design as beautiful as he can, and if he seeks the proper advice he will speedily discover that great beauty does not mean, necessarily, great cost. A simple little house, well designed, carefully treated, detailed in a refined manner, built without ostentation and designed for a specific end, will give greater joy to its creator, to its owner, to the people who will live in it, and to those who can't help seeing it, than the most lavish display. No part of a house is too small or too unimportant to receive attention, and every part, if carefully treated, will amply repay the care lavished upon it.

CAVENHAM HALL: ENTRANCE FRONT.

It is most important to remember, however, that the mere bringing together of good things in a design will not, of itself, produce a good result. Every part must bear a relationship to every other part. The windows, the doors, the cornices, the porch, the chimneys, must not only each be good in itself, but they must form part of a harmonious design, united and complete. The most beautiful window will appear out of place if it adjoins a doorway that is not harmonious with it. A misshapen chimney may spoil a design otherwise of the utmost merit.

It is care in such matters that makes one house better than another, and which is the distinguishing mark between houses that are good and those that are bad. A house is an expression of an idea. If it is well expressed, it will be good; if it is badly expressed, it will be a failure. Behind the idea is the man who is responsible for it. If he fails to realise his responsibility, if he is careless and indifferent, if, above all, he does not know, and, more than that, does not wish to know, the result is certain to have every quality of badness and failure.

Houses are good in proportion to the care taken in their design. Nothing pays better in the long run. Nothing of any value has yet been produced in the world that has not entailed thought to bring it to realisation. A house is no exception to this rule. A house cannot be successful from an artistic standpoint that is not the result of much thought, carefully pondered, and expressed in the most intelligible fashion.

The question of fitness covers certain other qualities in building that are indispensable to success. Just as an evening coat is unsuited to a morning devoted to business, so every design, every combination, is not adaptable to every condition.

A house must be fitted to its use, its surroundings, its cost. It is a mistake to model a parish church after a great cathedral, or a modest dwelling after a sumptuous palace. These are extreme illustrations, but they point the lesson. It is difficult, at times, to admit the influence of the adjoining dwelling—and if it is bad, that should, of course, never be done—but it is not always possible to get away from it.

A very grave error is often made in borrowing some one feature from another house because it has proved attractive under the conditions that may have brought it into use. Yet its very attractiveness may have been occasioned by the combination and the circumstances that are wanting in its new application. Good features need not be avoided because they have already had use; but their proper use is not to transplant them bodily as one would a plant, but to recombine them, develop them, adapt them; not put them into a design, but make them part of it. In a word, study their fitness.

The most successful buildings, on the whole, ever built in this country were those erected in the last century and the early part of the present, and which are called "Old Colonial." They were carefully designed and magnificently built. With all our more abundant resources and greater knowledge, our builders of to-day do not equal the construction of that earlier period. They were carefully built, because the erection of a house was a serious undertaking, more serious than it is to-day, when expensive city buildings are pulled down to make way for more modern edifices. And not only were they carefully built, but they were thoroughly fit for their purposes. The great house was a splendid mansion; the simple house was an unpretentious affair, with slight ornament, and simple treatment that even to-day wins our admiration amid more gorgeous neighbours.

The chief lesson to be derived from these buildings by the modern builder is not that that particular style is the one to be followed, but that its methods contain all the secrets of why some houses are good. Unfortunately, the modern method is to borrow styles rather than methods; to copy forms rather than ideas. But we cannot hope for a genuine architecture, even in a problem so simple as an ordinary house, until the thought that underlies the form has been discovered and understood. The first step in building a successful house is to think. Too often the house is built, and then thought taken in making it inhabitable and good to look at.—(From the "Scientific American.")

BRICKWORK IN PARIS.

By WILLIAM T. PARTRIDGE.

THE predominant characteristic of nearly all the brickbuilding in Paris is picturesqueness. Whether that quality be altogether a desirable element in city building is at least open to question. Brick, of course, lends itself readily to the picturesque; and the small size of the buildings in which brick is employed in this city offers further temptation for the use, perhaps the exaggeration, of that quality. It is certainly much easier to make a picturesque design when the problem is a small one, or the site irregular.

To this picturesqueness of outline colour is the natural accompaniment; and the domestic structures in Paris being, as we have said, small, are freed from the strict regulations governing larger buildings and open a limitless field for the use of brick in obtaining the desired colour.

In the smaller domestic work, then, and wherever individuality and colour are sought for, brick is much employed, although stone is a cheaper material and is more easily obtained. Therefore, in looking for examples of brickwork we naturally turn to those residence centres where small private houses mark individual ownership.

Many of the buildings might fittingly be called architectural misfortunes. They are almost grotesque. In many cases, to be sure, there occur happy combinations of colour, but they are usually wasted upon buildings unspeakably poor in architectural form. Examples of the reverse instance—good outline and atrocious colour—are no less common. In most of this smaller work, indeed, the so-called "emancipation" of the French architect from the influences of the past is a matter for sincere regret. Many an attempt to reproduce a Louis XII. motive is marred by moulding, or rather expanding, its graceful detail into conformity with the school traditions. The consequent changes in scale are ruinous.

It is in the new quarter of Paris that the most interesting examples of brickwork are to be found. Brick is employed there occasionally in apartment houses as well as in private dwellings; but the larger structures are so hampered by building laws that there is little or no attempt at actual recognition of that material. Several schools and colleges, by the way, are built entirely of brick; and some attempts at a commercial or factory type, employing a com-

HOUSE IN YORKE ROAD, REIGATE. DRAWN BY THE ARCHITECT, A. N. PRENTICE.

bination of brick and iron, have been made from time to time.

The quarter of Hausmannised Paris that we mean to designate lies around the Place des États-Unis, the Parc Nouveau, and the little street of Eugène Flachat.

On the south side of the Place des États-Unis stands the house of Julian Story, the American artist. It is of a light-coloured brick, originally yellow, with red-brick quoins. The entrance, bay, an addition, and windows above are of stone, following an Italian rather than a French Renaissance precedent. A further touch of Italy is given by the wide projecting eaves. The studio is recessed and breaks the roof-line pleasantly. But the large window lighting the studio proper is bare and meagre in comparison with the charming stone motive directly above it. The brick decoration contributes an air of gaiety that is not displeasing; but greater refinement and dignity might have been obtained by using, below the attic at least, brick of only one colour with no attempt to enliven the surface by the weak cornice decoration of imitation quoins. Another innovation that is, on the whole, rather unfortunate is the addition of the entrance, which, although it makes an interesting composition, mars the mass of the main building.

Another dwelling which by its overhanging roof and arcaded upper storey is stamped with Italian influence is found in the street of Eugène Flachat. It is a logical expression of the plan, and satisfactory in spite of what may seem to be a lack of symmetry. A few simple broad lines of stone frame the lower three storeys, while the arcade and overhanging roof lend dignity to an irregular though frank fenestration. Coloured mosaic decoration is used in the cornice and under the arch of the principal window. A unique iron balcony binds the double window, and all of the stone carving is refined in detail.

Further along the same street is another and simpler Italian motive—a house of glazed brick, with no attempt at architectural treatment except in the strong basement and crowning eaves. Much of the decoration in brickwork is coarse, and much is meagre, as, for example, where the voussoirs of the arches are ornamented.

On each side of this building is a smaller house, one Gothic, the other in a late Renaissance style. The former is built entirely of brick except the base and entrances. Considerable effect is obtained by brick corbels. Coloured tile-work appears in what serves as a frieze, and a diaper pattern of dark brick covers the body of the building.

The more formal specimens surrounding those we have selected follow two conventional styles—the French Gothic and the style of Henry IV. or Louis XIII. The Gothic examples in brick are for the most part modelled after the Louis XII. wing at Blois.

A small, though none the less interesting mass, is near the Place des États-Unis. In contrast to the freedom of its large rival, its sky-line is marred on account of a bald utilitarian background—the walls of a neighbouring apartment house. The reinforcement of the soft stone party-walls of the latter by brick ties is interesting.

The florid house on the street of Leo Délibes, with its great studio window, suffers in comparison with the charming little composition near the Sorbonne, which has an individuality as distinct as the work of Burges or Wilson Eyre.

There are several attempts at the use of brick and iron in domestic work in the Style Nouveau, but the result is one to avoid. In the suburban streets are many especially attractive brick compositions. Here the background of foliage gives contrast and makes welcome that picturesqueness of which one is timid in the city.

Thus far, it will be observed, the notes of this architectural pilgrimage have omitted accrediting work to the several designers. But in the domestic architecture of Paris there is an utter lack of that individuality of conception that stamps the London dwellings, for example.

An architect visiting in Paris finds himself compelled to refer to the architectural periodicals for the identification of the smaller buildings. In England, on the other hand, the first glance at a building enables him to name the designer, Shaw, Belcher or Ernest George, as the case may be. Does the École training destroy individuality?—(From "The Brickbuilder," Boston, Mass, U.S.A.)

HOUSE AT PINNER FOR MR. J. H. SHANKLAND. DRAWN BY THE ARCHITECT, A. N. PRENTICE.

HOLBORN'S PUBLIC BATHS.

THE foundation stone of a new swimming bath in Broad Street, an extension of the Public Baths and Wash-houses in Endell Street, Holborn, W.C., was laid last week. Messrs. John & S. Flint Clarkson, of Ormond Chambers, Great Ormond Street, are the architects, their design having been accepted from several others submitted; Messrs. F. Gough & Co., of Hendon, are the contractors; and it is anticipated that the total cost of the land and baths will amount to the sum of £25,000. The extension, which will have a frontage in Broad Street of 55ft., and a depth from north to south of 130ft., will provide a swimming bath 90ft. in length, with closed dressing-boxes entered from the platforms. The bath will be paved with mosaic, the walls faced with glazed bricks, and domed ceilings of fibrous plaster will be formed above the lantern lights; a gallery will run round all four sides of the bath hall. There will also be subways all round the bath hall, entered through a vestibule, &c., from Broad Street. The height of the bath hall will be about 40ft. from the bottom of the bath to the domes. The elevation towards Broad Street will be four storeys high, of Portland stone, red Bracknell bricks being used for the upper floors. The elevation will resemble the existing front in Endell Street, the resemblance being intentionally made so strong that it will be clear that the two frontages are parts of one building. There will also be provided rooms for clubs, and a general supplementing of the existing accommodation. All the floors will be constructed of fire-resisting material. The water in the swimming bath will be heated by steam. Arrangements will also be made for the steam-heating of the atmosphere, so as to counteract condensation, and to enable the bath to be kept in use in chilly weather.

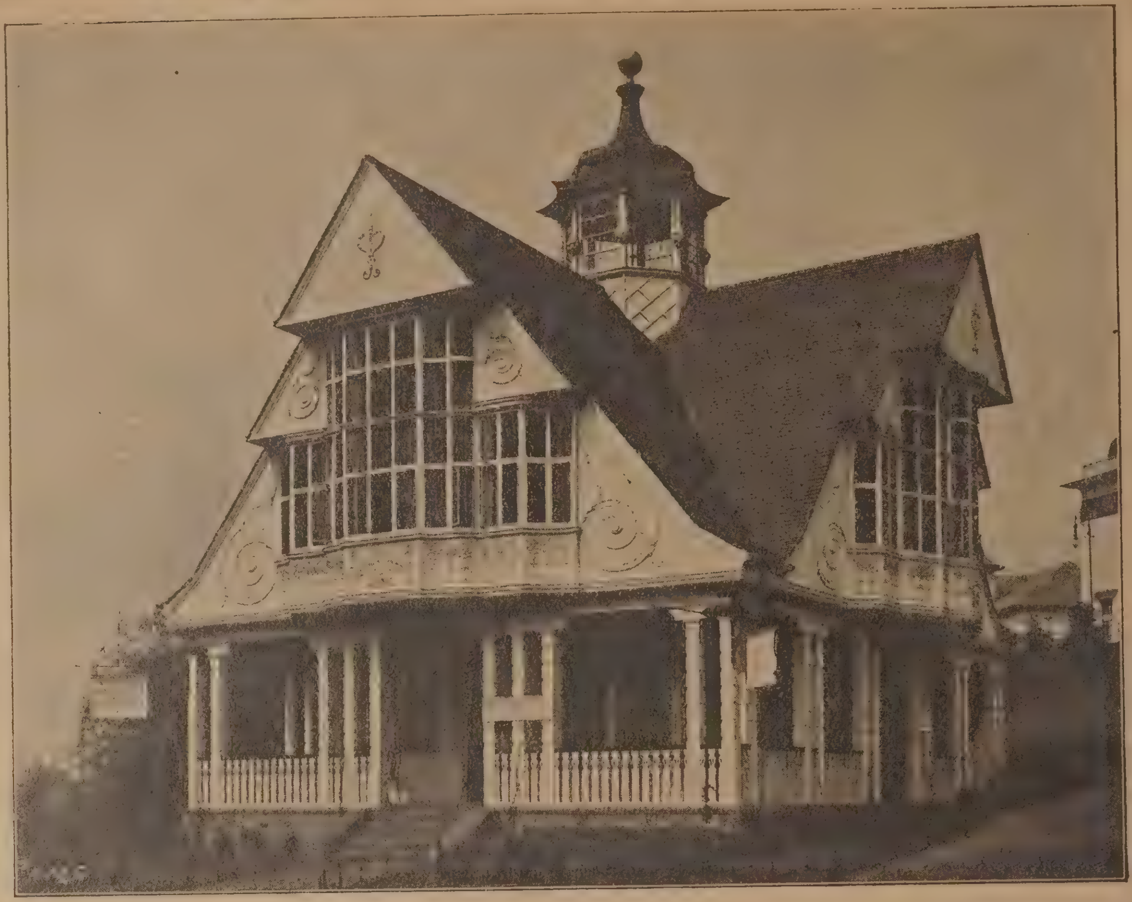
Mr. James Jemson, an architect carrying on a large business in the Fylde district, and surveyor to Preesall Urban Council, died recently from an overdose of a sleeping draught.

Engineering Notes.

Electrical Development at Tyneside.—The power station of a new electric power supply company has been opened at Wallsend-on-Tyne. The scheme has been promoted by the Newcastle Electric Supply Company and the Walker and Wallsend Union Gas Company.

A New Pier at Cromer was opened recently. The deck is 500ft. long and 40ft. broad, with bays extending to 60ft. The head expands to a width of 112ft., and here are shelters and a bandstand. The engineers were Messrs. Douglass, and the contractors Messrs. A. Thorne, B. Cooke & Co., and A. Fasey & Son.

The Gigantic Reservoirs at Staines will shortly be completed. Parliament has authorised the Staines Reservoirs' Joint Committee to take 100,000,000 gallons a day from just above Bell Weir lock, making the total daily intake of the water companies upwards of 300,000,000 gallons, and storage is now being provided at Staines for a total of 3,300 million gallons. The reservoir—for it is one for all practical purposes, although bisected for the sake of convenience—is reputed to be the largest artificial construction of the kind in the world. Its extent may be judged from the fact that it is a stroll of four miles and a quarter round its bank, and that a football and cricket ground, presently to be submerged, is a mere patch upon its surface. The water from the Thames, siphoned under several of its tributaries, is to be pumped up into the reservoir, and it will then flow in an open conduit some eight miles in length to Hampton, where it will reach the filter beds of the New River, Grand Junction, and West Middlesex companies, the joint promoters of the scheme. In event of emergency the water can be sent direct to Hampton without being stored at Staines, but the merit of the undertaking is that it will enable a large reserve to be kept at the latter place. The reservoir, in one way and another, will cost upwards of £1,000,000.



KIOSK FOR MESSRS. VAN HOUTEN AND SONS, GLASGOW INTERNATIONAL EXHIBITION, 1901. A. N. PRENTICE, ARCHITECT.

RESTORATION OF ABBEYDORE CHURCH.

ABBEYDORE CHURCH, in Herefordshire, is badly in need of repair, and funds are now being collected for the work, which will be done under the guidance of Mr. Roland W. Paul. The Abbey of Dore owes its existence to Robert, Lord of Ewiss Harold, who founded it for Cistercian monks in 1147. Its situation in the beautiful Golden Valley—secluded, like other Cistercian houses, well within the chain of border castles that stretched from Grosmont and Longtown to Clifford and the Wye, and within a couple of miles of the castle of its founder—doubtless saved it from the inroads of turbulent bands, which made its neighbour, Llanthony, in the Black Mountains, well-nigh untenable. From its foundation until the latter years of the thirteenth century there seems to have been but little to check its growth. A consecration took place at the time of Bishop Cantilupe of Hereford (1275-82), and this probably marks the completion of the church. The excavations on the site of the nave that have been carried on since 1893 by Mr. Paul have strengthened the theory that no structural alteration beyond, perhaps, revaulting took place in the building between that date and the Dissolution.

The Plan.

The church of Dore followed the usual Cistercian plan. It had a long nave with narrow aisles, aisleless transepts with two eastern chapels, and an aisleless presbytery projecting beyond them. The cloister court was on the south side, and the buildings surrounding it included, on the east, a vestry, chapter-house and cellarage, with dormitory over; on the north, the frater, warming-house, kitchen, &c.; and on the west, the range of cellarers' buildings, and rooms for the conversi or lay brethren, which was divided from the cloister by a "lane" or court, as at Byland, in Yorkshire. A short time only could have elapsed between the completion of the church as originally planned and the time when it was no doubt found necessary to enlarge the presbytery. This was done by removing the eastern walls of the two inner transept chapels, piercing the presbytery with arcades, and carrying an aisle or ambulatory round it. On the east, a range of five chapels was erected, and there were two other chapels in the south aisle. This eastern extension is one of the most beautiful features of the interior, and was highly decorated with colour, much of which still remains, partially hidden by whitewash. During the thirteenth century it is evident from discoveries made that the south aisle of the nave was partially or wholly rebuilt, and both aisles and nave were revaulted.

Arrangement of the Nave.

Digging has determined the length of the nave and its arrangement. It was 137ft. long, of nine bays, with narrow aisles. At the second pair of columns west of the "crossing" was the pulpitum or great screen wall, against which the monks' stalls were returned and which formed the termination westward of the monastic ritual choir. Against its west side were two altars, both of which were discovered in a mutilated condition. Further westward, in the fifth bay of the nave, was a second screen, having a central altar against its west side, flanked by doorways. This formed the altar of the conversi, and their choir stalls stood on either side between this altar and the west end of the nave. They had access to this part of the church from their buildings on the west side of the cloister across the "lane," and through the doorway in the north aisle. It is uncertain whether or not there was a west doorway. The return wall was discovered at the north-west angle, but the rest of it appears to have been destroyed. The stone screens which were placed between the columns in Cistercian churches, dividing the nave from its aisles, were discovered remaining 2ft. or 3ft. in height, in two bays on the north side. The arcades had pointed arches, carried on large circular columns with square bases. The whole was late Transitional Norman. There was no triforium, but over the arcade, and divided from it by a string course, was a clearstory, with a single lancet in each bay. From discoveries made it was clear that the whole of the portion of the nave near the nave altar and the pulpitum was richly decorated, and the space between the two screen walls was probably largely taken up by monuments and tombs. Of the many tombs that the church must have contained only three effigies now remain.

The Chapter-House.

Of the monastic buildings which stood on the north side of the church the most remarkable was the chapter-house. It was a twelve-sided building with a central shaft, and was an enlargement eastward, in the thirteenth century, of the earlier chapter-house, which became in the transformation its vestibule. Doubtless this enlargement was a part of the scheme, which included the enlargement of the presbytery, and it is noteworthy that the Cistercian monastery at Margam, near Swansea, founded in the same year as Dore by Robert Duke of Gloucester, has a chapter-house of similar form but of earlier date. The presbytery of Margam was, like Dore, enlarged, and it is quite possible that, close as the communication was between the Cistercian houses, Dore copied its chapter-house from Margam, and Margam in its turn was induced to rival Dore in the glories of its presbytery. In 1534 the monastery was dissolved, and the dissolution left Dore much as other monasteries were left. Altars and images were broken down, the roof was removed, the paving was torn up, and the glass destroyed, and in course of years the elements completed what the desecrator had begun. It passed into the hands of the Scudamore family, and no doubt it became a quarry for the neighbourhood. It remained in its ruined state for nearly a century, when John, Viscount Scudamore, decided, amongst his other munificent acts, to restore a portion of the church for divine service. It was reopened on Palm Sunday, March 22nd, 1634, with much ceremony.

Lord Scudamore's Restoration.

The restoration by Lord Scudamore forms a very interesting period in the history of the fabric. He found the great church a ruin. The church was large; the village, possibly large during the flourishing days of the Abbey, had become reduced in size after its dissolution. He decided therefore to restore a part only of the church, and the eastern arm naturally was that which lent itself the most to the requirements. Its vaulting was gone, and the transepts and presbytery were re-rooofed with a flat plaster ceiling, divided by beams carried on brackets springing from the old vaulting shafts. The altar, found used as a salting stone, was replaced.

The fittings included an elaborate Renaissance screen, the east arch of the "crossing," pews, pulpit, and prayer desk under the "crossing" west of the screen, a western singing gallery, a south porch, and the railing in of the sacrarium. The eastern triplet over the altar was glazed with coloured glass, excellent for its date, and at the junction of the transept and choir a large tower was erected, crowned with a battlemented parapet. The western arch of the "crossing" and the arches from transepts to nave aisles were built up.

We thus have at the present-day half of a large mediæval monastic church, unique in many of its architectural features, highly interesting it its planning, and standing alone as the only Cistercian presbytery used for divine service at the present day. Scudamore's restoration, if causing some anomalies for the student of to-day, was good of its kind, and, considering the difference in style, the "scale" of the great church has been admirably kept in the fittings which were introduced. He not only preserved for us a most valuable architectural monument, but considerably added to its interest by his treatment of the interior.

NEW WORKHOUSE INFIRMARY, HALIFAX.

A NEW workhouse infirmary was recently opened at Halifax. The new institution, which is to be known as St. Luke's Hospital, is a good half-hour's walk from the workhouse—in another part of the town altogether. It is on a twelve-acre site at Salterhebble, occupying a conspicuous position on the high road from Halifax to Huddersfield. The scheme provides for a hospital to accommodate the maximum number of patients allowed by the authorities in London, namely 750. It is, however, considered that for some time to come wards for 400 patients will be sufficient. For reasons of economy and convenience the administration block has been completed, so that it will only be necessary to add pavilion after pavilion as required. Of the ten pavilions that will ultimately constitute the the hospital proper six have been erected—three for males and three for females—besides two pavilions that will form the maternity department. The approximate cost of the whole scheme will be £130,000; the estimated cost of the portion now taken in hand was £103,000, but so well has the architect—Mr. W. Clement Williams, F.R.I.B.A., of Halifax—succeeded in avoiding that bugbear of building operations, "extras," that the expenditure has been kept well within the latter figure. This item does not include the land, which was bought for about £7,000, or the furnishing, which will involve a further outlay of £4,000.

Though little has been attempted in the way of external decoration, the grouping of the buildings produces a striking effect, with the nurses' home occupying the principal front, flanked by two large central pavilions, and having oblong pavilions branching out in other directions. The nurses' home has accommodation for about eighty beds, with sitting-rooms, lecture-room and other accessories. Immediately behind is the central administration block, and to the right and left are the pavilions for male and female patients. The two circular pavilions are each about 62ft. in diameter, and three storeys high, each of the wards providing for twenty beds. The four oblong pavilions are two storeys in height; each of the wards is over 90ft. long, and has provision for twenty-eight beds. Connected with the pavilions are isolation wards and the needful rooms for nurses. Altogether there are in the hospital proper fourteen large wards and twenty-eight small ones, the latter being for two or single beds. But in addition there is, quite apart from the main buildings, a small maternity hospital, complete in itself, and consisting of two pavilions, which it is intended to use alternately. The operating theatre, the kitchens, and the steam laundry, to name but three of the principal auxiliaries, are admirably fitted up with the latest appliances. A complete electrical plant has been put down, and from this centre the lights, the lifts, the telephones and the hot hearths for the duty rooms of the sick pavilions are worked.

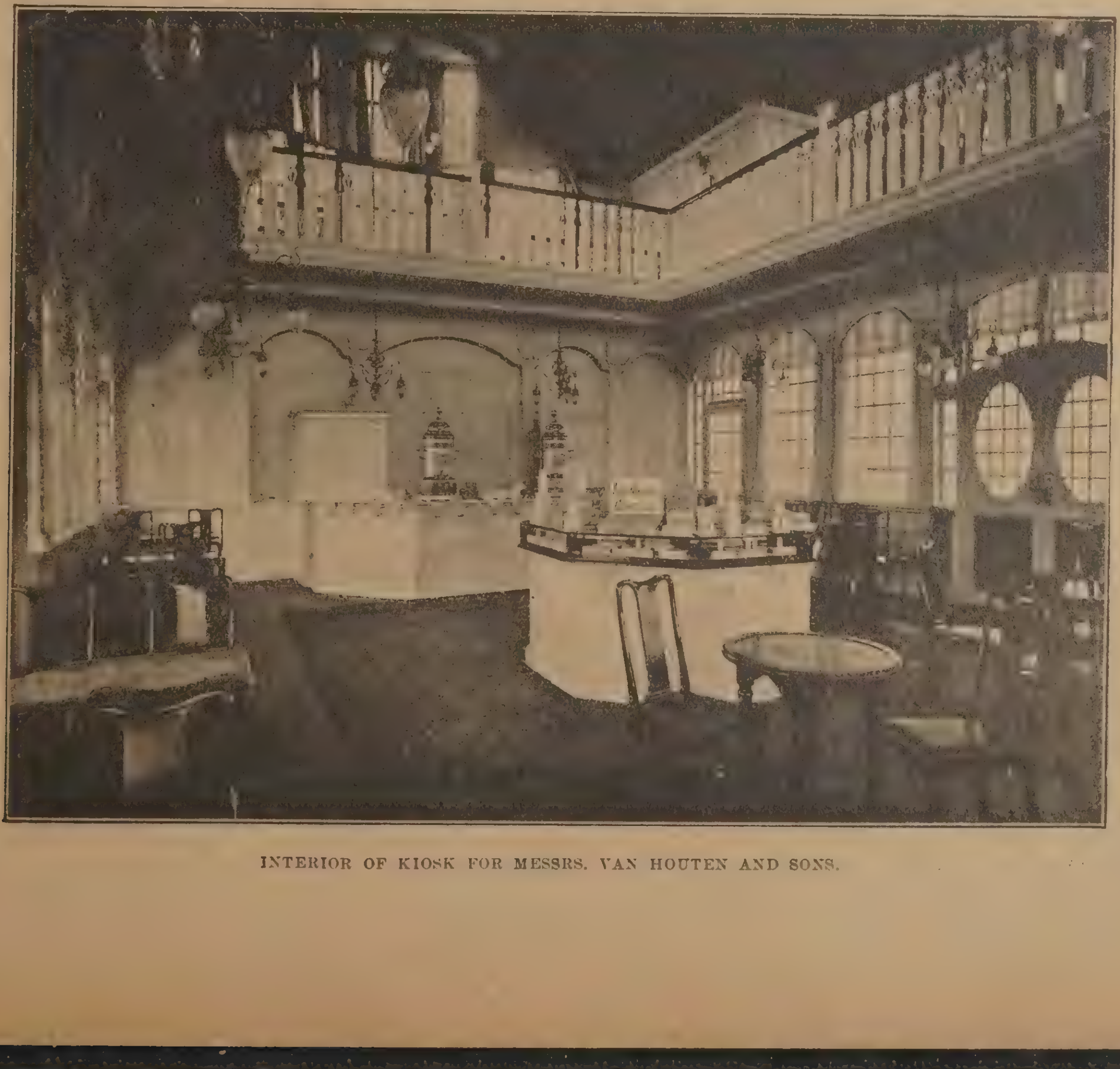
Professor Hermann Grimm, the last surviving male representative of the Grimm family, who was for many years Professor of Art History at the University of Berlin, died recently. Professor Grimm, who was a son of Wilhelm Grimm, was born at Cassel in 1828. After studying law at the Universities of Berlin and Bonn, he settled in the German capital and devoted himself to literature and to the study of art. He was the author of several essays and novels, but his best known work is his life of Michael Angelo, which was published in 1860.

Surveying and Sanitary Notes.

A New Road at Colne a mile long has been opened. The town is built upon the hillside, and the new road has been constructed with considerable skill and ingenuity at a cost of £10,000. It will form part of a new highway to Yorkshire. Previously the only through road was up a precipitous hill, and great inconvenience was felt with heavy traffic. It is expected that it will greatly develop the town and add to its ratable value.

Sale of Building Plots at Herne Bay, Kent.—On Monday in last week a number of freehold building sites on the West End Estate, No. 2, at Herne Bay, Kent, were sold for the New Century Land Co. by Messrs. Rippin & Rake, 33, Cheapside, E.C. Herne Bay is sixty-three miles from London, and reported by the Registrar-General to be the healthiest town in England. Of late years the place has been largely developed, and the value of property has increased by eaps and bounds: land near the station has been sold at the rate of £17 per ft. frontage.

The Drainage of Zermatt.—There is not in Switzerland a centre of exercise which has grown so rapidly in dimension and in popularity as Zermatt. Twenty years ago there were but two large hotels. There are now over twenty. The drainage of what may be called, in the height of the season, the town has become a serious problem to all concerned. From time to time suspicion has been aroused as to the insanitary condition of the village. The hotel proprietors have made up their minds to cope with what was becoming an increasing difficulty. They have formed themselves into a syndicate to provide the capital necessary for the introduction of drains on the most approved method. Water from the Trift-thal is kept perpetually running through the system, and from such a height the flush will be quite effective. The work will be completed in the early summer. Two other improvements have been made. A huge reservoir has been constructed up the Trift, which supplies the hotels, fountains, fire and irrigation pipes; and the vexatious cobstone in the central highway has given place to a smooth pavement.



INTERIOR OF KIOSK FOR MESSRS. VAN HOUTEN AND SONS.

CAVENHAM HALL, SUFFOLK: VIEW OF DINING-ROOM INGLENOOK.

Masters and Men.

The Leek Bricklayers are still on strike.

A Strike of Dudley Carpenters to the number of about 100 has occurred against a reduction of a halfpenny per hour in their wages.

The Strike of Norwich bricklayers, which has lasted nearly thirteen months, came to an end last week, the masters conceding an advance of a ½d. an hour from January next.

The Strike at the Penrhyn Slate Quarries seems to be practically over, as the quarries have reopened, and there is a large number of men at work, although it is in dispute exactly how many.

A Brickworkers' Dispute has arisen between the workmen employed by the London Brick Co. and their employers, a strike of 520 men having occurred for a 1d. increase per thousand output. This would mean an additional 2s. or 3s. on each man's weekly wage.

The Strike of Norwich Bricklayers, which has lasted for over twelve months, has at last been brought to a close on what is really a compromise, but which concedes the men some real and tangible advantages. The question which has given so much trouble of late, that of the "demarcation of work," has been "unreservedly left to the employers, who undertake not to infringe upon work usually done by bricklayers."

Wages in Gloucester.—The Gloucester Master-Builders' Association have had a conference with delegates of the bricklayers and carpenters with reference to the proposed alteration of wages. The men have applied for ½d. advance, whereas the masters had given notice to reduce their wages from 8d. per hour to 7½d. It was decided to let the carpenters and joiners' wages remain as at present. The bricklayers have placed the matter in the hands of their society.

Teeside Joiners and Co-operative Workshops.—As a result of a conference of the strikes committees of the Teeside and Hartlepool District operative joiners, the principle of establishing joiners' workshops on a co-operative basis has been approved, and the united trades committee has been instructed to devise a scheme on the lines of the Blackpool undertaking, and to apply to the Executive Council of the Amalgamated Society of Carpenters and Joiners for funds to finance the same. It is stated that the committees at Stockton, the Hartlepools, and Middlesbrough have already received offers of considerable quantities of work from builders and others.

THE TESTING OF BUILDING STONES.

SOME time ago M. Gautier presented to the Commission of the Methods for testing Building Materials a very interesting study relating to the system for testing quarry building stones. The responsibility which the architect and builder incur at the present day necessitate very great care as regards the stones employed for building. Formerly, as M. Gautier remarks, quarry stones were not subjected to any test. They were utilised in the vicinity of the quarries, and the quality was appreciated from the examination of previously constructed buildings. Now, however, circumstances have changed—stones are transported far from the place of extraction, new quarries are constantly being opened, and there is no time to practically estimate the qualities of the material extracted. Hence it has become necessary to subject stones to brief tests which demonstrate whether they possess the properties required for the particular purpose in view.

Until within late years stones were only tested from the point of view of their specific gravity and resistance to crushing, but it was found that other tests were needed, variable with the particular employment of the stone. Sometimes stone is utilised for balconies or lintels, where it is subjected to bending strains, so that it must be tested from the point of view of rupture by flexion. Some stones are employed for flagging, in which case one must ascertain how they wear in such circumstances; it may also be useful to estimate the difficulty of hewing. Thus we are led to hardness tests.

It is very difficult, strictly speaking, to define the word hardness, though there are several methods to estimate peculiar kinds of hardness, which are—resistance to wear by friction, resistance to splintering under impact, and resistance to drilling.

Recently-extracted stones, saturated with water, are, as a rule, less hard and easier to work than those which have lost their quarry water. Stones always contain foreign substances, which must be studied in many cases. Thus, stones which contain a large proportion of clay should not be subjected to frequent alternations from dryness to moisture, for they would then rapidly fall to pieces. Those containing magnesia are very sensitive to the action of sulphur existing in the form of sulphurous acid or hydrosulphuric in the atmosphere and soil. Therefore they should be chemically analysed.

It is well to be acquainted with the power and more or less great rapidity of absorption possessed by a stone, as this power has an influence on resistance; in this case tests of porosity must be made.

Certain stones break under the action of frost, which acts upon them in very different ways; it makes them splinter in all directions, divides them into scales, according to the beds, or, again, hollows them in the soft parts, or progressively removes the surface in the form of scales. It is then very useful to ascertain in advance the effects of frost on stone by subjecting it to frost tests.

To study the action of frost on stones artificial freezing methods are employed, but only indications can be thus obtained, for it is very difficult to realise the same conditions as those of nature. Until recent times the Brard process was employed, as defined by M. Héricart de Thury. Now apparatus are employed by aid of which the samples can be frozen at - 15° to - 20° C.; it is an artificial winter in a peculiar scientific acceptation.

Frost, however, is not the only stone destroyer, for there are many other factors which contribute to its destruction—the sun, carbonic acid of the air, moisture of atmosphere, rain, temperature, &c. Unfortunately there is no test for determining the resisting power of stone to these various agents. Experience alone can instruct.

DUTCH LIBRARY TO HOUSE IN GLASGOW. BY A. N. PRENTICE.

THE TRANSFORMATION OF BRIGGATE, LEEDS.

WHEN Leeds became a city eight years ago, a number of enterprising inhabitants set themselves the task of making it look like one. Five years ago the east of Briggate was lined by a row of variegated shops and shanties intersected by numerous dark passages that led to filthy backyards and noisome slaughter-houses. These examples of bygone local architecture have been swept away to make room for new streets and arcades, for a music-hall, and for about 250 lofty business establishments. The shopping area of Leeds has been increased by several acres and the ratable value of Briggate and its immediate vicinity has grown during the past five or six years by more than 20 per cent.

For this unique transformation the Leeds Estates Company, Ltd., the City of Leeds Central Estates Company, Ltd., the New Briggate Arcade Company, Ltd., the Buck Hotel Syndicate, and Messrs. Moss & Thornton, who built the Empire Palace, are mainly responsible.

In 1895 the Leeds Estates Company began their great scheme of evolution. Rights of way and light constituting too formidable an obstacle for dealing effectively with the property in a piecemeal fashion, they did not hesitate to try a bolder plan. Their first public transaction took place towards the end of April, 1896, when they entered into an agreement to pay £60,500 for Messrs. Willett's estate in Wood Street, and by the following August they had secured possession of this important site. Of the other eighteen plots which they bought may be mentioned Messrs. Smith's property, for which they paid £30,000; Mr. W. Kettlewell's estate, £20,000; the Shambles, £20,000; an estate belonging to Harrison's trustees, £46,500; land owned by Beuley's trustees, £34,400; and the old Grammar School site and adjoining property, including the Greyhound Inn, £37,000; plus nearly £4,000 costs of going to Parliament. The purchase price of these seven properties adds up to more than a quarter of a million sterling. Altogether the company acquired nearly 4 acres of land, on which stood about 200 old buildings—cottages, warehouses, stables, slaughter-houses, and nine public-houses. The company are providing a big and elaborately-decorated café. The County Arcade, now being completed, and extending from Briggate to Vicar Lane, is 275ft. long by 18ft. wide. It contains a number of granite pillars, the floor is covered with mosaic work, and all the shops are being fitted with mahogany fronts. Then there are two new thoroughfares running parallel to each other lower down Briggate, bearing the names of King Edward Street and Queen Victoria Street. Both are 36ft. wide and bounded by shops. Altogether the company are providing 170 tenancies, the majority of the buildings being shops. The last contracts are now in hand, and in fifteen months the transformation of this part of the city will be complete.

The City of Leeds Central Estates Company, Ltd., are building on a site of 5,015 sq. yds., lying between Kirkgate and Duncan Street. The properties annexed by them include the Bull and Mouth estate, Newsome's Yard, Old Infirmary Yard, and a small strip of land on Central Road. They have demolished 61 cottages. Some of these hovels consisted of but one room 6ft. or 7ft. square. A new street 42ft. wide, provisionally named New Central Road, crosses the site from Kirkgate to Central Road, and in due course will be handed over to the Corporation to pave and flag. The old posting-house, the Bull and Mouth Hotel, where in "the good old days" coaches used to start for London, is being superseded by a structure of brick and terra-cotta, with sleeping accommodation for 150 visitors. Among other features of the new establishment will be a billiard-room with eight tables, a buffet and luncheon bar, a big dining-room and twenty-nine stock-rooms. Adjoining, with a 320ft. window frontage to Briggate, a large six-floored general store is in course of erection. The new street from Kirkgate will be lined by twenty-two shops available for general purposes.

The New Briggate Arcade Company have completed the greater part of their task in the upper part of Briggate. The site of the Grand Arcades, covering an area of 3,535 sq. yds., was formerly occupied by an old finishing mill, the mill-dam concealed from Briggate by a tall hoarding and three or four shops facing into North Street. The company commenced operations in May, 1896, and the majority of the fifty-six shops in the two arcades were completed and tenanted by the end of 1897. What is likely to prove a profitable investment for the company is the development of the site abutting on Cross Belgrave Street and facing down New Briggate. Upon this land stood a building once a family residence 200 or 300 years ago. It ceased to be a dwelling-house about half a century ago, and up to recently was divided into four business establishments. Two or three small shops also occupied the site. These premises have now disappeared, and in their place has sprung up a row of half-timbered shops. Sixteen front to New Briggate, and four to Cross Belgrave Street.

ENTRANCE TO STABLES OF CAVENHAM HALL, SUFFOLK. DRAWN BY THE ARCHITECT, A. N. PRENTICE.

New Baths and Washhouses for Haggerston are to be erected on the Mansfield Street site by the Shoreditch Borough Council, and Mr. A. W. S. Cross is now preparing the plans. Provision is to be made for one swimming bath 100ft. by 35ft.; about twenty first-class and fifty second-class men's slipper baths; about five first-class and twenty-five second-class women's slipper baths; and about seventy washers.

BRICKMAKING IN ITALY.

IN THE BUILDERS' JOURNAL for September 19th, 1900, some particulars were given of the brickmaking industry in Russia, and in the issue for May 8th of brickmaking in Hungary. Below are some details of the industry in Italy.

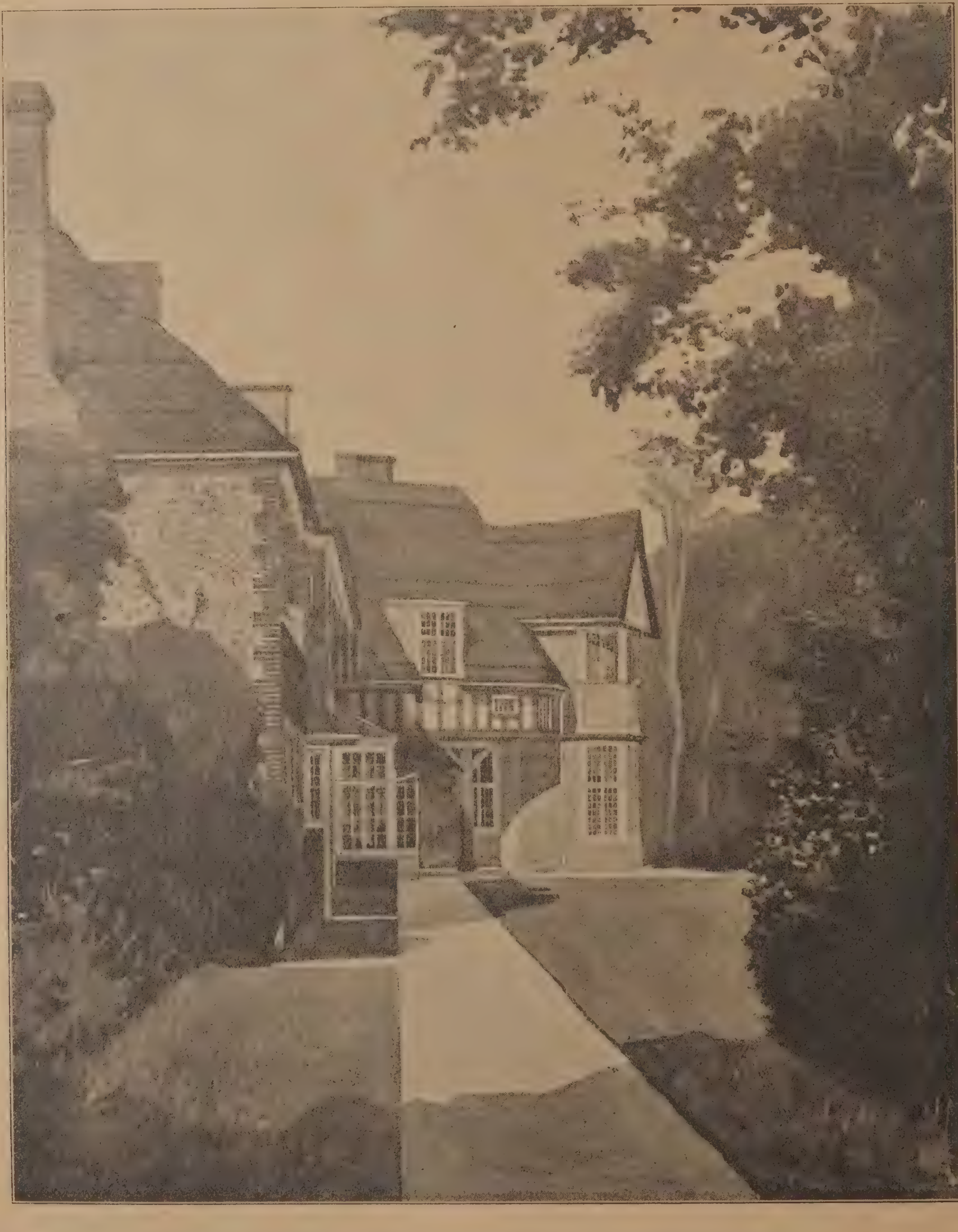
The latest statistics available on the production of building material in Italy are there for the year 1890, according to which those existed in that year 5,635 clay ovens, which produced 3,606,498 tons of material, valued at 39,000,000 lire, or about £1,500,000. The number of workmen employed in these industries was 49,219. The above value represents the output of the different works in bricks, tiles, &c.

The growth of the clayworking industry has been steady and considerable. In 1899 the exports of bricks and tiles from Italy amounted in value to about £160,000. The best customers were Austria-Hungary, Switzerland, Germany, Tunis, Asia Minor, Tripolis, Egypt, Turkey-in-Europe, British India, Algeria and Brazil.

Up to the present time the great bulk of machinery used in the Italian brick industry has been imported from Germany, and, to a small extent, from Belgium, France and Great Britain. Unfortunately, detailed figures on the importation of clayworking machinery are not available, as they are included in the official statistical returns of the kingdom in the item of "general machinery," not especially enumerated. The imports of all kinds of machinery into Italy are largely and steadily increasing. In 1899 the imports of machinery amounted in value to £1,076,500, but increased to £2,253,600 in 1899. These figures speak for themselves. That the imports of machinery continue to increase is shown by the fact that during the first eight months of 1900 the value of machinery imported into Italy was 62,000,000 lire, or about £2,480,000. Not 5 per cent. of these imports were of United States origin, which must be due to lack of enterprise on the part of American manufacturers, as the reputation of American machinery in Europe and the great fear of American competition in those European markets which have been exploited by Americans are both well known.

Most prominent amongst the Italian brick and tile making establishments are firms like the stock company known as "Societa Veneta Per Imprese e Construzioni Pubbliche," of Pasiano, in the province of Udine. This establishment employs over 500 hands, and has more than twenty modern machines and presses. The company known as "Societa Ceramica Ferrari," of Cremona, employs seventy-five hands, while the company known as "Societa Anonina Fornaci Alle Sieci," of Pontassieve, employs 120 hands. An important establishment, also, is that owned by Giovani Ellena, of Bellaso, in the province of Genoa, where about 300 hands are employed. Other leading clayworking establishments are: Astengo Macchioli & Co., of Vado Ligure, where about seventy-five hands are employed; the firm of Bonazzi & Stanisci, of St. Stefano di Magra, in the province of Genoa, employs about 100 hands; Teodosio Bottacchi, of Novara, employs eighty hands; while Rossari Bottacchi, of the same place, employs forty hands. The firm of Corosio & Podesea, of Sampierdarena, near Genoa, employs about forty hands. Ponzone Longari, of Casalmaggiore, in the province of Cremona, employs about 100 hands.

There is little doubt that the output of all these works could not only be increased, but also the product improved, if modern machinery were used. The majority of the factories are of an unpretentious sort, in order not to attract the attention of the tax collector and the rivalry of the larger concerns. It may be added that the manufacture of mosaic is chiefly carried on in the district of Florence. Another very important industry, also, is that of the Italian pottery and porcelain.



THE RETREAT, LAKENHEATH, SUFFOLK: GARDEN FRONT. A. N. PRENTICE, ARCHITECT.

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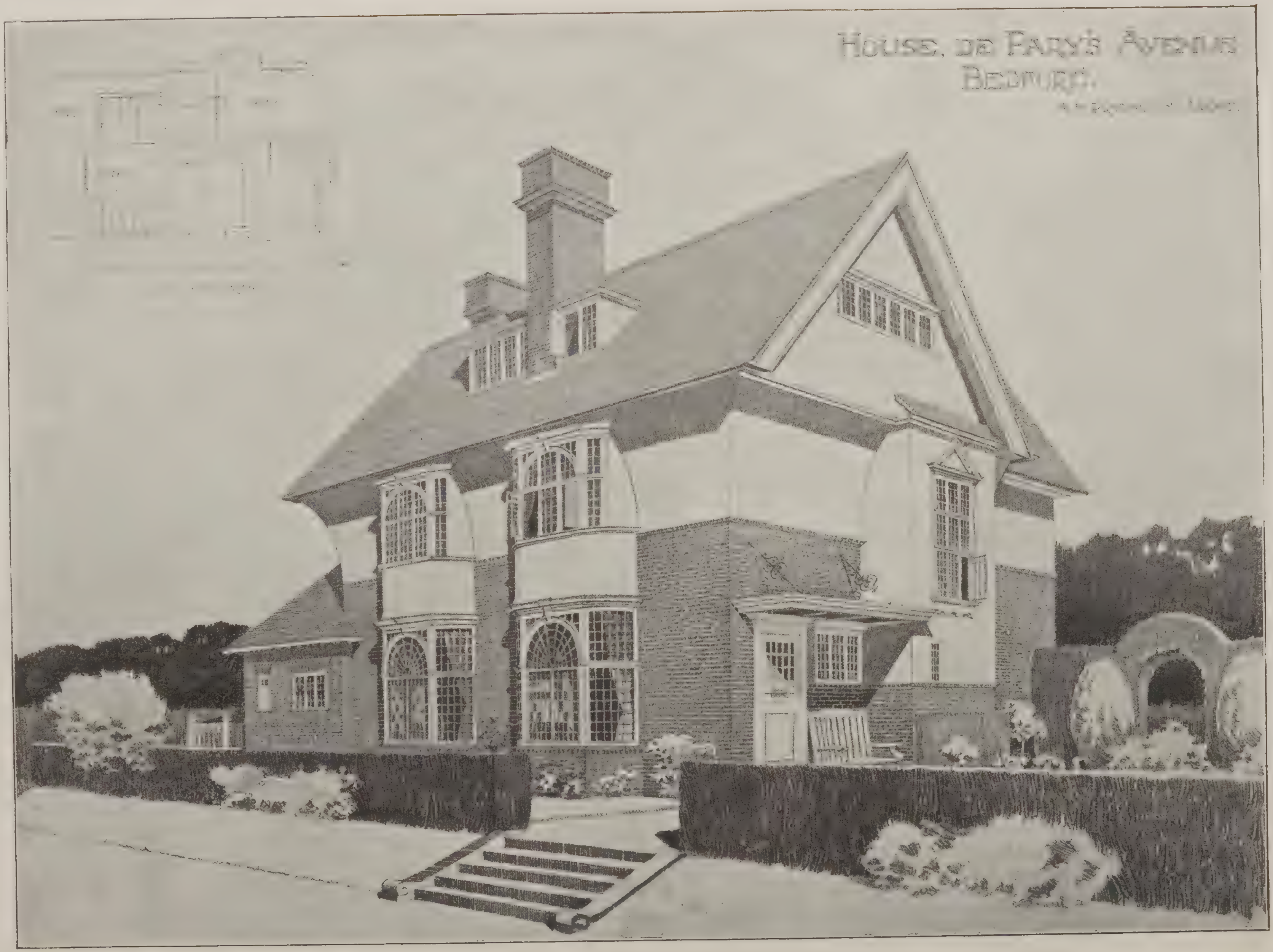
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, June 26th, 1901.



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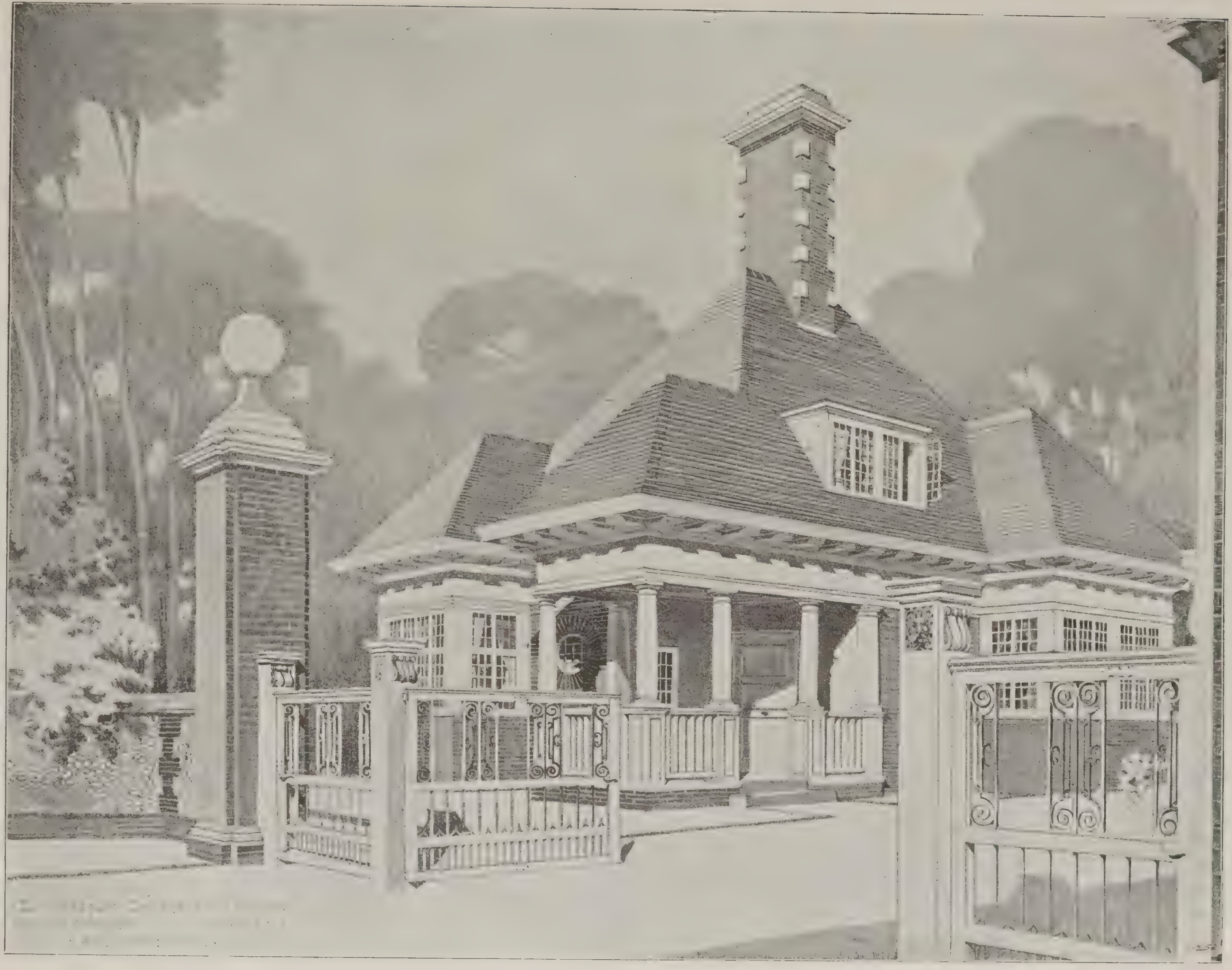

ENTRANCE GATES AND LODGE, CAVENHAM HALL, SUFFOLK. A. N. Prentice, Architect.

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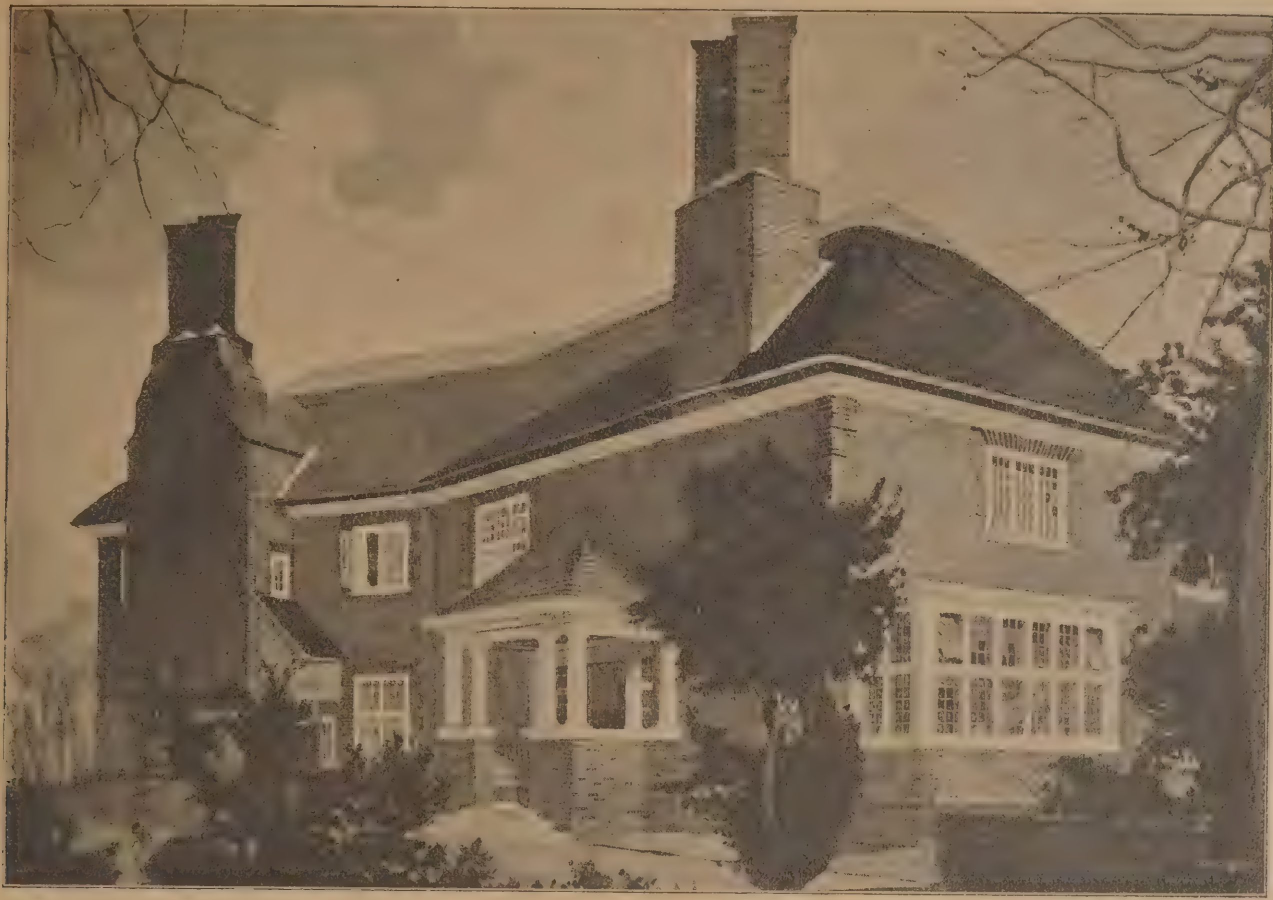


THE RETREAT, LAKENHEATH, SUFFOLK. DRAWN BY THE ARCHITECT, A. N. PRENTICE.

Builders' Notes.

The Basford Workhouse, Nottingham, has just been supplied with the patent Manchester grates and special inlet panels by Messrs. E. H. Shorland & Brother, of Manchester.

The Gloucester and District Master-Builders' Association held its annual general meeting recently, when the report and balance-sheet for the year were adopted. The president (Mr. G. O. Estcourt), the vice-president (Mr. William Jones, jun.), the committee (Messrs. A. King, jun., A. Dunn, T. Gurney, W. T. Nicholls and W. J. Parker), and the secretary (Mr. F. White, Zetland Chambers) were all re-elected. References were made to the quietness of the building trade and the not very encouraging prospects of improvement. Owing to the uncertain state of the trade, notices of a reduction of a ½d. per hour in wages, to take effect June 24th, had been sent to the bricklayers and carpenters and joiners' societies. The labourers have asked for an advance of a ½d. per hour, but this the Association has been unable to grant.

Building Contracts at Aberdeen : A Protest.—A meeting of builders, house proprietors, property agents and others interested was recently held at Aberdeen for the purpose of considering what action should be taken in view of the movement set on foot some time ago by the Associated Architects' Society in Aberdeen for establishing certain working rules between themselves and the different trades. The following resolution was passed : "This meeting expresses its strong condemnation of the selfish action taken by the Aberdeen Society of Architects in endeavouring to bring the whole building trade into the hands of a few, who call themselves the Society of Architects, and as being against all sense of fairness, legitimate competition and justice, especially so in view of the fact that the amount of work which passed through their hands during the last two years only amounts to about one-third of the work done by the whole building trade of the city during that period."

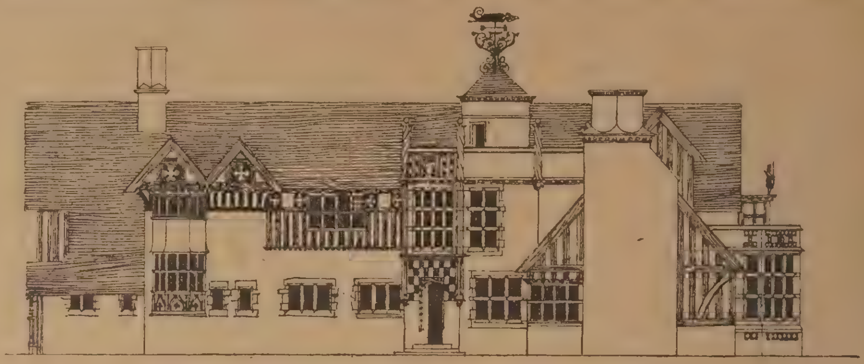
British Fire Prevention Committee's Visit to Hamburg and Antwerp.—In continuation of their participation in the Berlin Fire Congress (reported on p. 378 of our last issue) the Committee paid a special visit to the city of Hamburg, where a deputation comprising Mr. Edwin O. Sachs, Mr. Farrow, Mr. Goad, Mr. Marsland and the assistant secretary were cordially received by the head of the building police, the chief of the fire brigade, and other representatives. The visitors were first received at the headquarters of the fire brigade, after which a number of the new fire stations of the Hamburg brigade were visited. Next the various warehouses in the free port were carefully examined, and finally a large American liner was visited. In the evening the party was entertained at dinner, when Mr. Sachs had an opportunity of expressing the Committee's thanks for the reception. In conclusion of the deputation's visit to the Continent they informally visited the scene of the large fire at Antwerp where the enormous bonded warehouses covering about seven acres of ground, comprising many structures of five floors height, had been entirely gutted.

London County Council.—At last week's meeting Mr. John Burns drew attention to the threatened destruction of the magnificent view from Richmond Hill. He hoped the Council would see its way to co-operate with other bodies, including the City Corporation, with a view to preserving that splendid space. Mr. Henry Clarke remarked that Richmond Park itself was saved in the early part of last century by the Corporation. Lord Monkswell, chairman of the Parks Committee, said the Council were much interested in the statement made by Mr. Clarke. He hoped it would be an incentive to the Parks Committee to do something towards preserving the view alluded to. The Bridges Committee reported that on May 26th last the shield at Greenwich Tunnel reached the Greenwich shaft, and an opening was made to allow a passage from the tunnel to the shaft ; and by the end of the month the junction was rendered perfectly secure. The actual tunnelling work was now complete, save for the special ring at the junction with the inside plates of the Greenwich shaft. The rate of progress from the commencement of the work, including time lost for holidays, had been 5ft. 6in. per day, or 33ft. per week for a period of thirty-six weeks. It was very satisfactory to the committee to be able to report that the work had been carried on with very few accidents, and that there were only three cases of compressed-air sickness of sufficient gravity to deserve compensation from the Council.

Law Cases.

An Architect's Claim for Sketches "to Attract Tenants."—The case of *Gilford* v. *Taylor* was recently heard at the Croydon County Court. In October, 1900, the plaintiff, an architect of Purley, was requested by the defendant to prepare sketches of some houses she proposed to build, the sketches being intended for exhibition with a view to attract tenants. Plaintiff charged £12 12s. When he had done the sketches the defendant asked him to waive his claim if she employed him to prepare the plans and specifications for the houses—fifteen in number—which she proposed to build on Russell Hill. Plaintiff consented to this, and prepared the plans and specifications, which were, however, rejected by the defendant, who employed another architect. On the suggestion of the judge, when the case was first heard on April 2nd last, the case was referred to the president of the Royal Institute of British Architects to appoint an arbitrator. The president nominated Mr. Hilton Nash, of Bush Lane House, E.C., who took the arbitration on May 15th. On June 4th Mr. Nash made an award in favour of the plaintiff, and on the application of plaintiff's solicitors judgment was now signed for £37 10s. and costs.

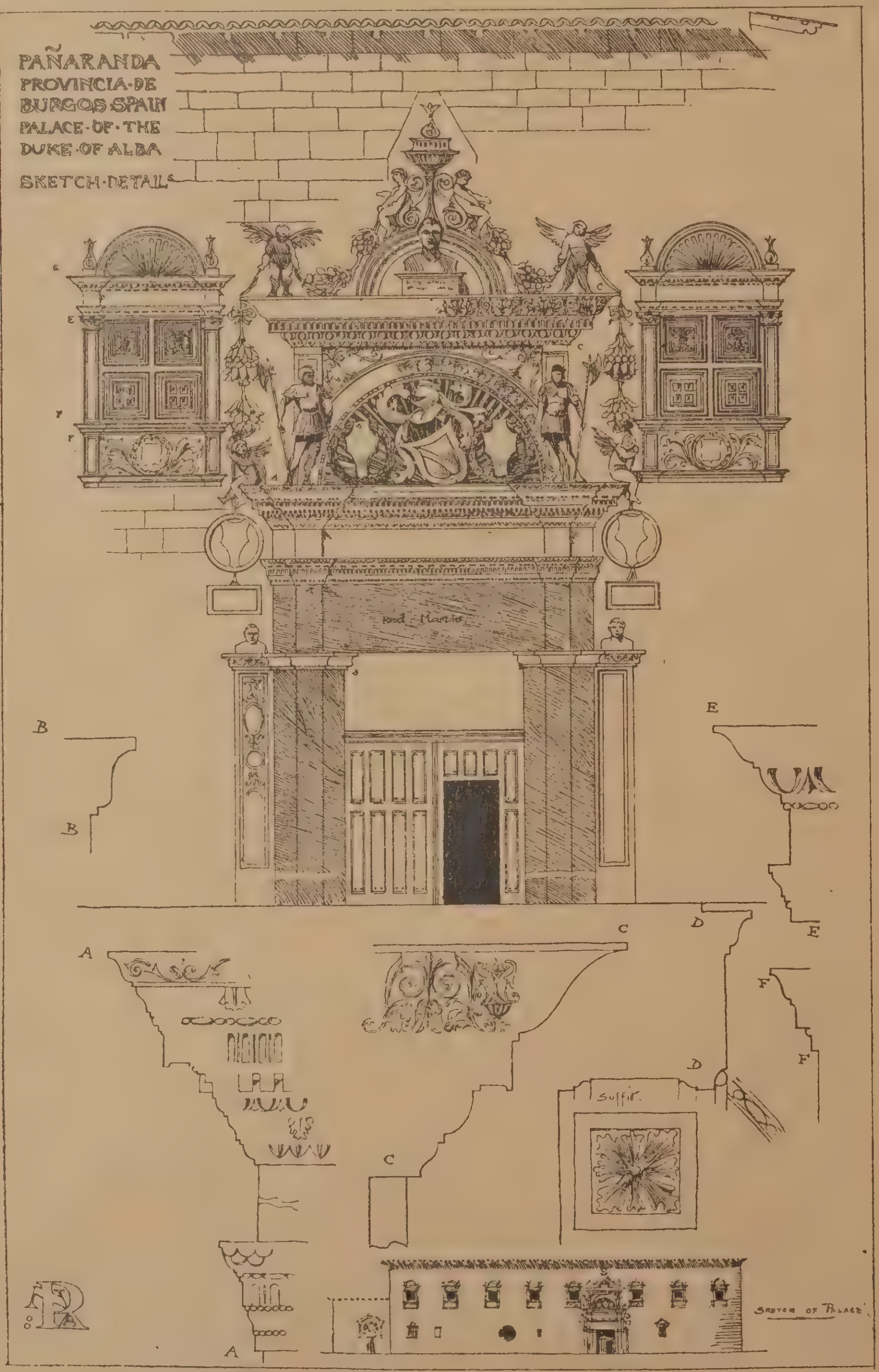
Agreements restraining Architects from Practising.—On June 14th, in the case of *Portsmouth* v. *Seward* (see p. 299 of our issue for May 22nd last), Lords Justices Rigby and Collins discharged the order of Mr. Justice Kekewich restraining the defendant till the trial from carrying on business as an architect at Swansea. in breach of the agreement under which plaintiff purchased Messrs. Seward & Thomas's business



PROPOSED COUNTRY HOUSE. A. N. PRENTICE, ARCHITECT.

there. The defendant had won the competition for new offices for the Swansea Harbour Trust, and the question was whether the agreement prevented him from carrying out the work. Their Lordships said the agreement expressly provided that if anyone wished the defendant to act for him in Swansea he was not to be restrained from so doing. There was nothing to prevent the defendant from sending in designs in the competition, and if he was successful there was nothing to prevent him from undertaking the work if requested to do so. The appeal was allowed with costs against plaintiff.

The Submission of Plans for Brick Kilns.—A case involving an interesting point in connection with the working of clay mines was dealt with at the Halifax Borough Court on June 14th. Messrs. J. Morton, Ltd., brickmakers, Cinderhills, were summoned by the Halifax Corporation for a breach of the by-laws in erecting a brick kiln at their works without having first submitted plans of the building to the Corporation. Defendants had erected a brick kiln on a site about 14yds. from the mouth of the clay mine, and their contention was that they were exempted from the requirements of the Act under sub-section E of section 2, which exempts "buildings used or intended to be used exclusively for the working of such mine." The question for the Court to determine, therefore, was—"Is a brick kiln adjacent to a clay mine, using the product of such mine, part of the working of the mine?" For the prosecution Mr. George Buckley and Mr. W. H. D. Horsfall, architects and surveyors, were called and said that the process of burning bricks had nothing to do with the working of a clay mine. The first-named witness said he knew of cases where clay was carried about a mile to the kiln, and he had known of instances where clay mined in the Halifax district was carted to Huddersfield kilns. For the defence Mr. James Mellors, of Wakefield, district inspector of mines, was called, and stated that he had supervision as inspector over the kiln as well as of the mine. It was, in his opinion, part and parcel of the working of the mine. In reply to the magistrates' clerk, the witness stated that he had no supervision over the erection of the kiln. Cross-examined, the inspector said that he had supervision over the kiln because it was adjacent to the mine. Mr. W. G. Gray and Mr. R. Edgar Horsfall, surveyors, said that they regarded the kiln as part of the mine, and Mr. George Fitton, mining engineer, Leeds, expressed similar views. The assistant town clerk pointed out that the fact of Inspector Mellors' having supervision over the kiln did not bar the operation of the Public Health Act. If the building were situated at a distance from the mine it would be under the supervision of the factory inspector, and in that case the Public Health Act would be in force. He stated, in reply to the Bench, that the by-laws adopted by the Corporation were the model by-laws of the Local Government Board. After a hearing which occupied nearly three hours, the chairman announced that a majority of the Bench were of opinion that the kiln was "used exclusively for the working of the mine," and the summons would be dismissed. It is understood that the Corporation will appeal.



DRAWN BY A. N. PRENTICE.

Effectual Drainage: An Interesting Case.—The case of *Mathews* v. *Strachan* (stated by justices) was heard last Thursday in the King's Bench Division of the High Court of Justice. An information was laid by the respondent, as clerk to the Harrow Urban District Council, against the appellant for erecting a house in Lyon Road, Harrow, without constructing such covered drains as appeared necessary by section 25 of the Public Health Act, 1875. Two sewers have been laid by the council in Lyon Road North, within 100ft. of the site of the house, one for the reception and conveyance of surface water only, the other for the reception and conveyance of sewage only. Before erecting the house the appellant deposited plans. The council's surveyor made a report that the requirements for the effectual drainage of the house were: (*a*) One main drain of not less than 4in. internal diameter, for conveying sewage only, to be . . . . connected to the council's sewage sewer; (*b*) one main drain of not less than 4in. internal diameter, for conveying surface water only, to be . . . connected to the council's surface-water sewer. The council, after considerable discussion, passed a resolution approving the appellant's plans, subject to the requirements contained in the above report being carried out. The defendant did not lay two drains as required by the notice and report, but one only in the manner shown on his deposited plans. The justices held that they had no power to question the reasonableness of the requirements for the effectual drainage of the house, and convicted the appellant. The Court held that the justices were wrong. Section 25 of the Act empowered the local authority to take into consideration certain matters, and only certain matters, for the purpose of satisfying themselves whether the drain proposed was effectual for draining the house, namely, the size, material, level and fall. If matters beyond the requirements of the section were asked for, it was in effect asking the owner of the house to subscribe to a general system of drainage. That was not the intention of the Act. The decision of the justices was therefore reversed. Appeal allowed.

Bricks and Mortar.

APHORISM FOR THE WEEK.

Art is the child of Nature.—LONGFELLOW.

Preservation of Derwentwater. CANON RAWNSLEY, vicar of Crosthwaite, Keswick, and honorary secretary of the National Trust for the Preservation of Places of Historic Interest or Natural Beauty, has made an appeal for help in the purchase of a part of the foreshore of Derwentwater. This is the first attempt to nationalise in the only practical way—namely, by purchase—any portion of the Lake District. Public access to Derwentwater is confined to a very few places only. The plot it is proposed to purchase has been declared to be in the market, and what is desired is to rescue it from the speculative builder. It borders the lake for a mile on the western shore, is of 108 acres in extent, and gives access to the hills above. The price required is £7,000, of which £2,000 has been promised. Donations should be sent to the Secretary of the National Trust, 1, Great College Street, Westminster.

The Bismarck Monument. THE Monument to Bismarck, erected in front of the Reichstag, and unveiled recently, is the work of Herr Reinhold Begas, the well-known sculptor. The statue, which is of bronze on a marble pedestal, stands on a lofty plinth of variegated granite, to which steps lead up on all sides. The spike of the helmet is almost as high as the roof of the Reichstag. Bismarck is represented above life-size, in the well-known undress uniform of his Cuirassiers. The cloak is spread over a column. A document or map, upon which his right hand rests, lies upon it, while the left hand grasps the handle of his sword. The figure is upright; the strongly-chiselled head, gazing into the far distance, is covered by a helmet thrown a little back, thus fully exhibiting the high forehead. The central pedestal is surrounded by four fountains presided over by water-nymphs and goddesses. On the pedestal itself are bas-reliefs, one representing the apotheosis of Bismarck and the other the attacks on the great statesman by the unclean birds of Party and Press. On the plinth from which the pedestal rises are four groups symbolising Bismarck's labours for the Fatherland. The first is Siegfried forging a sword, the second is the symbolical figure of a woman resting on a Sphinx, the third is Germania with her foot on a panther's neck, the fourth is Atlas with the globe on his shoulder. The entire cost of the monument was £60,000.

"New Art" Furniture. THE Secretary of the Board of Education, secondary branch, announces that Mr. George Donaldson has presented to the Victoria and Albert Museum a collection of "new art" furniture. Mr. Donaldson, who is an accepted authority on all matters pertaining to furniture, modern and old, was in 1889 elected vice-president of the jury of awards for furniture at the Paris Exhibition, and was unanimously chosen again last year as vice-president of the recent Paris Universal Exhibition. In the process of making the awards, Mr. Donaldson noticed that in the past eleven years a remarkable and distinct art development had taken place all over Europe, causing a mercantile change of quite exceptional proportions, but one of which England was practically unconscious. On learning that the Victoria and Albert Museum had insufficient funds for allocation to this particular branch of art, and could not, therefore, place before English designers, craftsmen and manufacturers the choicest European examples of the "new art" production in furniture, Mr. Donaldson wrote to the President of the Board of Education and offered to purchase a selection of the best examples of "new art" furniture in the Paris Exhibition of 1900, and to present them to the Victoria and Albert Museum. His object was to exhibit them in the first instance at the museum and then to send them for exhibition successively to our chief manufacturing towns, in order that the manufacturers and artisans of this country might see what other nations are striving for in the direction of original design not based upon past productions. The collection is now arranged in the tapestry court of the art museum.

Ivory Carving in the Punjab. MR. ELLIS, an Assistant Commissioner in the Punjab, has lately published in India an interesting monograph on the art of ivory carving in that province, which appears to be a comparatively modern one there. In Delhi, which is the chief seat of the industry, it is almost exclusively a hereditary occupation. The whole trade of Delhi is practically in the hands of one family, the head of which pays the carvers. Some of the latter are paid very high wages, for at the last moment a slip through carelessness or want of skill might spoil the work of months. Prices are sometimes very high, as much as £500 having been given recently for a piece of carved ivory. At Amritsar, another centre of the industry, the work is less elaborate in its character, and consists chiefly of bangles, toys, combs, paper-cutters, card-cases, and the like. Hoshiarpur is the chief centre of inlaying and the manufacture of decorative furniture. Some of the inlayers prepare a stock of their goods with which they travel all over India, selling them to private purchasers. In Patiala, too, under the patronage of the late Maharaja, ivory carving has been carried on, chiefly that of bangles. At Ludhiana the turning of billiard balls has become a regular, though small industry. But, according to Mr. Ellis, the art of ivory carving as a whole does not flourish in the Punjab, although the work of Faqir Chand at Delhi and Ghulam Hussain at Hoshiarpur is famous all over the world. The raw material comes from Africa, Burma and India; but Indian ivory is of inferior quality, on account, it is said, of the food of the animals and the inferiority of breed, climate and surroundings. The industry, with few exceptions, is confined to the large towns, the purchasers of the carving being mostly Europeans. The designs, Mr. Ellis says, are Indian, the imitation of European models not having yet invaded the art.

Liverpool School of Architecture. AN exhibition of architectural and decorative designs, modellings, copper-work, examples of enamels, woodcarvings, &c., by students of the Liverpool School of Architecture and Applied Art, was opened recently by the Lord Mayor (Mr. Arthur Crosthwaite) at the Walker Art Gallery. Professor Simpson, the director of the school, in speaking of its work, said that seventy-three students had attended the day and 171 the evening classes during the past session. There was one point to which he would like to refer, and that was the fact that a special aim of the school was to pay great attention to the arts and crafts allied to architecture. In Germany the manufacturers and others were in close touch with the higher technical schools, and it was to that fact that the great progress made during the past few years was in a large measure due. He thought that those of Liverpool should take advantage of the training given, and still being given, to students in that school. The Lord Mayor, in opening the exhibition, said that the Corporation had given £1,000 to the school, and had made a further grant of £400 in consequence of the good work done. The Corporation were wishful to encourage such progressing work, and the fact that the work was progressing was emphasised by the increase in the number of those who attended the school. There were no fewer than twenty different crafts taught, and they were really trying to help that which was beneficial to the trade of the city. They wanted to encourage local talent; the school was one of the first of its kind in the country. The exhibition closed last Saturday.

Appointment of Architects by Rural Bodies. A DEPUTATION from the Council of the Royal Institute of the Architects of Ireland waited on the Local Government Board recently. The deputation consisted of Sir Thomas Drew, P.R.H.A., F.R.I.B.A.; J. Rawson Carroll, F.R.I.B.A.; R. Caulfield Orpen, F.R.I.A.I.; Charles A. Owen, F.R.I.B.A.; & W. Kaye Parry, M.A., F.R.I.B.A., hon. secretary. The object of the deputation was to bring under the notice of the Local Government Board the appointments of unqualified men as architects by the Urban and Rural District Councils in connection with the expenditure of public funds. The deputation was courteously received by the Vice-President, Sir Henry Robinson, K.C.B., and other members of the Board. Sir Thomas Drew stated shortly the position occupied by the Royal Institute in connection with the profession which it represented. Mr. W. Kaye Parry then read a statement embodying the views of the Council, and suggested that the Local Government Board should endeavour to secure increased powers to make regulations regarding the qualifications of architects employed by Urban and Rural District Councils. The chairman thanked the deputation for having brought this matter under the notice of the Board, and added that the suggestions of the Council would be very carefully considered.

Half-Timber Houses at Lincoln. MESSRS. WATKINS & SON architects, presented a report to the Lincoln City Council recently upon the old "half-timber" buildings on the High Bridge belonging to the Corporation. They said that the buildings appeared to have been originally erected as three small dwelling-houses, each with a single room on the ground floor, and in the corner of each room was a steep and narrow staircase leading to the rooms above. Each storey above the ground floor overhangs that below it by about 15in., so that the top or second storey overhangs the outside face of the ground floor about 2ft. 6in. All the constructional timbers were of English oak, and were originally exposed to view on the outside and inside faces of all the walls, and, fortunately, nearly all of them still remain. The architects considered that there would be no insurmountable difficulty in restoring the building to its original form and appearance. While retaining the shops they would endeavour to restore the building in all other respects to its original condition and appearance, except as regarded the steep and narrow staircases, for which they would substitute more suitable staircases in the annex they proposed to build at the back. It was difficult to estimate the cost of the restoration, but they were of opinion that it would be about £1,000 or £1,200. The Corporation has decided to have the buildings restored.

The Architectural Museum. THE annual general meeting of the Royal Architectural Museum and Westminster School of Art was held last week at the Museum, Tufton Street, Westminster. Mr. W. Emerson, the president, was in the chair. Mr. J. P. Seddon moved that Mr. Emerson be re-elected president for the current year. This was seconded by Mr. S. Lee, and carried unanimously. Mr. Emerson, in accepting, expressed the hope that they would soon be in a more flourishing condition. They were at present in a state of transition, and he would do his best to aid them. The adoption of the report of the council was moved by Mr. M. B. Adams, who said that through the good offices of the president a closer connection had been brought about between the museum and the Royal Institute of British Architects, which had promised an annual donation of 20 guineas to the funds. The finances of the institution were in a satisfactory state, but a heavy and immediate outlay was in contemplation, it having become necessary to renew the roofs of the older portions of the buildings. The council hoped that not only the old friends of the museum, but the profession generally, would make individual efforts to assist in meeting this exceptional expenditure. The Westminster School of Art continued to well maintain its high reputation. There were some people who thought very little of the splendid collection of casts they had there, but, as a matter of fact, those casts were of inestimable value. In keeping them together they were rendering a great service to the country. At present the old national style of architecture (Gothic) was much neglected; but a time would surely come when architects would again adopt it more largely than they now did. Mr. W. Pain seconded the adoption of the report. Speaking in support of the motion, the chairman drew attention to the very heavy outlay impending not only for repairs but also in the contemplated addition of Renaissance and other styles of casts. He promised 20 guineas towards that object. Mr. Seddon also promised 10 guineas.

SOUTH KENSINGTON EXAMINATIONS.

QUESTIONS AND ANSWERS IN BUILDING CONSTRUCTION.—Honours: Part 1.

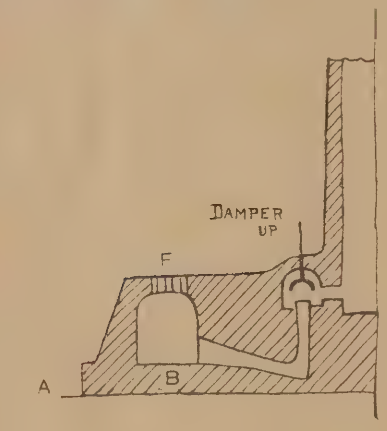
[NOTE.—The questions and answers in the Elementary stage were published in our issue for June 12th, and those in the Advanced stage in the following issue. In the Honours examination it was not allowable to answer more than six questions, of which at least one was to be selected from each of the first two divisions and two from the last.]

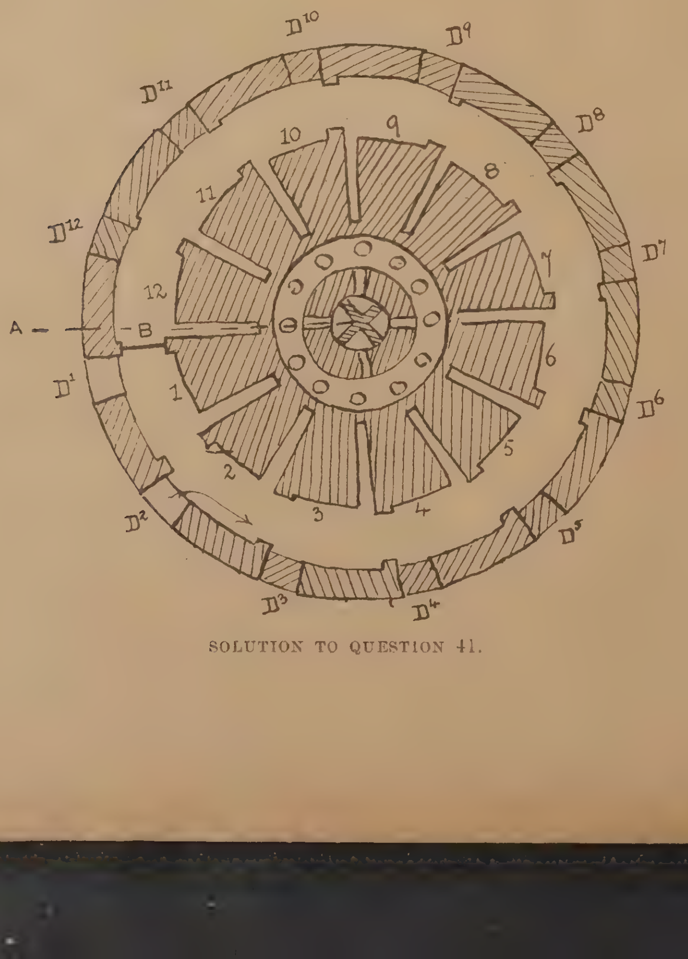
DIVISION I.

41. *Sketch a sectional plan and a sectional elevation of a Hoffmann kiln. Explain, referring to your sketches, the scientific principle of the kiln, and describe the practical working of it.*

(See accompanying illustrations.)

The kiln is designed so that the burnt bricks while cooling will heat the air going to support combustion, where bricks are being burnt, and so that the gases (the products of combustion) shall be applied to bricks about to be burnt, to heat those nearest the fires in order to make them ready for firing, and to warm and thoroughly dry those more remote. 1, 2, 3, etc., to 12 is an annular chamber properly built and lined to stand a high temperature. There are twelve flues from it to a chimney. Each flue is capable of being shut by its damper. At B is shown an iron shutter shutting off 1 from 12 (it is possible to similarly shut off 1 from 2, and so on for the twelve sections). In the roof of each section there are openings, called fire-holes, through which fuel can be applied to the sections which are burning at any time. The openings marked D^1, D^2, &c., are closed everywhere (with bricks and sand), except at D^1 and D^2, which are open as shown on the sketch. The fire-holes are kept closed, except when fuel is being sent down. We shall suppose the kiln to be in regular work. Section 1 is being filled with bricks from the hacks, while section 2 is being emptied of burnt bricks. All the remaining sections are full of bricks, spaces being left for the working of the shutters B; 3, 4, 5 and 6 are in stages of cooling, 7 and 8 are burning, 9 is very hot, getting ready for firing, 10 is less hot, 11 is warm, and 12 is drying. All the flues are shut off from the chimney, excepting flue 12. On the following day 1 may have been filled with bricks, the shutter will be down between 1 and 2, flue 1 will be open to the chimney, shutter between 12 and 1 will be up; all flues except flue 1 will be closed, door D^3 will be open, D will be built up, and the fires will be in 8 and 9. In this way there will be a regular rotation, and finished bricks will at regular intervals be taken from the doors in succession—moving, in a sense, against the hands of a watch, as shown in the sketch.





SOLUTION TO QUESTION 41.

42. *What is the difference between cast iron and steel? Describe a forge test by which you would determine whether a small sample is cast iron or steel.*

What is mild steel, and how is it made?

In comparing cast iron with steel, it is advisable to recollect the *ordinary popular distinction* between these materials. Cast iron is employed for grates and ornamental castings, and is comparatively easily broken with a blow; if a cast-iron ornament falls on a hard surface, such as earthenware or glass, it will break, though of course it is stronger than these. Steel is familiar in knives and cutting tools, and the material is associated with ideas of strength in maintaining an edge without gapping, and hardness to enable it to penetrate other hard materials. It is found that both cast iron and steel are combinations of iron (an element) and carbon (another element), and that a material is cast iron if there is more than, say, 2 per cent. of carbon, while it is steel if there is less than, say, 2 per cent. of carbon. As building students, we had better not involve ourselves in chemical language. With such a distinction, it is natural to expect that close to the line it will not be easy to say which is steel or cast iron; at some distance from this critical line the distinction is well marked and discrimination easy, and for building purposes we are not concerned in very nice distinctions—it is easy to distinguish between cast iron and steel.

The easiest forge test where rough tests are doubtful is tempering. If you heat a piece of steel to the proper temperature, and dip its point, the first hardness of the point will reduce with the heat travelling down from the part undipped. Cast iron will harden with heating and dipping, but it will not soften with a lower temperature than that at which it has been dipped. Mild steel is iron and ·16 to ·5 of carbon. It is produced in various ways. The following is a brief description of the Siemens-Martin process: A quantity of molten highly-heated cast iron is prepared in a furnace, heated scrap, wrought iron or steel is added and dissolves, and samples are taken from time to time and tested to learn the proportion of carbon in the metal. This stage is managed so that the proportion of carbon shall be ·1 per cent. To it is now added spiegeleisen, to give the desired proportion of carbon, and the metal is discharged at the proper time into ingot moulds.

43. *Describe carefully the composition of good Portland cement, and explain fully its manufacture.*

Specify good Portland cement, and explain minutely how it should be tested.

Portland cement is produced by burning, in a suitable kiln, an intimate mixture of limestone and clay, and then grinding the "clinker" (the burnt mixture) to a fine powder. The details of the manufacture differ in different localities because the ingredients are found in different physical conditions. Where limestone is found soft as chalk, and clay also soft, the practice is to pug these materials together in the proportion of 3 of chalk to 1 of clay (with a sufficient allowance of water) into slurry. This slurry is strained, settled and dried, and when fit it is fed into the kilns and burnt. After burning it is ground.

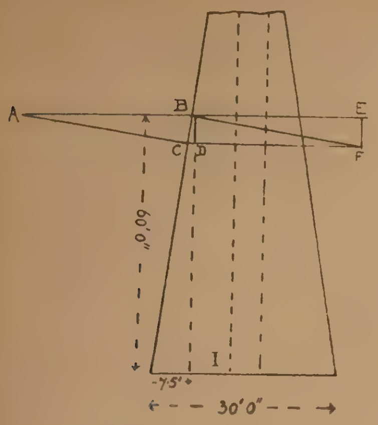
Specification.—The Portland cement shall be delivered in good, cool, working condition. The bags shall contain no lumps of damaged cement or of other foreign matters. The specific gravity shall be 3·1. It shall be finely ground equal to cement that will pass through a sieve of 32,000 meshes to the sq. in. (gauge of wire 48 B.W.G.), leaving a residue not greater than 10 per cent. Its tensile strength after seven days (from filling mould) shall be not less than 350lb. per sq. in. (neat cement). It shall be properly burnt, and its composition shall be of the best proportions.

Testing.—Thermometer test: The temperature should not greatly differ from the average shade day temperature. Test specific gravity in specific-gravity bottle. Fineness is best tested for in a continuous way by first passing a quantity of cement through a sieve of the specified fineness, then passing 10 per cent. of the residue through a sieve of 2,500 meshes, mixing these together, and gauging with standard sand. Briquettes made of this gauged stuff should be broken in the usual way and the record preserved. Any further purchases of cement should give as good a tensile strength with identical sand. Fine-meshed sieves cannot be maintained in sufficiently good condition to allow their behaviour to be sworn to. Fair samples are taken from various parts of the consignment, mixed, formed into briquettes in the usual way in brass moulds, and broken in a proper testing-machine after seven days (twenty-four hours in the moulds in a damp place, and six days out of the moulds in water). Put a pat of cement on glass and place in water. When making neat briquettes, test for setting. Fill a bottle with cement made to a proper consistency with water.

DIVISION II.

44. *A square mill chimney is 3,000 tons in weight: it is so bonded and built that it may be taken, under the conditions of the question, as one homogeneous mass. Its bottom bed is square, 30ft. by 30ft., with a 6ft. by 6ft. flue in the centre. Taking the force of the wind at 50lb. per sq. ft. on an area of 3,000 sq. ft. (centre of gravity of area 60ft. up) blowing at right angles to side of bed; batter of side of chimney 1½in. to 1ft.: find (a) maximum pressure per sq. ft. at lee edge of bottom bed, (b) minimum pressure per sq. ft. at windward edge, and (c) the total pressure on the bed.*

Referring to the accompanying illustration, A C is at right angles to the side. A B is horizontal. The batter being $\frac{1}{8}$, $\frac{BC}{AC} = \frac{1}{8}$. The sides of the triangle A, B, C are proportional thus: $AB : AC : BC = 1 : {·99} : {·124}$. The number ·99 may be determined by drawing with sufficient accuracy, but it is easy arithmetic remembering that the square on the hypothenuse is equal to the sum of the squares on the sides. A B = 50



SOLUTION TO QUESTION 44.

× 3000 = 150,000lb. Resolve this force tangentially and normally, and we get 150000 × $(1-\frac{1}{100})$ = 148500, which is the force B F—we have no use for the tangential component: resolve B F horizontally and vertically, and we find $148500(1-\frac{1}{100}) = 147015 =$ B E $\text{BD} = \frac{\text{BE}}{8} =$ 18377. This force B D may have its point of application transferred to I. Moment of B E with respect to G H = 147015 × 60. Area of base = 30 × 30 − 6 × 6 = 864 sq. ft.

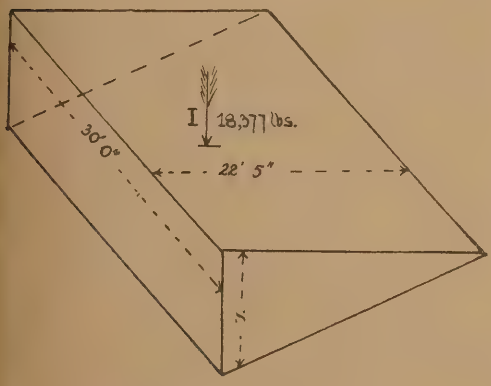
(1) Pressure per sq. ft. due to weight of chimney $= \frac{3000 \times 2240}{864} = 7777{\cdot}7\ldots$

$147015 \times 60 = p_1 \frac{2\,\text{I}}{30} = p_1 \frac{\text{I}}{15}$, where p_1 is the extra force per sq. ft. at H and I, the moment of inertia of the base $\text{I} = \frac{30^4 - 6^4}{12} = 67392$.

(2) $\therefore p_1 = \frac{147015 \times 15}{67392} = 1{,}964$lb. per sq. ft.

This force will be of the same amount at G, but of opposite sign.

As regards the pressure, 18,377 lb. at I (see accompanying illustration), if we take account of the *elasticity* of the material we shall be led into considerations which are beyond the scope of this question, and we assume that the brickwork is perfectly rigid so far as this comparatively small pressure is concerned. This force will be balanced by a system of parallel forces acting upwards, whose *centre* shall be in the line D I, and these may be represented by the volume of a wedge $\frac{30 \times 22{\cdot}5 \times s}{2}$, where s is the maximum force per unit of area.



SOLUTION TO QUESTION 44.

(3) $\therefore s = \frac{2 \times 18377}{30 \times 22{\cdot}5} = 54$lb.

a. From (1) and (2) 7777·7 .. + 1964 = 9741·7 .. lb. per sq. ft.

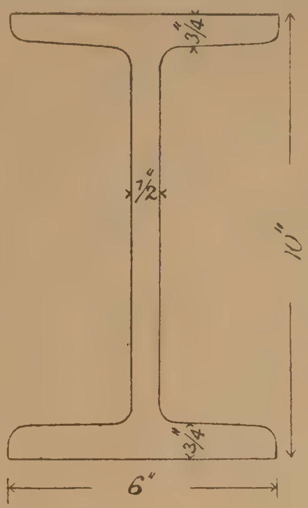
b. From (1), (2), (3) 7777·7 .. + 54 − 1964 = 5867·7 .. lb. per sq. ft.

c. 3,000 tons + 18,377lb. = 3,008 tons 4 cwt. and 91lb.

45. *Determine graphically the forces in the members of the roof truss shown. Mark the amount on each member in cwts., putting + for compression and — for tension.*

(See accompanying illustration.)

46. *Section of rolled steel joist: what is its weight per ft., approximately? Placed on bearings 12ft. apart, what distributed load will it carry approximately, the stress in it being limited to 4 tons per sq. in.?*



Area of flange = $4\frac{1}{2}$
" " = $4\frac{1}{2}$
" web = $4\frac{1}{4}$

Area of section = $13\frac{1}{4}$ sq. in.

36 cub. in. weigh 10lb.

$\therefore \frac{13{\cdot}25 \times 12 \times 10}{36} = 44{\cdot}16$ b. is *weight per ft. of joist.*

$$\frac{\text{Load in tons} \times \text{length between bearings}}{8} =$$

bending moment at middle point, where it is a maximum.

Neglecting weight of joist and also neglecting bending moment value of web,

Load in tons =

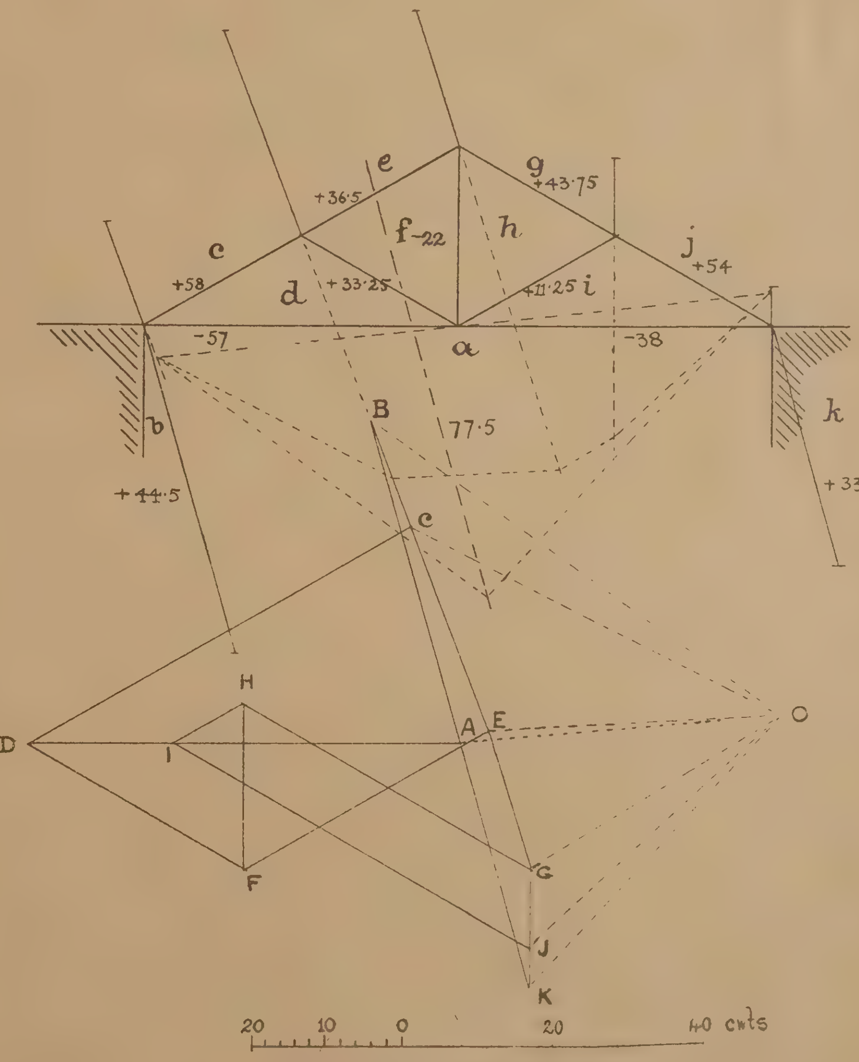
$$\frac{4{\cdot}5 \text{ sq. in.} \times 4 \text{ tons} \times \frac{9{\cdot}25}{12} \text{ dist. bet. flanges in ft.} \times 8}{12}$$

$$= \frac{4{\cdot}5 \times 4 \times 9{\cdot}25 \times 8}{12 \times 12} = 9{\cdot}25 \textit{ tons dist. load.}$$

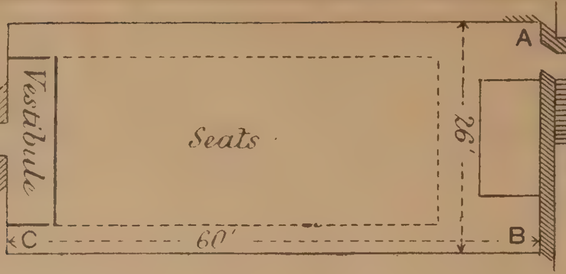
DIVISION III.

47. *You are to design and specify carefully a high-pressure small-tube hot-water heating system for the small church shown on plan. The pipes are uncovered, and they are placed in a cement recess between the wainscotting and the floor. Ceiling 18ft.*

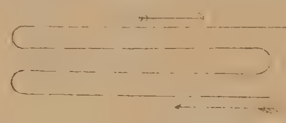
The works to be done shall include the excavation of the floor of the furnace-room to a sufficient depth, so that the coil-boiler shall be well below the floor of the church. The walls shall be carefully supported during the excavation, and all things shall be done to make them good and secure in every way. The finished surface of the floor of the pit shall be 5ft. lower than the floor of the church. There shall be a landing 3ft. 6in. by 3ft. 6in. at the door, and there shall be a secure iron railing and an iron ladder from this landing to the floor of the boiler pit. The floor shall be 9in. thick of concrete, finished smooth on surface. The sides shall be made up with concrete 18in. thick, smooth on face. A proper and sufficient chimney shall be built to a sufficient height to which the flue from the coil-boiler shall be connected. A 12in. ventilating pipe shall be brought from the outer air to the pit (such a pit should be well ventilated, as there is great danger from carbonic oxide). The boiler shall be a well-made coil of 100ft. of pipe with all



SOLUTION TO QUESTION 45.



necessary firebars, casing, &c., and proper connection shall be made to the flue of the chimney with damper, &c. The pipes shall everywhere have a fall towards the coil. The pipe from the bottom of the coil shall branch into two: these branches shall reach the points A and B at 6in. above the floor level. The pipe from the top of the coil shall also branch and reach the same points 1ft. 6in. above the floor level, and, avoiding all obstruction to doors, &c., the pipes shall be carried along the walls showing four lines of piping for the whole length of the church. The two upper lines will be carried close to the wall to the outer door of the vestibule on each side. The expansion pipe shall be at C. The whole of the material shall be of the very best description, and the installation shall be fitted with all necessary cocks for the regular testing, supplying with fresh water and every matter and thing that a good high-pressure small-tube heating installation should have. The pipes shall be of ⅞in. bore, and shall be carried on iron hook standards properly fixed. The installation shall be tested by an hydraulic testing pump by the contractor, in the presence of the architect, to a pressure of 1,000lbs. per sq. in. The contractor shall also guarantee absolute steam, &c., tightness at every part. The tubes, iron ladder, railing, &c., shall be painted with suitable enamel paint. Every matter and thing disturbed shall be made good and complete in every respect, and a complete work satisfactory in every respect shall be handed over by the contractor.



48. *Specify, exactly and fully, for the connection with main and the complete wiring and fitting of a town residence (£100 valuation) for electric lighting. Give a detailed estimate of the cost.*

Wires.—All the electric conductors shall be of high-conductivity copper, covered with best insulation. They shall be the goods of a well-known manufacturer. They shall be run in proper casing, and the work shall in every respect conform to the Fire Office rules. The casing shall not show, except where agreed upon, and conductors of sufficient sectional area shall be brought to each lamp and wall socket. A reasonable test of the sufficiency of the conductors shall be to turn on all the lights and take the pressure at each lamp. There should not be more than two volts' drop at any lamp.

Switches and Cut-outs.—The contractor shall supply a good double-pole main switch sufficient for the full current, with lights all on, and a double-pole cut-out. There shall be a good, neat enclosed distributing board controlling three circuits, namely, the basement, the reception rooms and passages (2), and the bedrooms (3). It shall be placed on the wall near the foot of the stairs (first floor), where the hall widens near the library door. It shall be fitted with proper switches and cut-outs. The lights in the dining-room and those in the drawing-room shall be in sections, so that more or fewer lights may be turned on at switches placed near the door outside the rooms.

All wall sockets for table lights shall be connected to one only of these circuits. In the basement, servants' apartments and bedrooms each light shall have a separate switch with a cut-out in its base. In other places each electrolier and bracket shall have a switch and cut-out. All these switches and cut-outs shall be properly fixed to proper bases and properly connected to the conductors. All electroliers, brackets and suspended lamps shall be properly wired with flexible wire of the best quality. They shall be properly put up and connected. All points shall be fitted with best bayonet sockets. The estimate provides for plain best fittings of every kind. The proprietor will be at liberty to substitute other fittings on giving due notice, and he shall pay the difference between the list price of plain fittings and that of the fancy fittings increased or diminished as shown in the schedule hereto.

(Here should follow a list of the rooms in the house, with a detailed instruction as to the number of lights suspended, brackets, and electroliers, shades and lamps for each room, with references to catalogues from which they have been selected. It should also give the positions of lights, wall sockets, table lamps, &c.)

The contractor shall communicate with the electric supply company to test the installation, to connect with their main, and to put in the meter. He shall also fill up the certificate for the fire insurance company, and he shall satisfy the company in every particular.

Estimate.

Basement - - - -	10 lights.
Ground floor - - -	30 „
First floor - - - -	25 „
Second floor - - -	10 „
Third floor - - - -	6 „
Total - - -	81 lights.

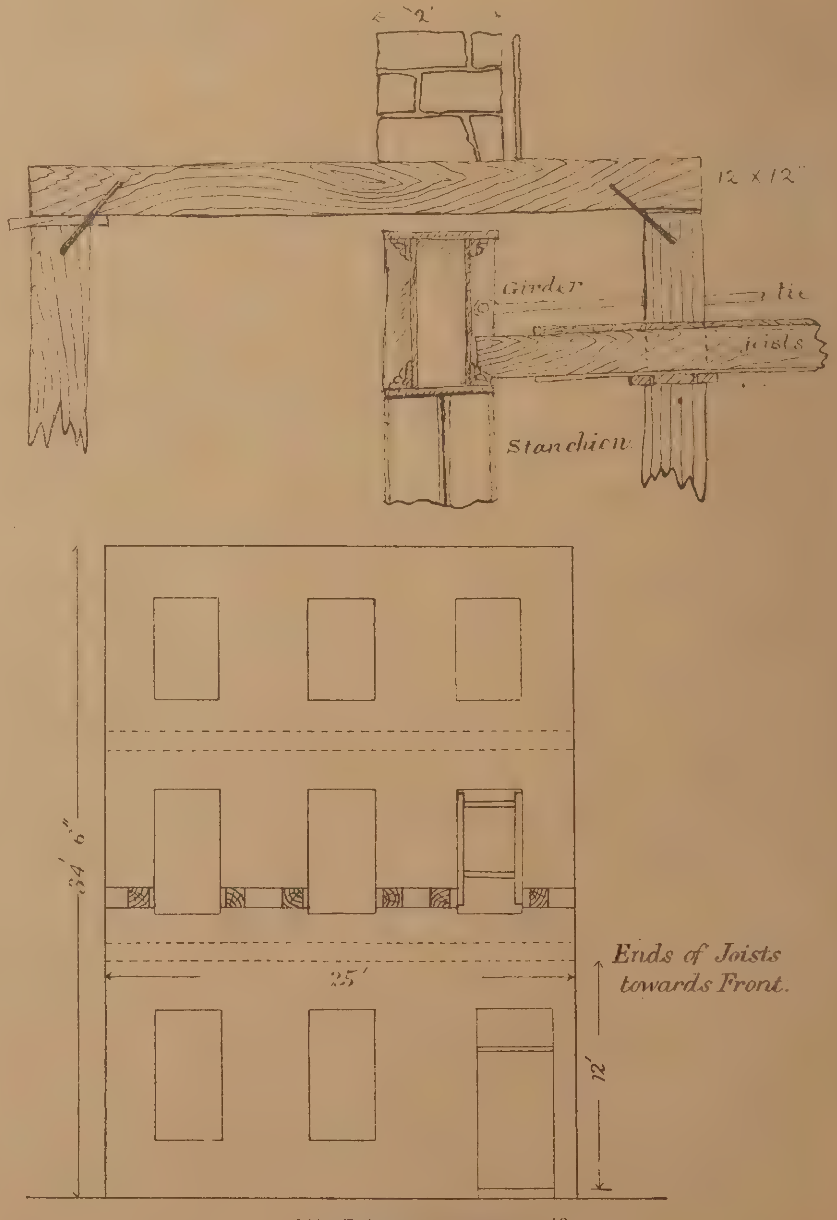
Wiring, switches, sockets, bases, roses, suspended lights, plain brackets, will average for such a house 15s. a point:—

	£	s.	d.
Eighty-one at 15*s.* - -	60	15	0
Electrolier, breakfast-room -	5	0	0
Library - - - -	5	0	0
Drawing-room - - -	20	0	0
Four brackets at £3 each -	12	0	0
Shades - - - -	5	0	0
First set of lamps - -	5	0	0
Total - - -	£112	15	0

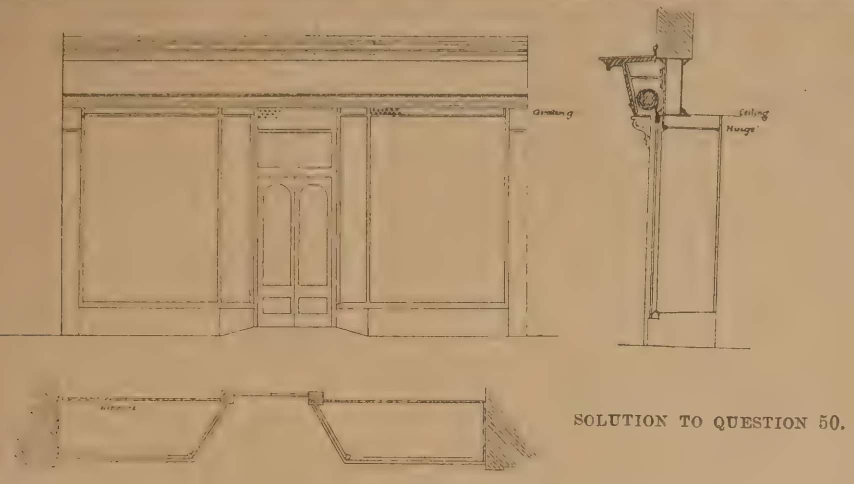
To this must be added the company's charge for putting in the service.

(Note.—A specification in answer to a question of this kind cannot be minutely detailed, but the answer should show that the student knows what he is talking about. We have given a very different answer to that which we should give if the question were set in a paper on Electrical Engineering.)

49. *Show by sketches and explain fully how you would alter the dwelling-house shown to a shop, so far as removing as much of the lower part of the wall as necessary and putting in and supporting the beam is concerned. The wall is*



SOLUTIONS TO QUESTION 49.



SOLUTION TO QUESTION 50.

rubble masonry, there are shops both sides, and the owner desires to have the opening as wide as possible, both to be in the centre.

(See accompanying illustrations.)

The first thing is to make a reasonable rough estimate of the weight, above the level of the first floor: 25ft. × 22ft. × 2ft. − (3 × 3ft. 6in. × 6ft. 6in. + 3 × 3ft. 6in. × 5ft. 6in.) × 2ft. = 848 cub. ft. of rubble masonry at, say, 15 cub. ft. to the ton; say, 60 tons; add for roof, allowing for wind, say, 5 tons: total, 66 tons. Floors are to be supported independently of walls during change, but their weight and probable loads must be provided for in designing the girder and its supports. The wall will be carried on needles resting on dead shores. If six needles are used we must provide them able to carry slightly more than 11 tons each, and we must place them where the wall may safely deliver this pressure to them. Shore all floors from the ground up, using 9in. by 3in. planks, placing these flat on floors and ceilings, with uprights to fit between, and keeping a convenient distance from the front wall. Strut all windows, putting uprights against reveals and driving horizontal struts tightly between—4½in. by 3in. pieces will probably be found heavy enough for this work.

Pieces of pitch-pine (or other fir timber) logs 12in. by 12in. will serve for needles and dead shores. If each needle is to carry 11 tons, each dead shore will have less than this. Care is to be taken that its connection with the ground shall be sufficient and safe. The place should not be encumbered with too much timber. It may be found convenient to place the inner dead shores so that their heads will reach the plank which is pressed against the ceiling at points between pairs of joists. Holes should be cut in the flooring over these, and blocks put in (if thought necessary the plaster may be also cut away), reaching, say, 2ft. above the floor level, to carry the inner ends of the needles. The outside dead shores are put up with their tops at the proper level, and stayed. Holes are now cut for the needles which are put in in succession, care being taken to see that the masonry bears properly on the needle, if necessary making it to fit with spauls and cement mortar. The full pressure is put on the needle by wedging, the wedges made fast by spiking, and dogs driven between needles and shores. There should be two needles under each pier between windows, and one under each outside pier. Everything being now thoroughly examined and found to be safe, the masonry may be cleared away from below.

By encroaching upwards a little on the first-floor windows, room could be found for a girder 3ft. deep resting on sufficient bearings at each end, so that the whole frontage will be available without any intermediate pillar. The end pillars or stanchions should each be able to carry a load of 50 tons. They should rest on good wide bed-plates to distribute the weight, and these should be bedded on blocks of concrete of sufficient bearing-area. As there are shops on both sides, care should be taken to tie the ends of the girder back to the party walls, as otherwise there may be insufficient tying; the former stability of the adjoining premises may have been owing in part to the masonry now being removed. The masonry may now be made good between the girder (which I take to have been provided of the proper section to carry, say, 100 tons on a 23ft. span, and hoisted to its place resting on the stanchions, having the bottom of its lower flange nearly in line with the ceiling, so as to give as wide an opening in every way as circumstances will allow) and the wall; the needles may be taken out in succession, and the needle-holes properly made good. The flooring joists must be properly trimmed, defective ends properly spliced, and the whole housed on to a bearer properly attached to the girder. The shoring may now be removed, and the place cleared of timbers.

50. *Draw to the scale of $\frac{1}{48}$th an elevation of a jeweller's shop front for shop as in the previous question; draw a vertical section showing roller shutter, and a horizontal section showing door, pillars, outside plate glass and the glass enclosure of the window on the inside. Explain how you would prevent internal moisture obscuring the glass.*

(See accompanying illustrations.)

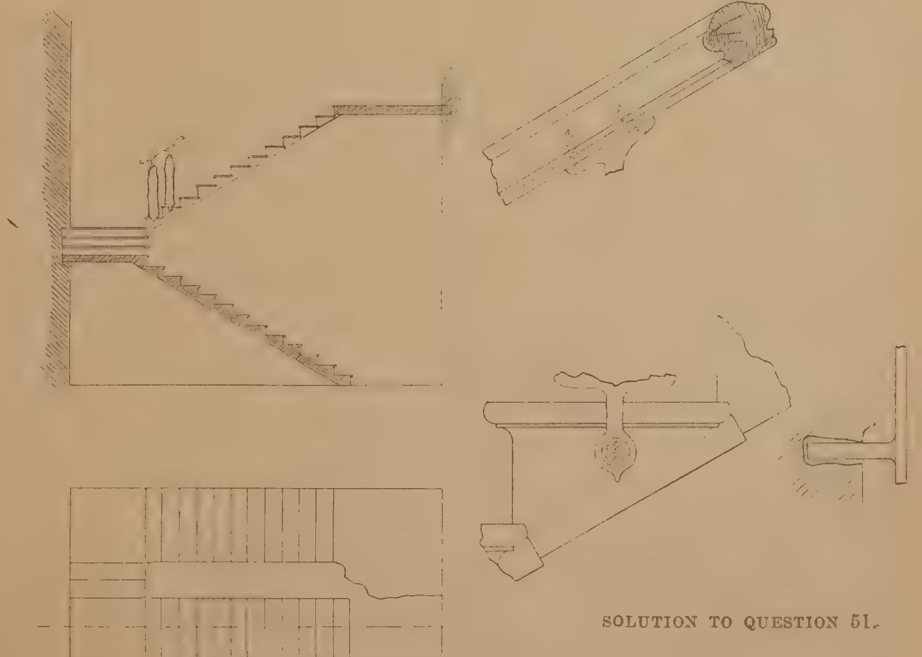
In regard to condensation trouble in enclosed windows, ventilation is a remedy. Where electric light is used, there should be little trouble of this kind. Gas in burning gives off a good deal of steam, forming a warm moist atmosphere. The inside doors are opened from time to time to take out and replace goods; the moist air of the shop enters and deposits its moisture on the cool glass, and the place tends to become a "trap" for moisture. In ventilating it is necessary to have regard to dust: owing to rapid variations of pressure during puffs of wind, much dust may enter a grating which can hardly be made fine enough to stop dust. Some loose layers of cotton wool or slag wool may be used behind the grating in a proper receptacle, and this should be so arranged that the "wool" may be taken out and renewed occasionally.

51. *In a rectangular stairway 20ft. by 10ft. place a good stone staircase, steps 4ft. long; height from floor to top of top landing 15ft. Draw plan and vertical section (scale $\frac{1}{48}$) through one flight, showing elevation of ends of steps of second flight, show at least 2 balusters. Draw, to $\frac{1}{4}$ scale, section of handrail; show details of fastening of balusters both to steps and handrail.*

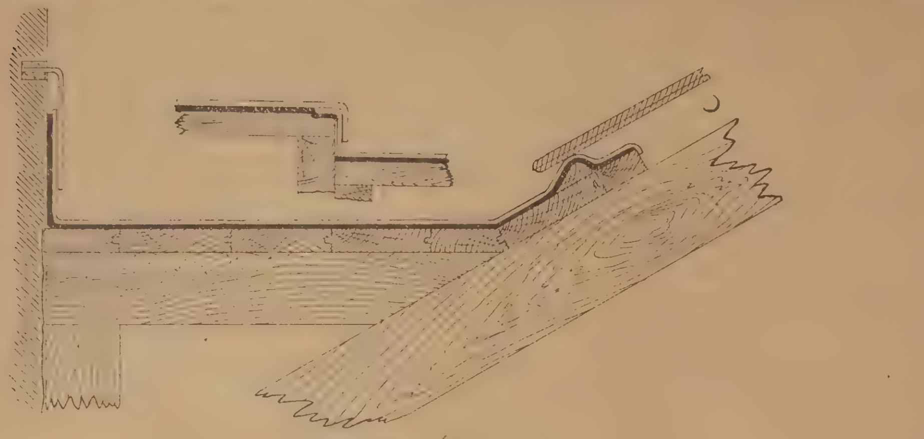
(See accompanying illustrations.)

52. *The sketches* (not reproduced) *show cross-section through a workhouse dining-hall, and broken plan. The lead gutters at* A *are defective and are to be removed; any defective rafters are to be spliced. Explain how you would direct new gutters of a proper kind to be put in. Give working drawings and sketches, and provide for a complete and workmanlike job.*

The whole of the slates from the gutter to the ridge shall be carefully taken off and put aside for the re-slating. The old battens shall be taken off (the ridge and hip tiling being, of course, removed for this side), and all defective rafters shall be made good by removing the defective parts and by side splicing at the purlin. All other defective woodwork—wall-plates, bearing pieces of every kind, hip rafters, &c.—shall be thoroughly made good. Everything being thus made good in accordance with the original design of the roof, a bearer shall be fitted to the bottom end of each rafter for a proper lead gutter. The new gutter shall fall from the centre both ways; it shall have a roll in the centre; there shall be four steps on each side of the centre roll, counting the drop over the hip as a step; the lengths of straight gutter shall be equal, and they shall have a fall to the step of about 2in. The bearers shall be sheeted with 1¼in. tongued and grooved flooring well and carefully laid, and this boarding shall be carried at least 9in. up the rafters, having its upper edge horizontal, being eased in thickness as may be necessary at the steps. The wall along the sheeting shall be well cleaned and picked out, and it shall be made smooth and good with cement plaster up to the bottom edge of the raglet, which has been cut for the cover flashing. A light tilting fillet shall be nailed on to the edge of the sheeting. If necessary, the slates from the bottom ends of the hips to the eaves shall be taken off and re-slated with proper wide soakers, properly turned up for cover flashing. The raglet mentioned above shall be cut for the whole length of the roof at the proper height, it shall be cut of sufficient depth, and the opening shall be made regular by making up with cement mortar. The whole of the sheeting shall now be covered with good heavy roofing felt, and this felt shall rise



SOLUTION TO QUESTION 51.



SOLUTION TO QUESTION 52.

also for 6in. up on the wall. The gutter shall now be laid in 8lb. lead well and accurately dressed everywhere, it shall be turned over the tilting fillet, and it shall not be nailed anywhere. The cover flashing shall be of 5lb. lead: it shall be in 3ft. lengths with 4in. laps and having the hidden edge turned up, and then laid nearly flat.

Views & Reviews.

Bricklaying.

This little book of eighty pages, by Mr. Owen B. Maginnis, of New York, is, as might be expected, decidedly American in its character, both as regards the practice, the descriptions, and also its introduction and announcement of contents, for we read "the whole making an invaluable book of reference for architects, engineers, contractors, builders and mechanics." However, we will not quarrel with the author's evident appreciation of his own work. Altogether the book is useful to those who have no (or slight) knowledge of bricklaying. We have already lost much by the decease of the old apprenticeship system, but to expect to create good bricklayers from a cursory reading of a book is absurd. There are, of course, a few useful hints to be obtained from this book; but it is a pity that these are overweighted with descriptions and illustrations of tools, and the way to lay a brick—information that can best and almost only be acquired from example and personal instruction. The book is divided into two parts, the first dealing with bricklaying, and the second with shoring, needling, underpinning and sheet piling. The illustrations are often very roughly done.

"Bricklaying." By Owen B. Maginnis. Price 2dols. Published by the Author at 810, West 128th Street, New York City, U.S.A.

Gasfitting.

For many years past we have been overwhelmed with books upon subjects one would have thought hardly needed to be taught other than by word of mouth and example, or dealing at great length with subjects that it would not have been imagined there was so much to write about. The book now under review falls into the latter category; here description follows description *ad nauseam* with regard to work that any gasfitter of any practice in his trade, and with a knowledge of its principles, would have no hesitation whatever about doing. Then there are long descriptions accompanied by illustrations of the various tools used in gasfitting, information which almost every person connected with the trade—and often not—knows. When technical processes are described, they are always involved and verbose, whereas by seeing them done they are better understood, and in a much shorter time, than by the written description. Thus the book describes the cutting and drilling of pipes, &c., with pages of letterpress, when the thing could be shown in ten minutes and remembered always afterwards. The author seems to have taken every kind and example of work he is acquainted with in gasfitting, and described its fixing and manipulation from its foundation upwards, so that the elementary processes are gone through over and over again, in regard even to alternate forms of the same thing. We have no hesitation in saying that the book could have been condensed into a quarter of its present size, and that with advantage as regards clearness and usefulness. The book, it appears, is the outcome of a series of articles contributed to a trade paper, and this may account for its verbosity. The illustrations in the book are not good, being often too small, badly drawn, and in some cases obscure. Notwithstanding the size of the book, we think a chapter on the chemistry and physics of gases, their flow, and action on pipes and the materials they are composed of, should have been given.

"A Handbook of Practical Gasfitting." By Walter Grafton, F.C.S. 5s. nett. London: B. T. Batsford, 94, High Holborn, W.C.

Roof Framing.

This book, by Mr. Owen B. Maginnis, a Yankee architect, will be found of considerable use to architects, as it gives very clearly the methods of laying out and framing roofs adapted to modern construction. The book illustrates and deals with a number of roofs of fanciful shapes, such as hexagonal, conical, octagonal, circular &c., which are often designed, but not a word of warning is uttered as to the reprehensibility of the practice, which leads to weakness, waste of material, and difficult and laborious workmanship. A chapter or more might also have with advantage been added upon graphic methods of calculating stresses in roof trusses, and the consequent method of designing the sizes of the timbers required.

"Roof Framing made Easy." By Owen B. Maginnis. Price 1dol. Published by the Author at New York.

Municipal Engineering.

We welcome this small booklet, of about twenty-five pages, describing how to become a municipal engineer. Such a work has been needed for some time, and similar ones dealing with other professions—such as architecture, civil engineering, sanitary engineering, surveying, electrical and mechanical engineering, &c.—would be extremely useful. The author has very well performed his task, and offers many useful hints to persons intending to take up municipal engineering, and his remarks are worthy of careful attention. The book, too, is published at a price which places it easily within the reach of everyone. In addition to the advice, there are also given questions set at one of the recent examinations of the Association of Municipal and County Engineers.

"How to Become a Municipal Engineer." By J. Freebairn Stow. Price 1s. nett. London: The St. Bride's Press, Ltd., 24, Bride Lane, Fleet Street, E.C.

New Offices for the Perth Parish Council have been taken in York Place, and are being renovated and reconstructed from plans by Mr. Marshall, architect, of New Scott Street. The following tradesmen have been appointed to execute the work: Mason, Mr. William Tait, Errol; joiners, Messrs. Peter Johnston & Son, Perth; plumber, Mr. Peter Duthie, Perth; slater, Messrs. James Buchan & Son, Perth; plasterer, Mr. John Sharp, Perth; glazier, Mr. Charles Alexander, Perth.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Right of User.

LLANGOLLEN.—ANCIENT writes: "On certain property of mine there was an old ashpit into which twelve cottages threw their ashes. Twenty years ago I roofed and slated this empty space, and have since kept it in repair. Can the tenants of cottages 3, 4 and 5 (plan not reproduced)—which cottages are the only ones not belonging to me—claim part use of it now? Before I cut a door-opening in it there was no means of entering at all."

The rights of the owners of 3, 4 and 5 to use the ashpit were extinguished by the pit being closed, especially as the closing has been acquiesced in for so many years. The owners of 3, 4 and 5 have, consequently, no *locus standi*, and can be prevented by injunction from cutting the door and also sued for damages.

A. O. H.

Sketching around Glasgow.

CARDIFF.—SKETCHER writes: "I propose to spend a month at Glasgow this summer, with a bicycle, for the purpose of sketching and measuring. Kindly name the chief places of architectural interest in, and within a thirty mile radius of, Glasgow."

The district around Glasgow is, architecturally speaking, somewhat barren. In the city itself the principal object of interest is the Cathedral, which is a somewhat severe example of thirteenth-century work (founded 1197), with additions of the fifteenth century. There is some elaborate stonework decoration in the crypt, and the interior is richly decorated. Though designed on a cruciform plan, the transepts were never completed. Of modern buildings the most important are the University, by Sir G. G. Scott, and the Municipal Buildings by William Young. Dumbarton Castle is within the suggested radius, and there are also at Dumbarton a tenement bearing the date of 1623 which has some good sculptured enrichment, and the fifteenth-century Collegiate Church of St. Patrick. The Abbey Church of SS. James, Milburga and Mirin at Paisley is another thirteenth-century building, and contains a series of four sedila and a piscina of fourteenth-century date. Edinburgh, with Holyrood and Rosslyn, are both beyond the radius named, but ought to be visited if possible. In the BUILDERS' JOURNAL for the following dates a series of articles appeared on "An old Glasgow Architect on Some Older Ones," which, dealing with the chief buildings in and around the city, will be of interest to querist: July 23rd and 30th, August 6th, 13th, 20th and 27th, September 3rd and 10th; all of 1895.

G. A. T. M.

Widening Masonry Road Bridge.

GLASGOW.—F. H. writes: "I am studying how to widen a bridge 8ft. on each side. The bridge is a masonry one, having one 65ft. span, 35ft. between parapets. I can only think of the scheme I enclose (not reproduced), *i.e.*, by steel cantilevers at about 35ft. centres. I do not like the cross girder, because it cuts up the roadway for pipes and conduits. Can you suggest any other method of anchoring the cantilevers? Also, how can I calculate the overturning moment?"

If the bridge has been properly designed in the first instance, there will not be sufficient margin of strength to allow it to be widened upon the same arch and foundations, apart from the unsightliness such an alteration would cause. Cantilevers have also the objection of greatly increasing the stress over the average at the face of the arch, and of concentrating the load at certain points upon an arch designed for a uniform load. It is a matter that cannot be settled by a small sketch, as the present construction of the bridge will want careful consideration. HENRY ADAMS.

Stone for Nave Pillars.

NORWICH.—FOUR YEARS A READER writes: "Several of the stones of the plain octagonal pillars of the nave of a church are cracked badly, owing to the unequal settlement caused by interments, the stone, apparently Totternhoe, being of insufficient strength. Can you recommend a fine white stone, of great strength, with which to replace the pillars? Its appearance must harmonise with the Totternhoe."

You will have to pick the quarry to match samples of the stone, which so varies that it is impossible for us to say offhand what stone would exactly suit. Totternhoe is an argillacious limestone, and another limestone should therefore be chosen. We think that you will most probably find what you want at the Wardour quarries. If you could find a bed of the right colour and texture at the Portland quarries (the white stone, not the brown Portland), it would be excellent as regards hardness.

Relative Costs of Concrete Paving.

NORWICH.—FOUR YEARS A READER writes: "What is the relative difference in cost between finishing concrete paving with granite chips and Portland cement 3 to 1, and ordinary sand and cement 3 to 1, about 1in. or 2in. thick?"

The paving we presume you mean to be laid *in situ*. One inch would not be thick enough, 1½in. being the least advisable, and that only on a very good foundation. Paving made with granite chippings in the proportion you name, 2in. thick, would run about 6d. per ft. super., and that of sand and cement about 4½d. per ft. super.

Right of Light.

BANGOR.—W. G. W. writes: "Kindly state whether the owner of the lock-up shop B at the corner of a street (sketch not reproduced) can erect a screen or otherwise obstruct the light of the side window recently erected on A.'s adjoining premises. The local authorities decline to allow B. to bring out the frontage more if he erects new premises on the site. Therefore A. claims that no one can obstruct the light now enjoyed. The old window on A.'s premises was erected about twenty-five years ago, but the new one only last year."

If the land at D belongs to B., he would be within his rights in erecting a staging upon it so as to obstruct the light to the new window, but not if this land be a part of the main road, and therefore public property. Had the new window occupied the exact position of the old window, it could not have been interfered with, but by changing its position the right of light previously enjoyed has been abandoned. That it would be ungracious for B. to obstruct the window, under the circumstances, is another matter. Probably, if the land at D be his, he would accept a small rent for the privilege of outlook. G. A. T. M.

Setting-Up Perspectives.

MARKET HARBOROUGH.—PERPLEXED writes: "I am setting up a perspective, and find that one of the V.Ps. strike the picture plane within the building (sketch not reproduced). Would this give a distorted picture? I wish to reduce from ¼in. scale plan to $\frac{3}{16}$in., and the line of height is taken where the building cuts the picture plane. Will the new line of height be found by vanishing on to the new picture plane?"

It is by no means uncommon for one of the vanishing points to occur within the limits of the picture, especially in what is known as "parallel perspective" and interior views. No distortion results. The line of height would be in the position indicated. G. A. T. M.

Government Appointments.

LONDON, N.W.—P. H. writes. "I desire to obtain the position of architect and surveyor in one of the Government offices, and should be glad if you could give me any hints. Are there any examinations held, and are berths publicly advertised?"

See reply under heading "Assistant-Surveyors, Civil Service" on p. 380 of last week's issue.

Occupying Newly-Built House.

WATFORD.—NEW SUBSCRIBER writes: "I am having a small house built, and should be glad to know how soon after completion it is safe to occupy it. It has been built—so far as the walls and roof are concerned—during the recent drought, and at present seems very dry. The plastering is not yet done."

Having been built during the dry season, it would be safe to occupy the house about a month after completion.

Formulæ for Strength of Beams.

STRESSES AND STRAINS writes: "Kindly give a set of formulæ for tranverse strength of beams, and also state whether the formulæ below are correct:—

(1) Cantilever, weight at end.

$$\text{Breaking weight} = \frac{\frac{1}{4} \times A \times D^2 \times S}{L}$$

(2) Cantilever, weight uniform.

$$\text{Breaking weight} = \frac{\frac{1}{2} \times A \times D^2 \times S}{L}$$

(3) Supported both ends, weight in middle.

$$\text{Breaking weight} = \frac{A \times D^2 \times S}{L}$$

(4) Supported both ends, weight uniform.

$$\text{Breaking weight} = \frac{2 \times A \times D^2 \times S}{L}$$

(5) Supported at both ends, weight acting at a point *not* in centre.

$$\text{Breaking weight} = \frac{M \times N}{L} \times \frac{A \times D^2 \times S}{1}$$

L = length in feet: W = breaking weight in cwts.: A = breadth in inches: D = depth in inches: S = constant: M and N distance of weight from ends of beam."

The formula usually used for the calculation of the transverse strength of beams is derived from those for the moment of resistance and the moment of the load, which are required to be equal.

The moment of resistance $M^r = \frac{FI}{\delta}$, where F = tensile or compressive stress per unit of area (lbs. or tons. per sq. in.) and δ = distance of extreme fibres from neutral axis, and I = moment of inertia.

The moment of the load M_1 = *for beams fixed at one end*, load at end, WL, and for load uniformly distributed $\frac{WL}{2}$;

or *for beams supported at both ends*, load in middle, $\frac{WL}{4}$; load uniformly distributed, $\frac{WL}{8}$; and load at any other point, $\frac{Wmn.}{L}$

Here the letters signify: L, length of beam; m and n, length of parts into which it is divided; W, load.

Putting these formulæ equal, we have the transverse strength of a beam of any section to resist fracture. Thus, suppose the load is required for a beam of rectangular section, supported at the ends and loaded in middle. Then

$$\frac{WL}{4} = \frac{FI}{\delta}$$

$$\text{or } W = \frac{4FI}{L\delta}$$

Now the moment of inertia, for a square or rectangule strained in the direction of a side is $\frac{bd^3}{12}$, where b = breadth, d = depth.

Making $d = 2\delta$ we have

$$W = \frac{4Fbd^2}{6L}$$

b, d, and L being in the same terms.

These formulæ, however, often lead to erroneous results, unless applied with care and knowledge, and querist should therefore read up the subject carefully, which can best be done from Rankine and Hurst, the latter giving a useful digest of the formulæ and methods of application, and Rankine the theory.

With regard to the formulæ given by our correspondent, 1 to 4 are correct. The fifth should be

$$\text{Breaking weight} = \frac{L \times A \times D^2 \times S}{4 \times M \times N.}$$

Books to Study for R.I.B.A. Preliminary Examination.

PORTMADOC.—T. S. R. writes: "Kindly give the names, publishers and prices of the best books to study for the preliminary examination of the R.I.B.A. in the following subjects: History, French, Elementary Mechanics, Physics and Euclid."

Ransome's "Short History of England" (Longmans, Green & Co.); Macmillan's Progressive French Course (first year 1s., and second year 2s., Macmillan & Co.); Stewart's "Lessons in Elementary Physics" (4s. 6d., Macmillan & Co.); Briggs' and Bryan's "Elementary Text-Book of Mechanics" (3s. 6d., W. B. Clive, 13, Booksellers' Row, Strand, W.C.); Hall & Stevens' "Euclid" (4s. 6d., Macmillan & Co.).

Examinations for Municipal Engineers.

SHEFFIELD.—STUDENT writes: "What are the subjects of examination for the associateship of the Municipal and County Engineers' Association, and what books would be most suitable for studying; and, also, where must I apply for forms and particulars of the examinations?"

The address of the Secretary of the Association of Municipal and County Engineers is 11, Victoria Street, Westminster, S.W. We would advise you to get a small book by Mr. J. Freebairn Stone, entitled "How to become a Municipal Engineer" (published by the St. Bride's Press, Ltd., at 24, Bride Lane, E.C., price 1s. nett), which will give you all information with regard to study and books.

Openings for Architects in Australia.

E. J. P. writes: "What is the address of the Emigration Office? I wish to know whether there are any vacancies in architects' offices in Australia."

The address of the Emigrants' Information Office is 31, Broadway, Westminster, S.W. The openings for assistants in Australia are much the same as here, that is, there is plenty of scope for good men—those who are able and willing.

Paper and Pens for Perspective.

WELLINGTON.—PERSPECTIVE writes: "What is the best paper to use for perspectives, so that when illustrated the lines come out distinct: and what pen is most suitable for this work?"

A hard smooth paper should be used. Bristol board is the best, but the drawing-papers known as Joynson's or Arnold's take line and wash well. A rough paper causes too many reflected lights from the angles of its surface. A pen should be chosen by the user to suit himself. Too fine a pen, such as a mapping pen, is apt to cramp the hand and produce a niggling style. Fine and broad pens, goose quills, and even a sharpened stick are used, according to the quality of line that may be required. It is important to remember that every line will reproduce of the same value, and the gradations will therefore come only from the varying thicknesses of the lines.

Trade and Craft.

Measures Brothers, Ltd.

As makers of British steel joists of all descriptions Messrs. Measures Brothers, Ltd., have long enjoyed a high reputation; and by reason of the enormous expansion of their business during the last few years they have found it imperative to erect new and commodious premises on their own freehold property in Southwark Street, S.E. The firm keep a stock of at least 12,000 tons of joists ready for immediate delivery, which testifies to their resources; and their large circle of customers will be glad to know that, with the increased facilities, Messrs. Measures will be able to execute orders even more expeditiously than before.

Steel girders and joists are now being so increasingly employed in the erection of buildings and other structures, and the varieties needed by architects and engineers are becoming so numerous, that it is of incalculable advantage to be able to choose from a large stock; moreover, they are sometimes needed to be delivered most speedily, and Messrs. Measures Brothers are in a position to meet these requirements with the utmost despatch. The firm is best known for its joists, but they also have a large connection for tees, angles, channels, chequered plates, castings and sheets of every description. Those in need of such goods should consult Messrs. Measures.

Keystones.

The Old Parish Church of Merthyr Tydfil has been restored at a cost of £7,000. The tower was partially pulled down and rebuilt in order to receive a peal of bells.

Bolingbroke Hospital, Wandsworth Common, S.W., is being extended by the addition of a new outpatients' wing as a memorial to the late Queen. The new department is the first part of a hospital, with 150 beds, to cost £60,000.

The New Church of St. Columb, in Lancaster Road, North Kensington, has been opened. The site of the new church cost £2,000, and the building itself cost £7,000. The church is furnished with 500 chairs.

The New Church of St. Paul's, Grangetown, Cardiff, is being completed by the addition of a chancel. The portion of the church already erected has cost £4,150, and £2,500 will be required to finish the fabric according to the original plans.

Relative to the new Royal Theatre at Stockholm.—Mr. Frederick Lilljekvist, architect to the King of Sweden and attaché to the Swedish Office of Works, who has been entrusted with the arrangement and design of the new Royal Theatre at Stockholm, visited London last week to consult with Edwin O. Sachs and inspect the new stage arrangements at the Covent Garden Opera House, Mr. Sachs having been asked to report on the proposed scheme.

A New Parish Hall at Plymouth is being erected to be used as a mission church during the building of the new church of St. Simon's, which is to seat 1,000 persons, the foundation stone of which is proposed to be laid in the autumn. The parish hall will seat about 400; the contractor is Mr. Ambrose Andrews, of Plymouth, and the architect Mr. Harbottle Reed, of Exeter, who has also prepared the plans for the church.

The New West Block of the Church House, Westminster, is rapidly approaching completion, and will be finished and ready for occupation at the end of July. The principal room in the new block is the Hoare Memorial, which will be the permanent hall for the House of Laymen. It will be capable of seating between 400 and 500 persons, and will fill a long-felt want. The new portion will also contain improved accommodation for the library and twenty-three other well-lighted rooms to be used as offices for Church societies. The total cost of the work will be £22,200.

St. Martin's new Church, Heaton Norris, was consecrated recently. The church, inclusive of £900 for site, has cost nearly £6,000. The seating accommodation at present is for 420, but when the church is extended, as it is intended it shall be at some future time, it will be able to accommodate 620 worshippers. The style is Early English. The architect is Mr. R. B. Preston, of Manchester. The church as now built consists of a chancel, chapel, organ chamber, vestries, and three bays of nave and aisles, leaving three more to be completed at some future time. The principal feature of the building is the double transepts on each side, which give an air of spaciousness to the church. Generally, the church is built of local bricks and terra-cotta dressings inside and out. The roofs are of open timber. The pulpit is carved.

The Annual Report of the Architects' Benevolent Society states that, notwithstanding the amount received in subscriptions for the year was £522 0s. 6d., as compared with £469 3s. received in 1899, there was a balance at the debit of the account on December 31st of £42 11s. 11d. It is the first time in the history of the Society that such a deficiency has occurred, and it is due to the large number of urgent applications for assistance which were considered and relieved. This bears eloquent testimony to the great need of the Society for further support. It is hoped that the deficit may be promptly covered by the acquisition of a sufficient number of new annual subscribers. The number of applications for relief has been greater than in any previous year, being fifty-five. The sum thus distributed was £677 13s., while £112 10s. was paid to pensioners, making the total sum expended in relief £790 3s. Donations may be sent to the hon. treasurer, Mr. W. Hilton Nash, Bush Lane House, Cannon Street, E.C.

The New Additions to St. Thomas's Hospital were opened last week. These consist of a new ward for children and twin operating theatres side by side, which are the first instalment of the four to be there eventually.

Lynton's New Market is now complete, having been handed over to the Council by the contractors. The building, which is of local stone, with Bath-stone dressings, is lit with the electric light, and the whole is so arranged that it can be extended at any future time.

A New Vicarage for St. James' Church, Barrow, is being erected at the top of Hartington Street, and the cost will be about £2,000. Mr. E. M. Young is the architect, and the contractors are as follows: Mr. T. Brown, brickwork; Mr. Fairbairn, stonework; Mrs. Ormandy, joinery work: Mr. Ramsay, plumbing; and Mr. Walker, slating.

The Restoration of the West Front of the Bath Abbey, which has been carried out under the advice of Mr. T. G. Jackson, R.A., at a cost of about £2,000, is now completed. The more expensive work of repairing the flying buttresses, which was not originally contemplated, is still proceeding, and will, it is expected. bring the total cost to between £5,000 and £6,000.

A New Church at Ocklynge, Eastbourne, is being erected in Willingdon Road. Mr. Granville E. S. Streatfeild is the architect. The chancel, morning chapel and vestries of the church, in which accommodation will be provided for 200 people, will be first erected; with a temporary nave to accommodate 300 to 350 persons, if sufficient money is not raised to build the permanent nave. This part of the work has been put out to tender recently, and the tender of Mr. Mark Martin for £4,184 has been accepted, this price not including the cost of the temporary nave, which would be about £350.

Isolation of the National Gallery.—In reply to questions in the House of Commons, Mr. Akers-Douglas stated that the changes which would be authorised by the passage of the National Gallery (Purchase of Adjacent Land) Bill would completely isolate the National Gallery from the buildings which are adjacent to it on the west; the nearest building will be the south-east angle of a stable, which will be 35ft. from the north-west corner of the National Gallery. With this exception, the space between the buildings will be about 40ft. The barracks adjoining the National Gallery are to be pulled down at the end of the present year.

York Minster.—The Corporation of the city of York propose to remove the quaint gateway at the College Street entrance to the minster precincts. The object is said to be to effect a street improvement and to convert the minster yard into a thoroughfare for heavy traffic to the railway station. It is contended that if the proposal be carried out it will not only disturb the peace and quiet which have so long characterised the surroundings of the venerable cathedral, but that the frequent passage of heavy traffic near the walls threatens the stability of the edifice. Important repairs have been proceeding for some years, and it is believed that other portions of the fabric are in a very insecure condition. The dean and chapter have made urgent representations on the subject.

The New Bechstein Concert Hall in Wigmore Street, adjoining the show-rooms of the well-known German pianoforte manufacturers, is oblong in form, has seats on the ground floor for 480 persons, and provision for 100 more in an end balcony facing the platform. This consists of a semicircular alcove surmounted by a cupola, which is decorated with a coloured gesso bas-relief representing Art being inspired by the Ideal, the combined work of Messrs. Moira and Lynn Jenkins. As it is not intended to give orchestral concerts the platform is only large enough for the requirements of the performers of chamber music and reciters, for whom, however, it provides ample accommodation. Mr. T. E. Collcutt, the architect, has adopted the Italian Renaissance style, and the decorations consist of Numidian and red Verona marble and alabaster, relieved by judicious gilding. The ventilation is declared to secure a supply of pure air, while obviating all draughts. The acoustical properties of the hall are most satisfactory.

Memorial to Chelsea Pensioners.—The Commissioners of the Royal Hospital at Chelse have erected a monument to the memory o the 2,625 in-pensioners who were buried i Brompton Cemetery between January, 185 and July, 1893. The monument is a granit obelisk, embellished with flags and trophies i bronze.

Mr. Kitchen has been appointed to succee Mr. P. G. Smith as architect to the Loc Government Board. Mr. Kitchen is an ab young architect. and is a son of Dean Kitche of Durham Cathedral. He married a daught of Sir Walter Foster, M.P., and was appointe assistant-architect to the Local Governme Board in 1894, when Sir Walter held the offi of Parliamentary Secretary to that Depar ment.

New Board School at Stoke Newington.—Th Princess May Road Board School, in Sto Newington Road, was formally opened last wee It has a frontage to the main road. It provid accommodation in the main building for 3 boys, 304 girls and 308 infants, and there also a separate building for deficient childre The site, with the legal expenses, has co £17,000, and the building £24,000, the tot being more than £40,000.

St. Barnabas Homes.—The west wing and t administrative block of the permanent buildin of the Homes of St. Barnabas were open recently. The part of the building now co pleted will accommodate some thirty-five clerg and it is expected that it will not be long befo all the sets of rooms are occupied. Each clerg man is provided with a bedroom and sittin room. Those who are chronic invalids a accommodated in the administrative block, whe where there are a morning-room, a smoking-roo a library, and rooms for chaplain, matron, nurs and servants. A dining-room and chapel are course of erection.

Messrs. Walter J. Pearce, Ltd., of Manchest have, for the facilitation of their London a South of England business, appointed a Lond representative in the person of Mr. Leona Laskey, who, at his office, 10, Newman Stre W., will keep a stock of sample work, glass drawings, and designs; and being persona acquainted with the technical details of t stained glass business, he will be able to d with all enquiries promptly upon the spot. M Walter J. Pearce will himself, as heretofore, in London as often as occasion requires for p sonal advice and consultation, and will at times meet architects by appointment at short notice. Messrs. Walter J. Pearce, Ltd., desire particularly emphasise the fact that the colo ing and design of every order is persona supervised by Mr. Pearce, 41, Gartside Stre Manchester.

"Law relating to Factories and Workshops New Edition.—The interest shown in the sitti of the Parliamentary Committee on the n Factories Bill, and in legislation dealing w industrial questions generally, has produc many enquiries for works relating to factor and workshops. To meet the demand authoritative literature on this subject, Mess Eyre & Spottiswoode, Government Publishe East Harding Street, E.C., announce the pu cation of a new edition of Abraham & Davi "Law relating to Factories and Workshop corrected throughout, with all the latest ru and orders, and a revised list of cases.

Nottingham Architects and Competitions.—T following memorandum has been drawn up the council of the Nottingham Architectu Society for signature by members and n members practising in the district: "We, t undersigned architects, pledge ourselves not submit plans in any competition promoted the province of the Nottingham Architectu Society, unless the conditions are those publish by the Royal Institute of British Architects. in accordance with the spirit of the same." T report states that every local member of Society except one has given this pledge, a only one outside architect has declined to si though he expresses his approval with its obj The council invite architects, on hearing o competition being mooted, to at once not the hon. secretary, so that the matter m be taken up officially by the Society or by R.I.B.A.

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e are steadily making progress towards supplying all our regular readers with the Insurance Coupons to which they are entitled free of cost under Scheme No. 1. It is impossible, however, to get directly into touch with each individual reader unless they themselves write us. There are many who have not yet done so, and who are thus depriving themselves of benefit. It is not necessary to write a long letter, a post card will do, giving full name and address and name of newsagent from whom the copy is obtained.

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New Companies.

Wallace & Davies, Ltd.

Registered June 1st to acquire the business carried on by Wallace Brothers, Ltd., at Liverpool, Birkenhead, Seacombe, Egremont, New Brighton, West Kirby, Hoylake and Tranmere, and the premises at Seacombe recently occupied by the Dee Coal Company, together with the interest of Wallace Brothers, Ltd., in the stable, No. 18, Mildred Street, Liverpool, and in the lease of the yard and buildings, No. 46, Birkett Street, Liverpool, and to carry on the business of dealers in coal, coke, firewood, briquette, building materials, iron, timber, hardware, &c. Capital £12,000 in £1 shares. The first directors are J. W. Davies, J. E. Jones and T. Jones.

Tintagel and Delabole House-Building Company, Ltd.

Registered June 4th to acquire certain freehold land in Trewarmett, Tintagel, Cornwall, to erect any houses and buildings. Capital, £3,000 in £5 shares.

Illingworth, Ingham & Co., Ltd.

Registered June 4th to acquire the business of timber importers, timber merchants and sawyers, &c., now carried on at Leeds, Manchester and Goole, all in England, and at Cincinnati, U.S.A., under the style or firm of Illingworth, Ingham & Co. Capital £200,000 in £1 shares (75,000 first preference, 75,000 second preference and 50,000 ordinary shares). The first directors are S. Ingham (chairman), W. Illingworth, H. O. Ingham and G. N. Illingworth.

Owners of Pelton Colliery, Ltd.

Registered June 4th to acquire the business of colliery proprietors carried on by the Right Hon. H. Curzon Plunket, Rear-Admiral J. H. Bainbridge, and B. J. M. Walsh, at the Pelton Colliery, Durham, and to carry on the business of manufacturers of and dealers in coke and lime, iron, brick, tile and terra-cotta merchants, &c. Capital, £300,000 in £10 shares. The first directors are the Right Hon. H. C. Plunket, Rear-Admiral J. H. Bainbridge and B. J. M. Walsh.

J. Jameson & Son, Ltd.

Registered June 6th to acquire and carry on the business of manufacturers of and dealers in firebricks, retorts, sanitary pipes, fireclay and fireclay goods now carried on by Grace P. Jameson and W. A. Jameson, at Corbridge, Northumberland, as J. Jameson & Son. Capital £14,000 in £1 shares (4,000 preference). The first directors are James A. Jameson, William H. Allan and James Todd.

Frank Crump & Co., Ltd.

Registered June 7th to commence the business of timber merchants in London and elsewhere, and to carry on the business of timber merchants, buyers and sellers of timber and wood, and the products thereof. Capital £10,000 in £1 shares. The first directors are F. Crump (managing director), W. F. Sutton and J. T. Boyes, with powers to appoint others.

Alyn Brick, Tile and Terra-Cotta Co., Ltd.

Registered June 11th to acquire any minerals, stone, clay, brick-earth, sand, silica or other substances, with or without all or part of the surface, at or near Coed Talon, Flint, or elsewhere; to acquire the business of the Gem Brick, Tile and Terra-Cotta Co. Ltd. (in liquidation); and to carry on the business of miners, brick, tile, terra-cotta and earthenware manufacturers, &c. Capital £2,000 in £1 shares. The first directors are P. Edwards, A. T. Morris, T. Smith and S. J. R. Dickson. Registered office: St. Werburgh's Chambers, Chester.

Hawton-Lane Building Co., Ltd.

Registered June 11th to acquire any lands and buildings in Nottingham or elsewhere, to develop and turn to account any land in which the company is interested, and to carry on the business of builders, contractors, brick, lime, timber and hardware merchants, farmers, financiers, &c. Capital £5,000 in £1 shares. The first directors are T. L. Nelson, C. J. E. Parker and J. G. Slater.

Haulage and Traction Co., Ltd.

Registered June 11th to acquire the business of haulier and haulage contractor now carried on by Sarah A. Crouch under the style of Neale & Co., at 20, Ryley Street, Coventry, and to carry on the business of carriers, hauliers, wharfingers, warehousemen, &c. Capital £1,000 in £1 shares. Registered office: 2, Warwick Row, Coventry.

G. H. Morton & Son, Ltd.

Registered June 12th to take over the business of decorators, painters, gilders, glass painters and stainers, dealers in paints, colours, varnishes, and decorative materials and appliances, furnishers, cabinet-makers, engineers, joiners, builders, timber merchants, ironmongers, &c., now carried on at 77 79, Bold Street, and Oldham Place, Liverpool, as G. H. Morton & Sons, and to adopt an agreement with G. H. Morton. Capital £30,000 in £1 shares (10,000 six per cent. preference). The first directors are G. H. Morton (managing director), D. Brown, W. H. Gribble and C. S. Holder.

J. Sagar & Co., Ltd.

Registered June 12th to acquire the business of woodworking machine makers, and sawmill engineers, now carried on at Canal Works, Halifax, by Joe Sagar and Donald Sagar, as J. Sagar & Co. Capital £75,000 in £1 shares. The first directors are Joe Sagar and Donald Sagar.

Inverted Incandescent Lamp Syndicate, Ltd.

Registered June 13th to adopt two agreements with J. Bridger (vendor), and an agreement with the Sunlight and Safety Co. Ltd., and to carry on the business of lamp, burner and fittings manufacturers, makers of appliances for increasing illuminating power, gas manufacturers, electricians, suppliers of gas and electricity, manufacturers of electrical accessories, &c. Capital £12,500 in £1 shares.

Liverpool Cathedral Site.—At a public meeting held on June 17th at the Liverpool Town Hall to consider a scheme for the erection of a cathedral for the diocese, the St. James's Mount site was adopted by an overwhelming majority. It was announced that the subscriptions promised now amounted to £134,868.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ASHTON-UNDER-LYNE.—For the erection of underground conveniences at St. Michael's Square and Henry Square, for the Ashton-under-Lyne Corporation. Messrs. J. H. Burton and J. A. Percival, architects, 150A Stamford Street, Ashton-under-Lyne:—

General Trades.

	St. Michael's Square.	Henry Square.	Total.
Garside, Barnes, & Co., of Stalybridge	£970	£951	£1,951
C. Evans	830	805	1,635
J. Ridyard	787	770	1,557
E. Marshall	787	764	1,551
T. Dean	760*	740*	1,500

[Rest of Ashton-under-Lyne.]

Plumber and Glazier.

	St. Michael's Square.	Henry Square.	Total.
Peter Marland	£225	£225	£450
S. J. Fearns	209	209	418
W. Knowlson...	205	205	410
G. Burrows & Co. ...	199	199	398
G. H. Coop	193*	193	386
Peter Wills	193	193*	386

[All of Ashton-under-Lyne.]
* Accepted.

BUCKERELL (DEVON).—For the erection of a house for Mr. A. M. Read. Mr. E. A. Harbottle, architect, County Chambers, Exeter. Quantities by Mr. F. E. Simpson, Heavitree, near Exeter:—

Luscombe & Son	£2,692	0
E. Harris	2,265	15
Mingo & Boon...	2,101	0
Stephens & Son, Ltd. ...	1,975	0
C. Turner	£1,923	0
W. J. Grainger	1,880	0
Nicks Bros.,* Bradninch	1,854	19

* Accepted.

CARLISLE.—For the construction of stabling and other buildings at Stores Yard, Boustead's Grassing, for the Corporation Mr. Henry C. Marks, A.M.I.C.E., city engineer and surveyor:—

T. Scott, Stanwix	£4,881	1	7
G. Black, Lorne Street...	4,794	16	3
Beaty Bros., Lamplugh Street...	4,660	0	0
W. Baty, West Walls	4,507	0	0
J. Laing, Milbourne Street	4,485	0	0
J. Beaty, Old Post Office Court	4,455	0	0
J. Hindson, Finkle Street	4,430	0	0
J. H. Reed, Edward Street...	4,369	0	0
J. & R. Bell,* Nelson Street	4,361	0	0

[Surveyor's estimate, £4,551.]
*Accepted.

CHATHAM.—For the erection of a new hand-laundry Boster's Hill, Chatham. Mr. Herbert H. Dunstall, F.S.I., architect, 9 New Road Avenue, Chatham:—

W. C. Snow, New Brompton	£1,519
G. West, Strood, Rochester	1,325
West Bros., Rochester	1,324
W. Coker, Halling, near Rochester	1,322
Corke, Rochester	1,248
Trueman & Son,* Luton Road, Chatham	1,219
H. E. Phillips, New Brompton, Chatham	1,215

* Accepted.

COLNBROOK (MIDDLESEX).—For the erection of a terrace of six cottages, in concrete, at Poyle Mills, for the Fibrous Manufacturing Company, Ltd. Messrs. Clare & Ross, A.R.I.B.A., architects, Chelmsford and London:—

Clare Bros., Stratford	£1,128
Field & Clare, Forest Gate	1,068
Lane & Son,* Colnbrook	900

(Part of materials for concrete obtained on site.)

* Accepted.

CRESSING (ESSEX).—Revised tenders for the erection of a new school building, teachers' residence, preparing and fencing in the site for the Cressing School Board. Clare & Ross, A.R.I.B.A., architects, Chelmsford and London:—

Dupont & Co., Colchester	£2,300
Smith & Son, Witham	2,225
J. Rayner, E. Hanningfield	2,200
E. West, Chelmsford	2,133
F. Johnson,* Chelmsford	2,105

* Accepted.

DENBIGH.—For the erection of new buildings in Rofft-y-Crown, Denbigh, for the County School for Boys:—

Brick.

W. Williams, St. Asaph	£3,600 0 0
Jones & Pritchard, Abergele	3,278 10 11
T. Jones, Prestatyn	3,198 0 0
Dawes Bros., Wrexham	3,133 18 4
P. Edwards, Dodleston	2,995 0 0
J. S. Roberts,* Denbigh	2,779 11 0
G. H. Marshall, West Smethwick	2,652 0 0

Stone.

Jones & Pritchard	£4,276 11 11
T. Jones	3,878 0 0
W. Williams	3,700 0 0
P. Edwards	3,584 0 0
G. H. Marshall	3,052 0 0
J. S. Roberts*	3,016 11 0

* Accepted, subject to the approval of the higher educational authorities.

EDGEWARE (MIDDLESEX).—For the erection of teachers' houses and caretaker's rooms on their premises fronting on High Street, Edgeware, for the Edgeware School Board:—

T. Almond & Son, Ponders End	£1,995 0 0
W. Bailey, Bushey Heath	1,965 0 0
Foster Bros., Suffolk Road, Norwood Junction	1,937 0 0
J. Christie, Shepherd's Bush	1,897 0 0
W. Tout, Hendon	1,893 10 0
Wilson Bros., Burrows Road, Kensal Rise	1,831 0 0
F. Dupont & Co.,* Watford	1,697 0 0
F. Hodges, Edgeware	1,655 10 7

* Accepted.

KELVEDON (ESSEX).—For the erection of pair of villas for John Fuller, Esq. Clare & Ross, A.R.I.B.A., architects, Chelmsford and London:—

F. Dupont & Co., Colchester	£1,315

(Amended tender accepted.)

LONDON, E.C.—For the erection of new factory premises in Clerkenwell Road, E.C., for Messrs. R. Lloyd & Son. Mr. C. G. Miller, architect and surveyor, 65 Chancery Lane, W.C.:—

Cubitt & Co.	£10,366
H. Wall & Co.	9,785
G. H. & A. Bywaters & Son	9,749
A. A. Webber & Co.	9,586
Kilby & Gayford	9,529
H. Richards & Co.	9,299

LONDON, N.—For the erection of electric lighting station, Tottenham Lane, Hornsey, for the Hornsey District Council:—

F. C. Minter	£16,970	Lawrence & Son	£15,999
Lole & Lightfoot	16,941	Willmott & Sons	16,990
Munday & Sons	16,658	Wilkinson Bros.	15,951
C. G. Hill	16,500	F. & E. Davey	15,495
J. Christie	16,360	Braid, Pater & Co.,* Bow Churchyard, Cheapside	13,777
Gregar & Son	16,183		

* Accepted.

LONDON, S.E.—Accepted for the erection of stabling in rear of Nos. 78, 80, and 82 Smith Street, Kennington, for Mr. C. Spalding. Mr. A. E. Mullins, architect and surveyor, 16 Church Street, Camberwell:—

Burman & Sons	£532

LONDON, S.E.—For additions and alterations to Printing Works at No. 60 East Dulwich Road, for Mr. W. Russell. Mr. A. E. Mullins, architect and surveyor, 16 Church Street, Camberwell Green:—

W. Smith	£454 5
H. Line	419 0
W. Champion*	362 15

* Accepted.

LONDON, S.E.—For the erection of a new Relief Station, Nunhead Lane, Peckham, for the Board of Guardians of the parish of St. Giles, Camberwell. Mr. A. E. Mullins, architect, 16 Church Street, Camberwell Green. Quantities by Mr. W. T. Farthing:—

Tomkins	£5,097 6 6
Wallace & Co.	4,420 0 0
Parsons	4,350 0 0
Tod & Newman	4,237 0 0
Patrick & Co.	3,999 0 0
Foster Bros.	3,960 0 0
Courteney & Fairbairn	3,959 0 0
Marsland & Son	3,935 0 0
Chessum & Sons	3,923 0 0
Tyreman	3,921 0 0
Keys	3,915 0 0
Smith & Sons	3,893 0 0
Sharpington	3,769 0 0
Holloway, H. L.	3,737 0 0
Renshaw	3,659 0 0
Gough	3,654 0 0
Balaam Bros.*	3,550 0 0
Richardson	3,519 0 0
Kent	3,420 0 0

* Accepted.

LONDON, W.—For pulling down and rebuilding "the Swan" Hotel, Hammersmith, for Mr. John Strange. Mr. C. G. Miller, architect and surveyor, 65 Chancery Lane, W.C.:—

Chamberlen Bros.	£17,400	A. A. Webber & Co.	£16,498
C. Ansell	17,171	J. Chessum & Sons	16,297
Dearing & Son	16,997	J. C. Richards & Co.	16,175
Sheffield Bros.	16,652	H. L. Holloway	15,480

MAIDSTONE.—For alterations at the workhouse schools, for the Guardians:—

Builder's Work.

R. Avard	£1,397 0	T. Elmore & Son	£1,095 0
R. Corben & Co.	1,389 0	W. H. Ottewill & Son	1,057 0
G. E. Wallis & Sons	1,346 0	Wood & Sons	1,048 0
J. R. Foord & Co.	1,339 0	E. Wilkins	1,045 0
Cox Bros.	1,249 0	G. Candler*	1,035 16
Goodwin & Jeffery	1,180 0		

Heating Apparatus.

Goodwin & Jeffery	£891 0	Cruttenden & Son	£397 0
W. H. Ottewill & Son	453 0	Haynes Bros.	365 0
R. Corben & Co.	434 0	D. Paine & Co.*	339 10
G. E. Wallis & Sons	430 0		

* Accepted.

NOTTINGHAM.—For the erection of a warehouse, for Mr C. W. Gouthorpe, on London Road, Nottingham. Mr. W. Dymock Pratt, architect, Cauldon Chambers, Long Row, Nottingham. Quantities by the architect:—

T. Cuthbert, Hyson Green	£3,434
E. Hind, Pease Hill Rise	3,356
A. B. Clarke, Wright Street	3,300
Cooper & Son, Ltd., Ayr Street	3,285
J. Hutchison & Son, Gordon Road	3,230
A. E. Smith, Waterway Street	3,215
H. Green & Sons, Waterway Street	3,192
W. Maule, Mansfield Road	3,170
J. Wright, Wilford Grove	3,125
J. Lewin, Netherfield	3,109
G. T. Lovett, West Bridgeford	3,070
J. G. Thomas, Lenton Boulevard	3,057

NOTTINGHAM.—For the erection of warehouse, London Road, Nottingham, for Mr. W. H. Whiles. Mr. W. Dymock Pratt, architect, Long Row, Nottingham. Quantities by the architect:—

T. Cuthbert	£2,100
E. Hind	2,073
F. Messom, Bangor Street, Nottingham	2,028
H. Green & Sons	2,026
Dennett & Ingle, Station Street, Nottingham	2,025
J. Wright	2,010
W. Appleby, Lenton Boulevard, Nottingham	2,005
W. Maule	1,975
A. B. Clarke	1,950
J. G. Thomas*	1,932

* Accepted.

PAIGNTON (DEVON).—For the execution of the following works in connection with their New Moorland water supply: the construction of an impounding water supply, valve tower with outlet and compensation waterworks, filters, caretaker's residence, valves, castings, &c. at Holne, Devon, for the Urban District Council. Mr. Frederick William Vanstone, engineer, "Pala Chambers, Paignton:—

Contract No. 1.

W. C. Shaddock, Brightirion, Plymouth	£61,475 0 0
Pethick Bros., Laira Bridge, Plymouth	48,240 0 0
Skinner, Exeter Street, Plymouth	43,705 6 0
A. Wells & Sons, Spring Gardens, Bath	39,000 0 0
Dart & Pollard, Paignton	32,341 0 0
J. Dickson, The Grange, Dunsford, near Exeter	29,076 7 10
Hawking & Best, Teignmouth	27,853 0 0
G. Bell,* 29 Corporation Street, Manchester, and Tottenham	26,969 14 9
C. P. Brealy, 58 Cowick Street, St. Thomas's, Exeter	20,708 0 0

* Accepted.

PAIGNTON.—For the erection of a New Retort House and Co Store for the Paignton Gas Company. Mr. C. G. Dawso Engineer, Paignton. Quantities by Mr. Vincent Cattermo Brown of Paignton.

G. Webber	£1,089 0	C. & R. E. Drew	£1,036
H. Webber & Sons	1,078 10	Dart & Pollard	928
E. Westlake	1,049 0	Herbert Drew*	884

[All of Paignton.]

* Accepted.

PONTARDAWE (WALES).—For the construction of sewe manholes, lampholes, flushing tanks, overflow chambers, cover tanks, filters, distributing carriers, drains, and works in connecti therewith at Pontardawe, for the Pontardawe Rural Distri Council. Mr. J. Morgan, engineer, Herbert Chambers, Ponta dawe:—

Barnes, Chaplin, & Co., Cardiff	£7,470
E. H. Page, Cardiff	6,859
J. Williams,* Brynmor Crescent, Swansea	6,851

* Accepted.

TREDEGAR (MON.).—For the erection of a class-room a certain other work at the Pontygof Girls' School, for the Be wellty School Board:—

S. Arrowsmith, Tredegar	£1,165 5
J. Morgan, Blaenavon	1,148 0
W. Davies, Beaufort	1,072 0
J. Newcombe, Ebbw Vale	1,012 0

WEST HAM.—For the construction of the following, for tl West Ham Town Council:—underground sanitary convenience Maryland Point; sanitary conveniences, Beckton Road Recreatic Ground: sanitary conveniences, Hermit Road Recreation Groun Mr. J. G. Morley, borough engineer:—

Maryland Point.

A. E. Symes	£2,761 0 0
Doulton & Co.	2,550 0 0
Works Manager	2,485 2 8
Foster Bros.	2,383 0 0
Gregar & Son	2,134 0 0
Finch & Co., Ltd.	2,131 0 0
C. North	2,052 5 0
G. Jennings*	2,050 0 0

Becton Road Recreation Ground.

Doulton & Co.	1,200 0 0
Works Manager	1,137 12 7
Davis & Bennett	1,[illegible] 0 0
Foster Bros.	1,020 0 0
Finch & Co., Ltd.	974 0 0
C. North	963 5 0
Gregar & Son*	894 0 0

Hermit Road Recreation Ground.

Doulton & Co.	520 0 0
Works Manager	473 15 0
Davis & Bennett	460 0 0
Foster Bros.	436 0 0
C. North	412 16 0
Finch & Co., Ltd.	399 0 0
Gregar & Son*	399 0 0

* Accepted.

WIVENHOE (ESSEX).—For supply and delivery at Wivenh of about 240 tons of cast-iron water-pipes and specials, 6-in., 5-in 4-in., and 3-in. diameter, and cast-iron water-tank (to hold abou 50,000 gallons), and other works, and for the carting, excavatin for, and laying and jointing of about 4½ miles of 6-in., 5-in., an 4-in. cast-iron water-mains, including fixing valves, hydrants, &c. erection of brick water-tower and the fixing of cast-iron wate tank thereon, also erection of pumping station and all works i relation thereto, for the Wivenhoe Urban District Counci Messrs. Sands & Walker, engineers, Angel Road, Nottingham:—

Gill & West, Southend	£8,200 0 0
S. Saunders, Earl's Court Square, London	8,018 0 0
G. Grimwood, Ipswich	6,993 0 0
D. Mackenzie & Sons, Station Works, Clacton-on-Sea	6,499 5 6
H. Shardlow,* Hyson Green, Nottingham	6,282 4 6

* Accepted.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
June	28	Elgin—Residence	—	R. B. Pratt, Town and County Bank Buildings, Elgin.
„	28	Houghton-le-Spring—Restoration	—	J. Bendelow, 16 Nesham Place, Houghton-le-Spring.
„	28	Kilmacrean—Additions	Neil Coyle, J.P.	J. McIntyre, Architect, Letterkenny.
„	28	Wolverhampton—Alterations	School Board	J. H. Fleeming, 102 Darlington Street, Wolverhampton.
„	28	Port Talbot—Works, &c.	English Celluloid Company	F. B. Smith, Architect, Port Talbot.
„	29	Bardon Mill Bridge, Northumberland—Bdge. Widening	Northumberland County Council	J. A. Bean, Moot Hall, Newcastle.
„	29	Halifax—Houses	—	Mr. M. Hall, Architect, Halifax.
„	29	Willenhall—Bridge	Urban District Council	T. E. Fellows, Engineer, Town Hall, Willenhall.
„	29	Wrotham, Kent—Dwellings	Urban District Council	J. Sharp, 5 Sunnyside, Borough Green.
„	29	Aberystwyth—Villas	—	G. Jones & Sons, 17 George Street, Aberystwyth.
„	29	Beverley—School	—	Botterill, Son & Bilson, 23 Parliament Street, Hull.
„	29	Braithwaite (Yorks)—School	Kirk Bramwith School Board	F. Allen, Bank Chambers, Doncaster.
„	29	Clonakilty (Ireland)—Business Premises	—	Miss H. O'Brien, 16 Mill Street, Clonakilty.
„	29	Keighley—School	—	Moore & Crabtree, York Chambers, Keighley.
„	29	Llanhilleth (Wales)—Renovating	—	David Davies, 3 Brookland Terrace, Llanhilleth.
„	29	Swansea—Market	Harbour Trustees	A. O. Schenk, Harbour Offices, Swansea.
„	29	Swansea—Pumping Station	Harbour Trustees	A. O. Schenk, Harbour Offices, Swansea.
„	30	Knockbeg College, Carlow—New Building	Most Rev. P. Foley, D.D.	Moore & Aylward, 184 Gt. Brunswick Street, Dublin.
July	1	Morley—Houses	J. Mitchell	T. A. Butterley & J. B. Birds, Queen Street, Morley.
„	1	Stokenham—Cottage	A. F. Holdsworth	W. Perring, Widewell, Torcross.
„	2	Croydon—Sewer Culverts	Town Council	Deputy Borough Engineer, Town Hall, Croydon.
„	2	Kingston-on-Thames—Laundry	Guardians	G. E. Hope, Architect, Hampton Wick.
„	2	Tyldesley—Technical School	Urban District Council	J. Holt, 6 St. Mary's Gate, Manchester.
„	2	Aldershot—Buildings, Shaft, &c.	Urban District Council	N. F. Dennis, Council's Surveyor, Aldershot.
„	3	Chatham—Lavatory, &c.	Medway Union Guardians	G. E. Bond, Architect, Pier Chambers, Chatham.
„	3	Hucknall Huthwaite, Notts—Schools	School Board	J. E. Goodacre, 4 Stockwell Gate, Mansfield.
„	3	Tipton—Renovation of Schools	School Board	E. Richards, Clerk, Owen Street, Tipton.
„	4	Stockport—Retaining Wall	General Purposes Committee	J. Atkinson, Borough Surveyor, St. Peter's Gate, Stockport.
„	4	Haywards Heath, Sussex—Offices, &c.	Cuckfield Rural District Council	A. R. Pannett, Architect, Haywards Heath.
„	5	Whitenose, Dorset—Coastguard Buildings	Admiralty	Director of Works Department, 21 Northumberland Avenue, W.C.
„	5	Huntingdon—Alterations	Guardians	E. Borissow, 151 High Street, Huntingdon.
„	8	Leeds—Police Station	Watch Committee	Bedford & Kitson, Greek Street Chambers, Leeds.
„	8	Llanberis, N. Wales—Church House	—	The Rector, St. Padarn's Church, Llanberis.
„	8	Abergavenny—Stone-arched Bridge, &c.	Rural District Council	J. Gill, 4 Brecon Road, Abergavenny.
„	8	Bridgwater—Alterations, &c. to School	Governors	Samson & Cottam, Architects, Bridgwater.
„	9	Cork—Alterations, &c. to Schools	Lunatic Asylum Committee	H. A. Cut[illegible], City Engineer, Municipal Buildings, Cork.
„	9	West Ham—Fire Brigade Station, &c.	Town Council	Borough [illegible]gineer, Town Hall, West Ham.
„	15	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor [illegible]own Hall, Paddington, W.
„	17	Leeds—Hospital Extension	Sanitary Committee	E. T. He[illegible]54 Bedford Square, W.C.
„	21	Kenchester, Hereford—Widening Culvert	Rural District Council	T. Llan[illegible]ne, 6 St. John Street, Hereford.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ENGINEERING:		
June	28	Hurst, Lancs—Tramways	Urban District Council	E. Garside, Town Hall Chambers, Ashton-under-Lyne.
,,	28	Port Talbot—Railway	English Celluloid Company	F. B. Smith, Architect, Port Talbot.
,,	28	Darvel, Ayrshire, N.B.—Water Supply Works	Burgh Councillors	P. C. Hart, 32 John Finnie Street, Kilmarnock.
,,	28	Brewood, Staffs—Heating Church	Vicar	Rev. C. Dunkley, The Vicarage, Brewood.
,,	29	Portaskaig, Sound of Islay—Repairs, &c. of Pier	—	J. Laughton, Factor, Ellabus, Bridgend, Islay.
,,	30	Nelson, Lancs—Conveyor Belt at Sewage Works	Sewage and Street Committee	B. Ball, Borough Engineer, Town Hall, Nelson.
July	1	London, S.E.—Electricity Meters, &c.	Bermondsey Borough Council	F. Ryall, Town Clerk, Town Hall, Spa Road, Bermondsey.
,,	1	Nelson. Lancs—Electrical Plant	Corporation	W. A. Fraser, Borough Electrical Engineer, Town Hall, Nelson.
,,	1	Edinburgh—Laundry Machinery, &c.	—	Public Works Office, City Chambers, Edinburgh.
,,	1	Cork—Piers, &c.	County Council	J. G. M'Carthy, Secretary, Court House, Cork.
,,	2	London, E.—Electric Mains Extensions	Electricity Committee	Borough Electrical Engineer, Electricity Works, Glaucus Street.
,,	2	Edinburgh—Extension of Promenade	Magistrates and Council	Burgh Engineer, City Chambers, Edinburgh.
,,	2	Worcester—Piling along River	Corporation	T. Caink, City Engineer, Guildhall, Worcester.
,,	2	Monaco—Jetty or Pier	Government	Commercial Department, Foreign Office, S.W.
,,	2	Westbourne Park. London—Widening Bridge, &c.	Great Western Railway	Engineer's Office, Paddington Station, W.
,,	3	Halfway Street, near Sidcup—Well, &c.	Greenwich Union Guardians	T. Dinwiddy, Architect, Croom's Hill, Greenwich.
,,	3	Seaford, Sussex—Extension of Sewage Outfall	Urban District Council	B. A. Miller, 3 Clinton Place, Seaford.
,,	3	Newcastle-on-Tyne—Diversion of Railway, &c.	North Eastern Railway Company	C. A. Harrison, Central Station, Newcastle-on-Tyne.
,,	4	London, N.E.—Mechanical Coaling Apparatus	Hackney Borough Council	R. Hammond, 64 Victoria Street, S.W.
,,	6	Lindfield—Bridge	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
,,	6	Chepstow—Repairing Bridge, &c.	Rural District Council	J. W. Stanton, Clerk to Highways Committee, Welsh St., Chepstow.
,,	6	Cockermouth—Heating Apparatus	—	J. Huddart, Crown Street, Cockermouth.
,,	6	Freshfield, Sussex—Bridge	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
,,	8	Chester—Sewage Works	Corporation	City Engineer, Town Hall, Chester.
,,	8	Hanwell—Repairing Fire Engine, &c.	Urban District Council	W. S. Barnes, Surveyor, Council Offices, Hanwell, W.
,,	8	Douglas, Lanarkshire—Railway	Caledonian Railway Company	Company's Engineer, Buchanan Street Station, Glasgow.
,,	8	Edinburgh—Railway Tank Waggons	Gas Commissioners	W. R. Herring, Manager, New Street Works, Edinburgh.
,,	9	Barnes—Refuse Destructor	Urban District Council	G. B. Tomes, Engineer, Council Offices, High St., Mortlake, S.W.
,,	12	Mansfield—Electrical Plant	Corporation	R. Hammond, 64 Victoria Street, S.W.
,,	13	Chorley, Lancs—Pumping Station	Rural District Council	A. Jolly, 9 High Street, Chorley.
,,	15	London, E.C.—Ten Locomotives	Bengal-Nagpur Railway Co., Ltd.	Sir J. Wolfe Barry, 21 Delahay Street, Westminster.
,,	16	Birkenhead—Electric Tramcar Bodies, &c.	Corporation	A. R. Fearnley, Manager, Sessions House, Brandon St., Birkenhead.
,,	18	Egremont, Cheshire—Machinery and Tools	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
Aug.	1	Manila—Harbour	—	Commercial Department, Foreign Office, Manila.
,,	16	Jassy—Supply of Water to Town	Communal Council	Communal Technical Department, Jassy.
Dec.	10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.
		IRON AND STEEL:		
June	28	Lancaster—Iron Fencing	Rural District Council	J. Ennion, 5 Dalton Square, Lancaster.
,,	28	Nottingham—C.I. Sluice Valves, Pipes, &c.	Water Committee	S. Moore, Water Manager, St. Peter's Churchside, Nottingham.
July	1	Calcutta—Bins	Corporation	Chairman of Corporation, Calcutta.
,,	3	Millom, Cumberland—Pipes	Urban District Council	Surveyor, Council Offices, Millom.
,,	8	Perth—C.I. Pipes, &c.	County Council	Thomson & Wright, 22 Rutland Square, Edinburgh.
,,	31	Sydney, N.S.W.—Rails	—	Agent-General for N.S.W., 9 Victoria Street, Westminster, S.W.
		PAINTING AND PLUMBING:		
June	28	Wolverhampton—Painting Schools	School Board	T. H. Fleeming, 102 Darlington Street, Wolverhampton.
,,	28	Nottingham—Lead Piping, &c.	Water Committee	S. Moore, Water Manager, St. Peter's Churchside, Nottingham.
July	1	Edinburgh—Painting	Parish Council	A. Ferrier, Clerk, Council Chambers, Edinburgh.
,,	1	Halifax—Painting School	School Board	W. H. Ostler, 22 Union Street, Halifax.
,,	1	Jarrow—Painting, &c. Schools	School Board	H. M. Adam, Grange Schools, Jarrow.
,,	1	Whitwood Mere, Castleford—Colour Washing, &c.	School Board	J. Redpath, 72 Methley Road, Whitwood Mere.
,,	1	London, E.—Painting, &c. at Infirmary	Mile End Guardians	W. Thacker, Clerk, Guardian's Offices, Bancroft Road, E.
,,	3	Sheffield—Painting, &c. Schools	School Board	J. F. Moss, School Board Offices, Sheffield.
,,	6	Cockermouth—Painting, Varnishing, &c.	Congregational Church Managers	J. Huddart, Crown Street, Cockermouth.
,,	9	Rawmarsh—Painting, &c. Schools	School Board	E. Corbridge, 22 Dale Road, Rawmarsh.
Aug.	5	Cleckheaton—Interior Renovation of Church	—	Wesleyan Church, Whitcliffe Road, Cleckheaton.
		ROADS AND CARTAGE:		
June	28	Branksome, Dorset—Granite	Urban District Council	S. J. Newman, 3 Tennyson Bdgs., Ashley Rd., Branksome, Parkstone.
,,	29	Ashton-in-Makerfield—Kerbs, Flags, &c.	Urban District Council	J.W. Liversedge, Srvyr., Cncl. Offics., Byron St., Ashton-in-Makerfield.
,,	29	Walton-on-Thames—Water Van	Urban District Council	C. J. Jenkin, Engineer, Council Offices, Walton-on-Thames.
,,	29	Littlehampton—Materials	Urban District Council	A. Shelley, Clerk, Town Offices, Littlehampton.
,,	29	Luton—Stones	Rural District Council	B. B. Franklin, 21 Market Hill, Luton.
July	1	London, S.E.—Six Slop Vans and two Material Carts	Bermondsey Borough Council	R. J. Angel, Borough Surveyor, Town Hall, Spa Road, S.E.
,,	2	Aldershot—Works	Urban District Council	N. F. Dennis, Council's Surveyor, Aldershot.
,,	2	London, N.—Making up, &c.	Tottenham Urban District Council	W. H. Prescott, 712 High Road, Tottenham, N.
,,	2	Lydney—Road, &c.	West Dean Rural District Council	D. J. Beatson, Crown Offices, Whitemead Park, Parkend, near Coleford, Glos.
,,	3	Hove—Roadmaking	Corporation	H. H. Scott, Borough Surveyor, Town Hall, Hove.
,,	5	Wanstead, Essex—Granite	Urban District Council	W. Blewitt, Clerk, Council Offices, Wanstead, N.E.
,,	9	Rowmarsh—Asphalting	School Board	J. Platts, Architect, High Street, Rotherham.
		SANITARY:		
June	28	Glasgow—Drains	Lunacy District Board	J. R. Motion, 38 Cochrane Street, Glasgow.
,,	29	Nottingham—Drain Tiles	Stoke Farm Committee	A. Brown, City Engineer, Nottingham.
,,	29	Warminster—Sewers	Urban District Council	A. F. Long, Town Engineer, Council Offices, Warminster.
July	1	Hemel Hempstead—Sewerage Works	Rural District Council	W. H. Radford, Albion Chambers, King Street, Nottingham.
,,	1	London, W.—Limes, Cements, Pipes, &c.	Ealing Urban District Council	C. Jones, Public Buildings, Ealing, W.
,,	1	Sheffield—Lime	United Gaslight Co.	H. Thomas, General Manager, Commercial Street, Sheffield.
,,	1	Glemsford, Suffolk—Sewer, &c.	Urban District Council	Surveyor, Council Offices, Glemsford.
,,	1	Monmouth—Sewage Disposal Works	Corporation	Conifers, Kirkby & Son, Stow Chambers, Skinner St., Nwport, Mon.
,,	2	Enniskillen—Sewerage System	Rural District Council	R. Wilson, Clerk, Workhouse, Enniskillen.
,,	3	Erdington, near Birmingham—Sewerage Works	Urban District Council	H. H. Humphries, Surveyor, Public Hall, Erdington, Birmingham.
,,	3	Millom—Extension of Sewer	Urban District Council	W. T. Lawrence, Clerk, Council Offices, Millom.
,,	4	Shifnal, Salop—Sewerage Works	Rural District Council	R. E. W. Berrington, Engineer, Bank Buildings, Wolverhampton.
,,	5	Tadcaster—Sewerage Works	Rural District Council	W. Spinks, 20 Park Row, Leeds.
,,	6	Moffat, Scotland—Sewerage Works	Town Council	Niven & Haddin, 131 West Regent Street, Glasgow.
,,	11	Ware, Herts—Sewer, &c.	Urban District Council	J. E. Smales, Surveyor, New Road, Ware.
,,	13	Wheatley, Oxon—Sewers, &c.	Urban District Council	G. Whinship, 21 St. Michael's Street, Oxford.
,,	24	Lyme Regis, Dorset—Sewers	Town Council	M. C. Preston, Town Clerk, Lyme Regis.
		TIMBER:		
July	2	Aldershot—Pale and Space Fencing	Urban District Council	N. F. Dennis, Council's Surveyor, Aldershot.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
June	30	Hereford—Municipal Buildings	£100, £75, £50	J. Carless, Offa Street, Hereford.
July	31	Manchester—Fire Station and Police Station	£300, £200 and £100	W. H. Talbot, Town Hall, Manchester.
Aug.	1	Egremont, Cumbrld.—Alteration of Property in Main St.	—	J. Lowery, 59 Main Street, Egremont.
Oct.	1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 9 0	—
Clover, best	per load	4 5 0	5 2 6
Hay, best	do.	4 7 0	4 17 6
Sainfoin mixture ..	do.	3 15 0	4 12 6
Straw	do.	1 8 0	1 16 0

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ..	per cwt.	1 8 0	1 8 7
Colza Oil, English ..	do.	1 7 6	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 4 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do.	1 0 4½	—
Linseed Oil, barrels ..	do.	1 12 0	—
Petroleum, American ..	per gal.	0 0 5¾	0 0 5⅞
Do. Russian ..	do.	0 0 4⅞	0 0 5
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	3 0 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 4 6	1 5 3
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	1 7 4½	—

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ..	per ton	85 0 0	—
Iron, Staffs., bar ..	do.	6 2 6	8 10 0
Do. Galvanised Corrugated sheet ..	do.	11 10 0	11 15 0
Lead, pig, Spanish ..	per ton	12 8 9	12 10 0
Do. do. English common brands	do.	12 17 6	—
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17 9 0	—
Do. pipe	do.	18 3 0	—
Nails, cut clasp, 3in. to 6in.	do.	12 0 0	13 0 0
Do. floor brads	do.	11 15 0	12 15 0
Steel, Staffs., Girders and Angles	do.	6 0 0	6 5 0
Do. Mild Bars	do.	7 0 0	7 10 0
Tin, Foreign	do.	129 15 0	130 5 0
Tin, English ingots ..	do.	131 10 0	—
Zinc, sheets, Silesian ..	do.	22 0 0	—
Do. do. Vieille Montaigne	do.	22 10 0	—
Do. Spelter	do.	17 5 0	17 15 0

TIMBER.

Soft Woods.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel ..	per load	3 0 0	4 0 0
Pine, Quebec Yellow ..	do.	4 7 6	6 0 0
Pine, Pitch	per load	2 9 0	3 0 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 0
Do. Petersburg ..	per bundle	0 0 9	0 0 10½
Deals, Archangel 2nd & 1st	per P.Std.	8 5 0	11 15 0
Do. do. 4th & 3rd	do.	8 0 0	—
Do. do. unsorted	do.	—	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	21 0 0	—
Do. do. 2nd "	do.	19 0 0	—
Do. do. unsorted	do.	11 0 0	—
Do. do. White	do.	9 10 0	11 5 0
Do. Swedish	do.	9 10 0	18 0 0
Do. White Sea ..	do.	9 15 0	13 0 0
Do. Quebec Pine, 1st ..	do.	22 0 0	23 0 0
Do. do. 2nd ..	do.	19 15 0	—
Do. do. 3rd &c.	do.	13 10 0	—
Do. Canadian Spruce, 1st	do.	12 5 0	—
Do. do. 3rd & 2nd	do.	9 5 0	10 0 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds ..	do.	6 0 0	9 0 0
Flooring Boards, 1in. prepared, 1st ..	per square	0 11 6	0 13 6
Do. 2nd ..	do.	0 9 6	—
Do. 3rd &c. ..	do.	0 6 9	0 7 3

Hard Woods.

		£ s. d.	£ s. d.
Ash, Quebec	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba ..	per ft. sup.	0 0 4 5/32	—
Do. Honduras ..	do.	0 0 3 21/32	—
Do. Tobasco	do.	0 0 4	—
Elm, Quebec	per load	0 12 6	5 10 0

COMING EVENTS.

Wednesday, June 26.

National Trust for Places of Historic Interest or Natural Beauty.—Annual Meeting at the Royal United Service Institution at 4 p.m.

Thursday, June 27.

Society for the Promotion of Hellenic Studies.—Annual Meeting at 5 p.m.

Friday, June 28.

Physical Society.—Meeting at 5 p.m.

Ruskin Union.—Lord Avebury on "The History of Coins and Money," Whitelands Cottage, Chelsea. 8.30 p.m.

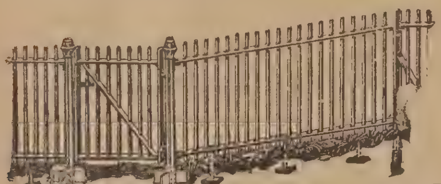
Society of Arts.—Conversazione at the Royal Botanic Garden, Regent's Park.

Saturday, June 29.

Architectural Association.—Second Summer Visit to Colney Chapel Convent, St. Albans, by invitation of Mr. Leonard Stokes.

Saturday, July 13.

Architectural Association.—Third Summer Visit to Medmenham Abbey, &c., and "Danesfield," both at Great Marlow, by permission of the Architect, Mr. W. H. Romaine-Walker.



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Is, we believe, the cheapest in the market.

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FLOORING BLOCKS.

Per 100 Blocks out of sizes.	YELLOW		PITCH PINE
	At Wharf.	ex Ship within one month.	At Wharf.
17¼ × 3 × 3	13 8	12 9	17 6
17¼ × 3 × 2	8 11	8 2	12 6
17¼ × 3 × 1½	6 10	6 3	9 6

PRIME DRY OAK & PITCH PINE FLOORING,

With Special Joint to conceal Nails—

1¼ × 4½ Oak, 56/9 Pitch Pine, 26/9 per square
1 × 4½ " 45/6 " 22/6

These prices include desiccation.

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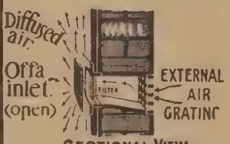
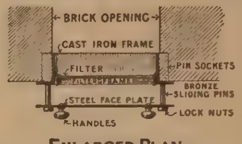


SECTIONAL VIEW.



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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

July 3, 1901.
No. CCCXXXIV.

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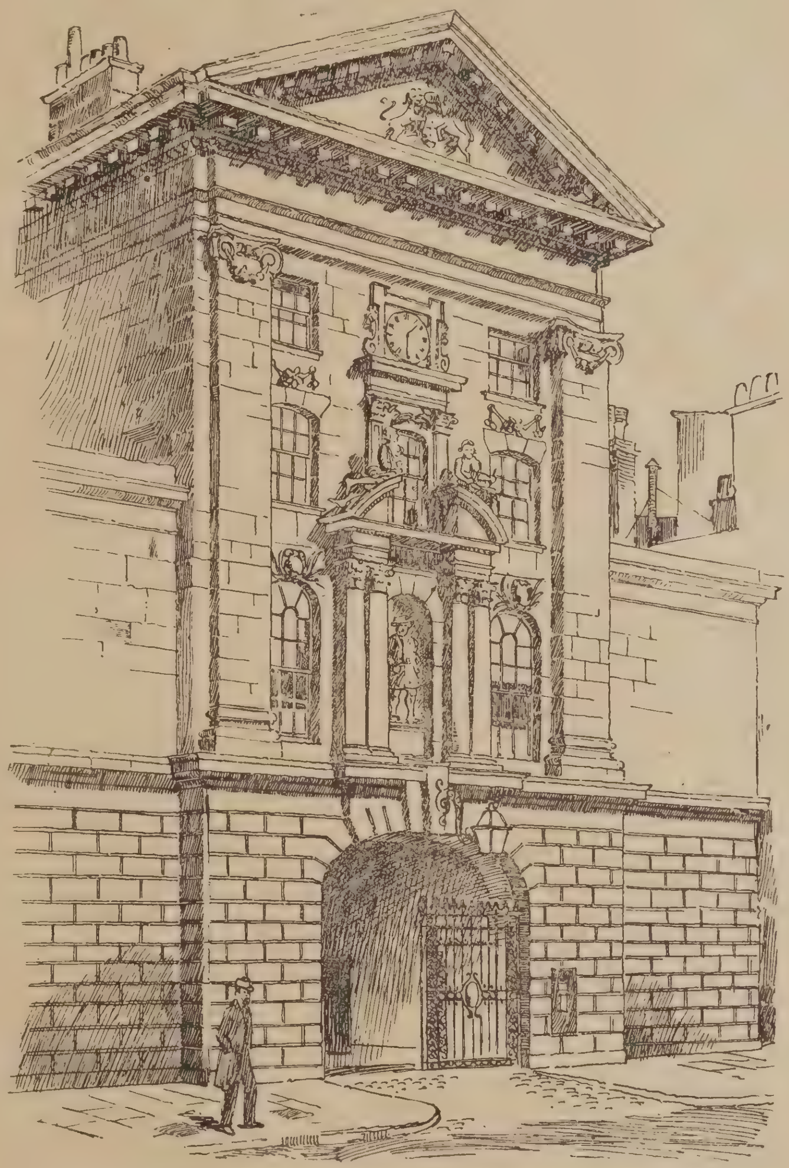
An Architectural Causerie.

The National Trust. We think that Mr. Bryce, M.P., said the right thing at last week's meeting of the National Trust for Places of Historic Interest or Natural Beauty when he remarked that "what they had got to do through the Trust was, above all, to form public opinion, and the best way in which they could form public opinion was by stimulating it locally." This is attempting to get to the root of things, and consequently it has the greatest chance of success. Public opinion is generally dominated or created by one man or a particular body of men, the great majority of people, unfortunately, possessing few opinions based on their own experience; so that the object is to try to impress upon the public at large that every old building is not to be demolished or a charming landscape marred because someone wants to make capital out of the site. Moreover, what is needed is deliberate action—public opinion, though hostile to a proposed spoliation, may be too loose and indefinite to have effect : and, therefore, when a society like this Trust attempts, as it has done, to preserve Stonehenge, or to acquire the Brandlehow Park estate on Derwentwater, its efforts deserve every support. (A sum of £7,000 is required for the purchase of the Derwentwater estate, of which £2,975 has been subscribed.) They did not make much progress last year, one reason being that the acquisition of real property is always a slow affair, but still they have done good work in influencing public opinion against the evil inroads of commercialism, of which we stand in such danger at the present day.

Gateway, St. Bartholomew's Hospital. This interesting portion of St. Bartholomew's Hospital forms the entrance gateway to the quad and was built by Wren, in 1702, to replace a building erected in 1546, when the hospital was refounded by Henry VIII. The original foundation was in 1102, by Rayhere, at the same time as he built St. Bartholomew's Church, on his return from a pilgrimage to Palestine.



GATEWAY OF ST. BARTHOLOMEW'S HOSPITAL. DRAWN BY H. T. REES.

The Laying-out of Estates. Much as the artistic outsider may deplore the laying-out of a familiar and secluded estate—maybe with its century-old mansion hidden among the trees—it is impossible to expect anything different as the result of city growth. But he may very justly demand that such estates should not be made into wildernesses of bricks and mortar, with villas huddled together as close as the by-laws will allow. We have a great grievance against the man who does this; the man who divides up the land into mean little plots, all—or almost all—of exactly the same size and shape. Such monotonous uniformity could only emanate from a mind of small calibre; and when on these tiny patches arise correspondingly meagre houses built (so to speak) at so much a dozen, the evil is consummated. Some abut on the pavement, while others rejoice in a strip of ground insufficient for a chicken-run. At the back is another speck of green which, because of its area, is naturally divided up by paths, with perhaps a circular flower-bed in the centre. With such methods in vogue, can one hope for anything else than what villadom now stands for? And yet there is much opportunity for improvement—which, one is glad to say, is being more extensively appreciated. It consists in varying the disposition of the plots and in allowing a reasonable air-space between each house, at the same time covering the whole available garden space with grass, perhaps with the exception of a narrow bed around the sides. An estate laid out after this manner can be made to look very pleasing. It is impossible to over-estimate the value of grass and trees as adjuncts to dwelling-houses; and though it is, of course, only possible to have comparatively little green in the area of a city, yet every effort should be made to secure that little · otherwise we shall most certainly deserve the title of a "street-born people."

Cape Town War Memorial. St. George's Cathedral, Cape Town, was the first important building erected in the Colony under the second occupation of the British, when Sir Lowry Cole was head of the Government. It is of Classic design, but is equally uninteresting as the Supreme Court Buildings or the now demolished Exchange. It is proposed to add to it transepts and an eastern end as a memorial to those who have fought and died in the South African War, a proposal which has the support of the King and Lord Roberts. Considering the animosities which have necessarily arisen over the war, one cannot but admire the reason which dictates that the memorial shall not take the form of one of victory over a conquered foe; but it is unfortunate that so inferior a building as St. George's Cathedral should be chosen as the subject of additions, which, whatever they may be, can never look harmonious, and must either form an uninteresting appendage to an uninteresting building, or be spoiled by the latter.

SOME SKETCHES OF DERBYSHIRE WORK.

By J. TARNEY.

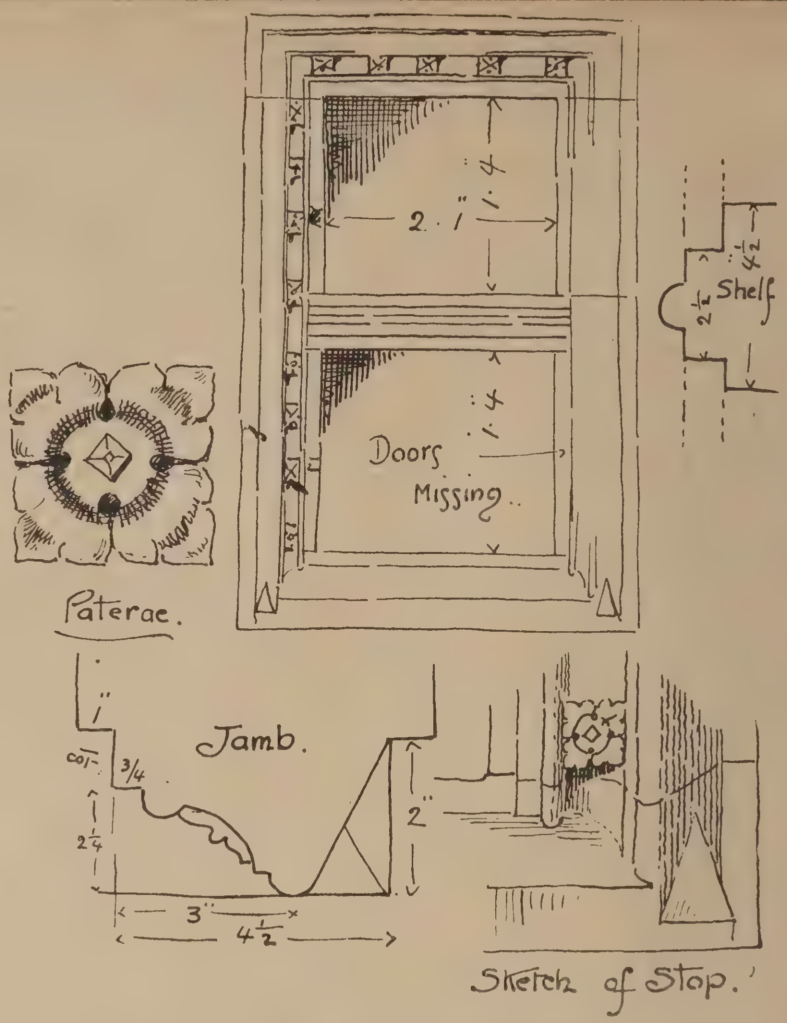
THE churches of Breadsall and Morley are both within four miles of Derby, and are exceedingly interesting. The former church is principally in the Transitional Early English to Decorated style, though it contains examples of late Norman, Early English and Decorated work, with a fine tower and spire. Near the church stands what was formerly the old Hall, of stone and half-timber, now converted to the use of the village post-office.

Morley is a small church with a Norman nave and a Decorated chancel, tower and spire, and aisles. In the latter are incorporated windows and a porch said to have been brought from Dale Abbey, which place also furnished much of the old glass and many of the floor tiles in which this church is particularly rich. There are also nine brasses to members of the Statum family, the builders of the chancel and tower, various stone effigies and monuments, four piscinæ and other details of interest. The church is very well kept.

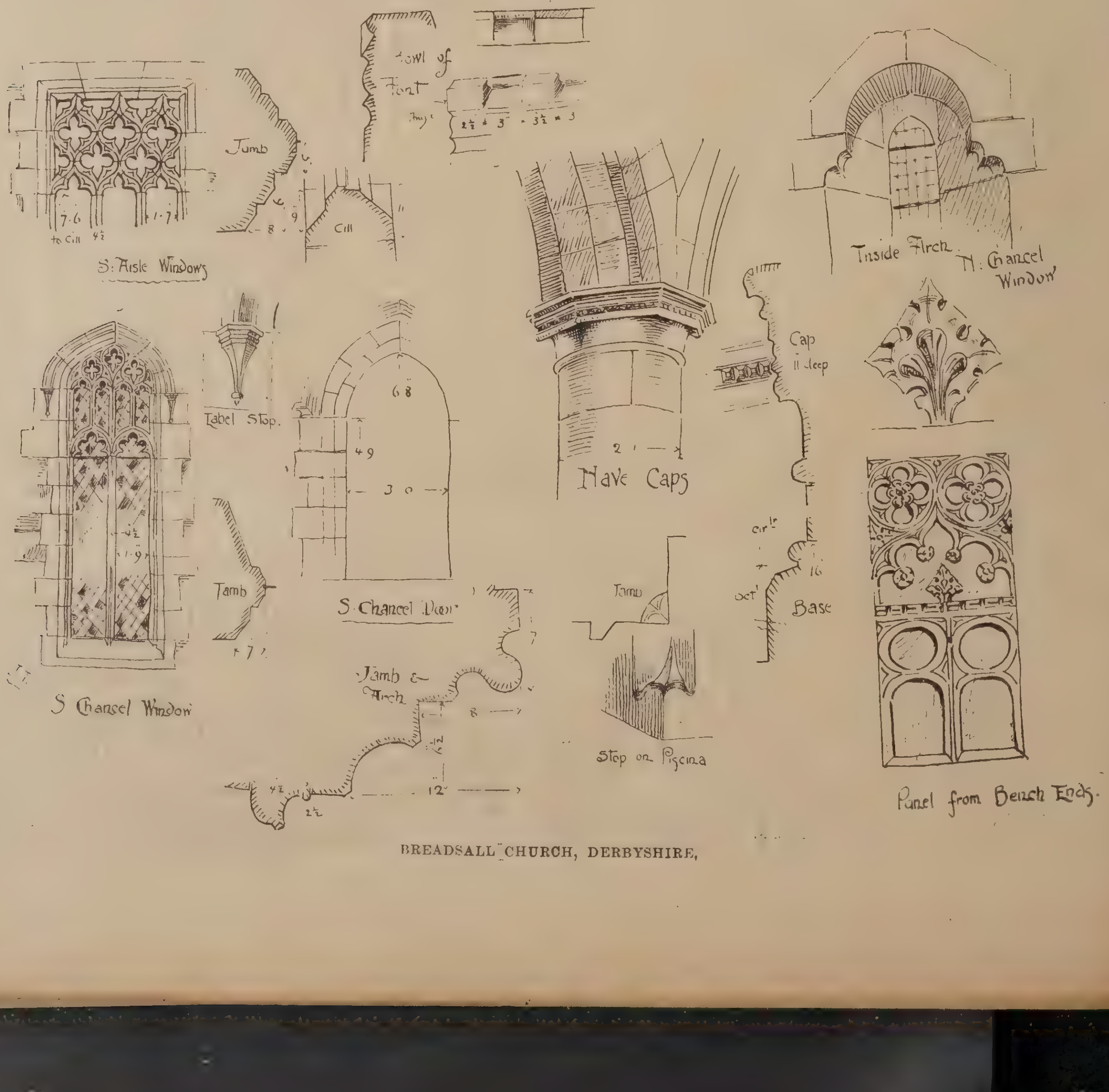
Tutbury is situated on the borders of Staffordshire and Derbyshire. The ruins of the ancient castle are very picturesquely situated on the wooded summit of the hill above the river Dove, the principal remains being a gateway and portions of the front built by John O'Gaunt, wherein Mary Queen of Scots was imprisoned.

The church, just under the castle walls, is mainly of Norman work, and rejoices in the possession of one of the finest and largest west doorways in the country, in this style; it is in a very good state of preservation. The Decorated windows illustrated are in the south aisle.

Melbourne Church, about nine miles south of Derby, is a perfect example of a cruciform church, and has the rare distinction of being almost all in the same style—the Norman. It has a central tower and two smaller west towers flanking a portico. The interior effect with the massive pillars, 4ft. in diameter, and fine stilted arches, is very impressive, especially looking



AUMBRY, BAKEWELL CHURCH.



BREADSALL CHURCH, DERBYSHIRE.

across the crossing under the tower with its triforium. Near the church is the Hall, with gardens in the Dutch style.

Rowsley, like Bakewell, is the most convenient place from which to visit Haddon Hall and Chatsworth. In the village is the many-gabled and noted "Peacock Inn"—a favourite resort of anglers—and many picturesque cottages built in the same substantial style.

SITE VALUES.

Report of the Local Taxation Commission.

THE Local Taxation Commission's report on the rating of site values marks a new stage in the long, and so far inconclusive, controversy that has centred round this question.

Who is the owner of a site value? Mr. Fletcher Moulton contends that it is the man who holds the title deeds of the land and the builder, or his representative, and he would get at them by substituting for the present system of rates a dual system with a rate or tax proportioned to the ground value only, and charged upon owners of ground value, leaving a rate on building value to be charged upon occupiers. Mr. Moulton is, in fact, the exponent of the prevailing view that the rating of site values is in the main an affair between the occupier and the landowner. Mr. Harper, an official of the London County Council, defined site value as "the annual rent which, at the time of valuation, might reasonably be obtained for the land as a cleared site, if let for building by an owner in fee, subject to equitable reduction in exceptional cases in which the full site value thus defined is not being enjoyed or obtained by any person or persons." Here, then, are two views which, while they agree as to the nature of site value, are in conflict as to the owner.

The report discusses the two doctrines in the light of a typical instance :—

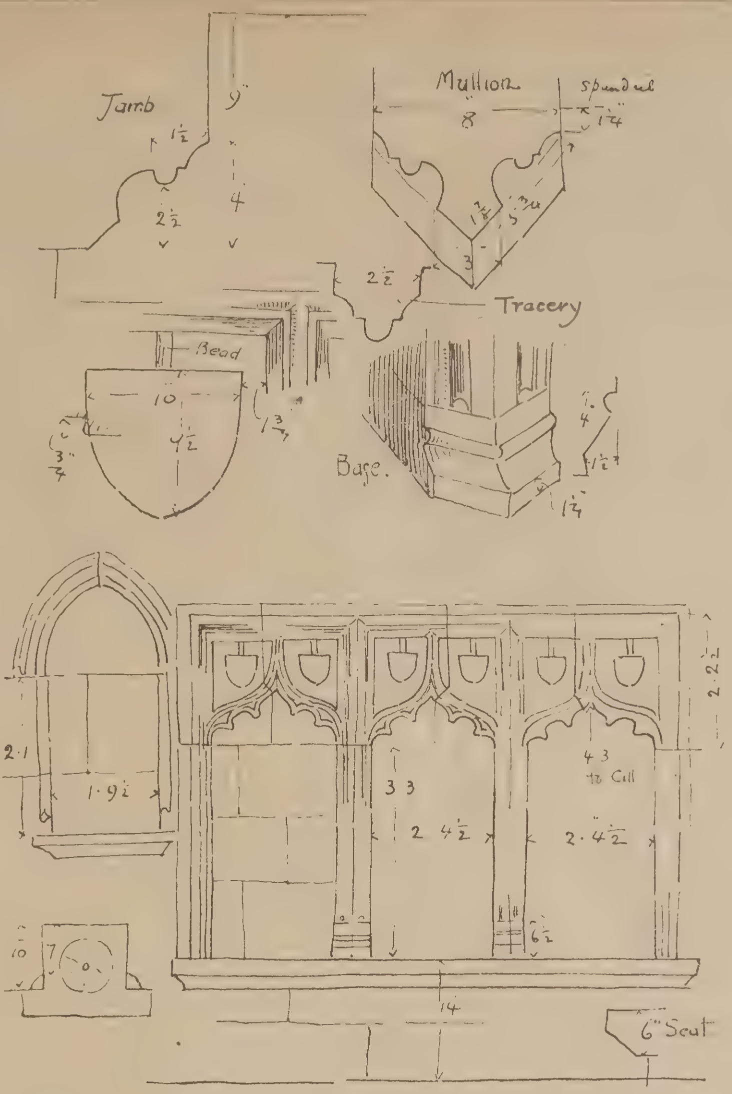
		£
1830	A let land to B for - - -	15
	B built a house and let it to C for	75
1870	C sublet to D for - - -	100
1899	D sublet to E for - - -	120
	Site value - - -	60
	Structural value - -	60
	Ratable value - - -	120

Mr. Fletcher Moulton looks at the question rather from a legal point of view, and pays special regard to the security of the interest. Consequently he holds that A enjoys site value to the extent of £15 a year, and B to the extent of £45. The remaining £15 nett received by B, and the nett receipts of C (£25) and of D (£20), he attributes to the bricks and mortar, or the structural value.

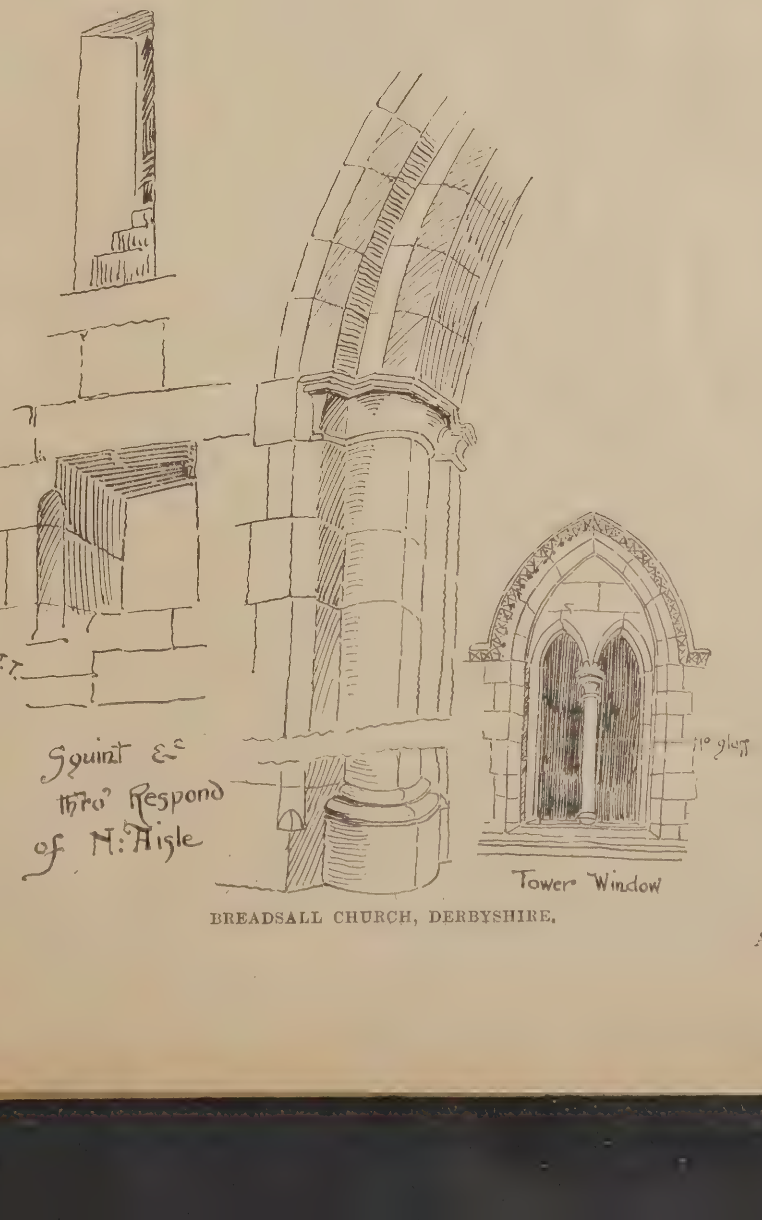
Mr. Harper, from a more strictly economic point of view, attempts to eliminate from each rent the elements which represent, as a matter of fact, the return due to the builder's capital and labour, and calls the residue the site value. Thus he agrees with Mr. Moulton that A enjoys site value to the extent of £15 (the original value of the land), but he holds that B's nett receipt of £60 is simply the return due on the building, and that the remaining £45 of site value has got into the hands of C and D, because the increment of value of a property, apart from new building, must be attributed to the site.

Those who wish to familiarise themselves with the standpoint finally adopted by the Commissioners will find it useful to give this passage their attention. It sets out clearly the dividing line between the two schools of thought; and though certain practical considerations deter the Commissioners from accepting the Harper plan, yet the Harper principle that site value runs up and down from cellar to attic, and from landowner to the last lessee, clears the ground for the ultimate analysis.

A New Chapel at Papplewick is being erected by the New Methodists Connexion. The materials are red and blue bricks with stone dressings. The architects are Messrs. J. & C. Swift. Mr. Ingham, of Basford, is the builder. The fabric is estimated to cost £400, and the furniture £200.



SEDILIA.


J.T.
Squint &c thro' Respond of N: Aisle
Tower Window
1° glass

BREADSALL CHURCH, DERBYSHIRE.

CITIES OF TO-DAY.*

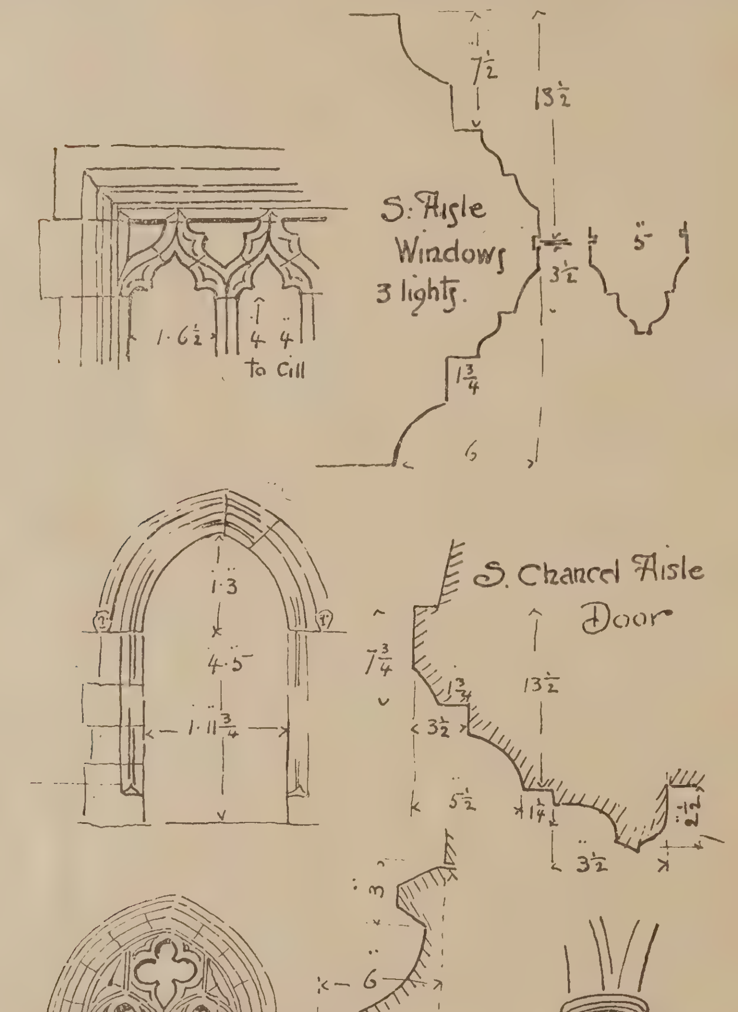
By L. A. MEAD.

THE three prerequisites to health, civic beauty and normal civic life are space, pure air and sunlight. With these insured, architectural beauty, street adornments of fountains, statues, trees and flowers may easily follow. Without these prerequisites, provided by wise legislation and maintained by constant vigilance, all minor beauties of decoration are overshadowed or imperilled or destroyed. The four worst causes of modern city disfigurement are slum areas, crowded suburbs of cheap wooden construction, abnormally high buildings, and discordant settings for buildings, fountains and statues.

The most congested tenement districts in the world are in New York City. Jacob Riis, an expert, declares, however, that the wooden rookeries of Chicago are worse than the tenements of New York, though population be less congested. Boston, San Francisco, and every large city in the country, however new, show a disgraceful section which should never be tolerated. The excessively high rents received for unhealthful tenement house property make them tolerated where money, rather than men's lives, is the chief interest of the community. The examples of an aroused public sentiment in Glasgow, Birmingham, London, and in continental cities, which is beginning to wipe out foul areas and build model houses, needs speedy imitation in American cities.

The Greatest Obstacle.

But the abnormally high building of steel construction, costing from one to three or four millions of dollars, is the greatest material obstacle to modern civic progress. It cannot be wiped out like the rotten tenement block. It has come to cast its blighting shadow for a century upon its neighbours. So long as it stands alone, the dwellers in its upper storeys have immense advantages of light and view, but as soon as every neighbour who is overshadowed builds to equal height the street becomes a noisy cañon, the lower storeys become cellars, the footways are congested with jostling crowds, and all business life becomes destructive of eyesight and nerves. Intercourse with one's fellows becomes a frantic scramble and game of push and grab.

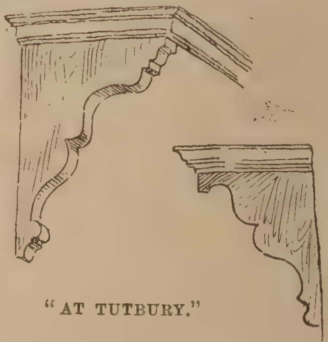


MORLEY CHURCH, DERBYSHIRE.

PORTION OF NAVE ARCADE, ASHBOURNE CHURCH.

To the average business man the view of Chicago taken from the Auditorium seems perhaps a monument of enterprise and business success. To the man who cares for length of days more than for dividends, who values health and beauty and leisure for rational enjoyment, who remembers that he has only one life to live on this planet, such a spectacle seems a hideous commentary on the ideals of modern life. A friend once remonstrated with me on my protests against Chicago's high buildings. "If the people in Chicago want them," she said, "why should you trouble yourself?"

But the people in Chicago have never been asked whether they want them or not, any more than the people in Boston have been asked whether they wanted this monstrous mass of masonry to tower above their narrow streets, or these other buildings which of course are forerunners of future buildings which will darken them. These buildings were put up by the few by taking advantage of lax building laws, in utter disregard of the needs of the many; and, so far as real estate values are concerned, by the vertical instead of the lateral development of the city they have simply robbed Peter to pay Paul, the suburban real estate man losing in proportion as those in the congested districts gain.



"AT TUTBURY."

The High Building per se is not an Evil

when it is well treated on all four sides and shaped like a tower, and when it is surrounded on all sides by ample space; however, such a building, so far as I know, does not exist in the world, and need not be discussed. The high building as it exists is an unmitigated evil to the many, while it is a convenience to the few, and to those few only so long as they can prevent their neighbours from taking advantage of the laxity of the law and following their example.

Boston now limits its buildings to a height of 125ft., or to two-and-a-half times the width of the street; this is much less than the limit in

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* A paper read before the Second Convention of the Architectural League of America.

Chicago and New York, and yet is far higher than is permitted in any city of Europe. In Paris, and in general through Germany, Italy, and Sweden, buildings are limited in height to the width of the street. In Berlin and Vienna houses must not have more than five habitable storeys; in Brussels they must not exceed 69ft. in height, and in London the limit, with perhaps some exceptions on large open spaces, is 80ft.

Reckless Building By-laws.

No country in the world is so reckless in its building laws as America. No country permits the idiosyncrasy or greed of the individual or corporation so to infringe upon the rights of the people and sane conditions of life.

It is claimed that modern business conditions demand the high office-building, even if such a disfiguring apartment building as you see on a Boston street be unpardonable. Concentration and speed are certainly desirable, but pneumatic tubes, telephones, subways and elevators in six-storey buildings, together with a concentration of certain professions or businesses in different blocks or wards, is the only concentration needed where life is rational and well adjusted. Berlin and Paris do large business without sky-scrapers. As compared with us, their business men make less money, but more of them get more out of life, and their wealth is not counterbalanced by the fearful squalor in certain sections which disgraces the rich young cities of our prosperous land.

The modern office-building is an example of

Uneconomic Concentration.

A hundred different businesses, manicuring, insurance, law, landscape gardening, editing, engineering, and what not, are massed together. Why should not lawyers have an office block of moderate height to themselves, and insurance men, and real estate men, and hide and leather men each their own quarters? Would not business be equally well expedited and our cities freed from this pestilence which threatens at any moment to cut off the earnings of years from honest helpless citizens? A 100ft. building in Boston ruined a certain school by casting it in dense shadow. Another property belonging to a widow lost 1,000dols. rental by the perpetual twilight which its high neighbour threw over it. These are but two instances among thousands.

Delay is fatal. Every building compels others to be built in self-defence, and makes future reform intolerably expensive.

The Preservation of Natural Beauties.

The preservation and improvement of natural beauties, as at Morningside and Central Park, New York, and especially the utilisation of waterways, is a matter of prime importance. In Europe, waterways are almost always made accessible to the people and form a chief feature in the beautification of the city. With us the river-banks have usually been given over to purely commercial interests and are covered with dirty mills and warehouses, and not shaded with trees, like the Seine or the Thames Embankment.

Contrast the Merrimac at Haverhill with the Rhine at Mayence or Cologne, or with the business centre of old Nuremberg. Or contrast the Alster basin at Hamburg with the present surroundings of the Charles River basin in Boston, or the borders of the little river that flows through Berlin with the borders of any river that flows through any important city in our country, and our failure to utilise great natural opportunities is apparent.

Settings.

The question of environment, of a suitable setting to whatever has a monumental character, is the next most vital question. In spite of the fact that in many fields we are now producing much better architecture than is the continent of Europe to-day, our people and our city fathers are singularly deficient in demanding that it shall have a proper setting. Admirable buildings are placed in narrow streets or are sandwiched in between others of discordant form and colour.

At Paris one sees the monumental treatment of the Madeleine, which is balanced on the opposite side of the bridge by the Chamber of Deputies, of similar architecture. Ample space and symmetrical arrangement prodigiously enhance the effect of every building. In the dressing of shop windows, in the arrangement of flowers, and in many minor matters, we have learned to avoid the hodge-podge and heterogeneous and to strive for unity and harmony. That we have not done this in our street architecture and in the setting of public buildings is due not so much to our bad taste as to our bad politics and our inveterate prejudice in favour of unregulated individual taste. This individualism permits, as regards private buildings, any dozen men who happen to own each a 25ft. front lot in a given block to mass together a dozen buildings each of different style and colour and height and of different materials. The Paris law, which requires a certain uniformity of skyline, cornice and balconies, and harmony of colour in any given block, would be a boon to every American city. With reasonable laws, our finer building materials, more brilliant colours, and greater beauty in city domestic architecture would make our cities far excel in beauty any in the Old World. No freak or monstrosity would be permitted, and the subordination of each unit to the whole would increase rather than diminish the beauty of each, as was evident at the World's Fair. We should simply exchange unbridled licence for true freedom and have ample scope for any genuine individuality that was worth while.

MORLEY CHURCH.

The setting of all works of art is of about equal importance to the merit of the work of art itself. Of what value to Boston is the statue of Samuel Adams with its present background? Who cares for the statue of Lincoln freeing the slave amid such sordid surroundings? Would not even St. Gaudens's noble statue in Lincoln Park lose half its value were it transferred from its perfect environment and placed here? Would this Gothic fountain in Nuremberg have its full charm were it not for the ample space about it and the Gothic features of its background which accentuate its own loveliness?

Flimsy Wood Houses.

In the detatched suburban house of flimsy wood exists one of the greatest obstacles to beautiful city life. Here jig-saw trimming, grotesque gables and excrescences and patches and stripes of various colours often make as unpleasant a conglomeration of lines and proportions as the world can show. The dangerous crowding of such buildings as the city extends its limits makes the detached house (only 3ft. or 4ft. from its neighbours) worse than a brick block in respect to danger from fire. The law should prohibit any wooden building being erected within 50ft. of another building of wood. Continuous blocks of broad shallow brick houses built around large open squares give all the advantages of air and light and more privacy than the wooden house squeezed in between others. It can be made architecturally beautiful and harmonious, and, as is shown by many delightful modern English residences of brick for persons of moderate means, is far better than the fantastic possibilities of the average American wooden suburb.

Advertisements.

Among less important matters for consideration, the growing nuisance of the huge advertising bill-board deserves attention. Were it not so temporary in character, and so certain to be abolished as soon as an aroused public shall demand it, it might be considered a matter of great moment, as indeed it is for the time being. The desecration of rock and cliff and forest by the advertising fiend would seem to have reached almost the limit of endurance were it not that those who suffer consider themselves so helpless in the matter. In Massachusetts a law has been passed whose enforcement will materially modify the disfigurement of roads. It should be the duty of all citizens to make enquiry of town authorities whether permission has been given when any advertisement appears upon highways and town property. In nine cases out of ten in Massachusetts no such authority is given, and the good citizen is in duty bound to see that the offender removes the offence or is prosecuted.

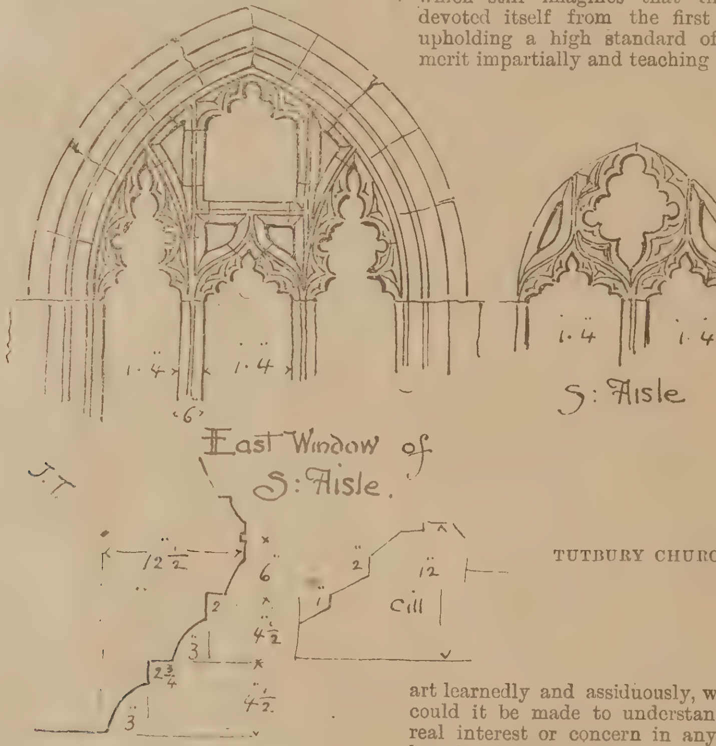
The amounts paid for disfiguring a whole landscape are ridiculously small. The chief advertising agent in Boston pays only 10dols. to 25dols. annually for the opportunity to ruin a whole landscape. The average person is as blind to these disfigurements as a newsboy is oblivious to bad grammar. Eyes he has, but the cataract of commercialism has grown over his sight so that to a great extent he sees neither beauty nor ugliness, nor knows a good thing or a bad thing when he sees it.

Who will Effect the Reform ?

To whom shall we look for the remedy from the evils which have here been thus briefly outlined? Certainly not to artists especially, for, strangely enough, a man may be an expert and enthusiast on bronzes and water-colours and book-covers and be as indifferent as a street-sweeper to the ugliness of skylines and bridges and posters. Moreover, if he does see, and suffer in the seeing, he may have no power of initiative for reform. I fear we cannot look to the daily press; for it, for the most part, must print only what stockholders and advertisers find it their advantage to have printed. Certainly not to the children, though they are learning to draw, and are studying Perry pictures; they can do nothing before much of the evil will become irreparable. We cannot wait for the next generation to do our work. And most certainly we cannot look to wealthy patrons of art to help much in beautifying our cities. In spite of many generous public gifts, the millionaires can do nothing of great importance in producing beauty until they cease promoting that very legislation which now protects their class in producing ugliness. The sky-scraper, the chimney belching forth black soft-coal smoke, the huge advertisement in the landscape—these are the things which the rich as a class will not help to remove, for they belong to them.

To whom then shall we look for a remedy? To the good citizen. It is not necessary that the good citizen should know anything about art: it is necessary that he should have common-sense. He may not know Gothic from Greek, but he must know that he does not know, and that questions of beauty must be left to experts of beauty, just as questions of public health must be left to experts in the science of health.

A board of beauty made the White City the glory and the marvel that it was. When the good citizen forces partisan politics to know its place and not intrude where it has no business to be, then such a board he must again call into requisition and let knowledge and taste give counsel and even prohibitary laws to ignorance and whim. The man, for instance, who fancies yellow brick, and wants to put a yellow brick house into the midst of a brown-stone block, like a slice of sponge cake set on edge, must be taught that no man buildeth to himself, because no man liveth or dieth to himself; that we are all members one of another, and thus no man in a civilised community may mar his neighbour's little plot by doing what he pleases with his own. The good citizen will find this no tyranny, but a welcome protection from his neighbour's follies. In proportion as he attains to beauty of holiness in his citizenship will he recognise the holiness of beauty in his city.



TUTBURY CHURCH.

The New Hop Market Hotel, Worcester, is approaching completion. Messrs. H. Rowe & Son, of Worcester, were the architects, and Messrs. Bromage & Evans the contractors. Messrs. Ward & Son have supplied the hot-water apparatus, and Messrs. Keen & Co. carried out the electric lighting of the building.

A SEVERE CRITICISM OF THE ACADEMY.

MR. J. STANLEY LITTLE has been contributing some articles on the Academy to the "Morning Post." In his second article he says:—

The question may well be asked how it has fallen out that the Academy is able to exercise so commanding an influence for evil over the minds and consciences of the ten or twelve thousand artists—to say nothing of the art craftsmen—of the kingdom. The story of the Academy's origin has been told so often that it is scarcely necessary to repeat it. The Academy was the offspring of the intrigue whereby George III. was induced to give his patronage and support to an artistic coterie, whose object in wishing to secure royal favour for the society they founded was not to elevate art in the abstract and artists generally, but to aggrandise themselves at the expense of other artists and art institutions. This was in 1768. To establish the fact that the Academy had a corrupt origin would not perhaps be damaging evidence against it. . . . None the less the larger public, which still imagines that the Academy has devoted itself from the first to the task of upholding a high standard of art, rewarding merit impartially and teaching the principles of art learnedly and assiduously, would be shocked could it be made to understand that it has no real interest or concern in any of these things, but that from its foundation to the present time it has used its privileges and advantages solely in the furtherance of one object, and one alone—the aggrandisement and prosperity of the Academy as a corporate body and of its members as individuals, and, as a corollary, the suppression of all possible rivals.

One article of its original constitution alone would be sufficient warrant for this statement. For one hundred years this article or rule rendered ineligible for election any candidate who belonged to any other art society. This rule was rescinded when the Academy found itself strong enough to despise and defy all rivals, and when certain Royal Academicians discovered that it suited their convenience to be connected with other art societies. I am reminded at this moment of a pertinent passage in a letter sent from Venice by Albert Dürer to his friend Pirkheimer. "With the exception of painters," Dürer wrote, "everyone wishes me well." And this has been the case with powerful and independent outsiders in this country. With the exception of the Academy, everyone has wished them well. Thus foreign artists of distinction, with one or two exceptions, have been excluded from the annual shows of the Academy, while the treatment meted out to such individual painters as Romney, Crome, Bonington, David Cox, Alfred Stevens, Cecil Gordon Lawes—to confine instances to the dead—is sufficient evidence of Academic intolerance and exclusiveness, and would warrant, were not additional and overwhelming support of the indictment forthcoming, the assertion that the Academy does and has done its utmost to stifle and suppress all talent which has grown up independent of and irrespective of its system and influence.

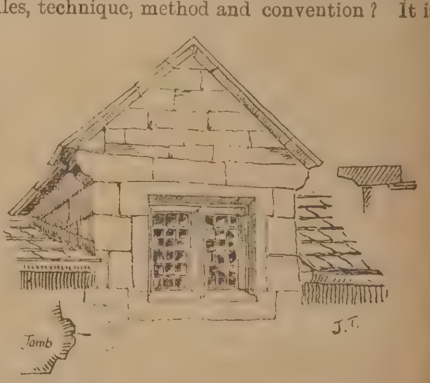
Efforts for Reform.

. . . During the past century strenuous and repeated efforts were made to bring the Academy to account. But the Academy, having assumed a national rôle, has never, from the practical point of view, been ousted from it. . . . Of the attempts to bring the Academy to some kind of recognition of its duties to the public, the most important have been the appointment by Parliament of a Select Committee in 1836, and of a Royal Commission in 1863; the Chelsea movement led by Mr. Holman Hunt, Mr. Walter Crane and Mr. George Clausen in 1886; and the movement which Mr. W. J. Laidlay initiated two years ago, leading to the public ventilation of the question during the summer of 1899 in the columns of the "Morning Post," and to the gallant attempt of Lord Stanley of Alderley in the House of Lords to induce the Government to take action on the recommendations of the Parliamentary Commissioners of 1836 and 1863.

The Select Committee's Indictment.

The Select Committee of 1836 opens its report with an indictment which, if it went no further, would in itself be simply damning. It runs thus: "The Committee advert with regret to the inference they are obliged to draw from the testimony they have received, that from the highest branches of poetical design down to the lowest connection between design and manufacturers the arts have received little encouragement in this country." Now this stricture is as true to-day as it was then. Not long since we heard a good deal about the sins of commission and omission of the Science and Art Department at South Kensington. But it must never be forgotten that South Kensington, be its faults and lapses what they may, and later the various arts and crafts societies and guilds, have established and developed the teaching and practice of the applied arts, which ought to have been one of the first functions and cares of any Academy claiming to represent the nation and to be its trustee. The Academy has never lifted its little finger to encourage tendencies making for the application of the fine arts and the arts of design to manufactures. It has given no place to any arts save those of picture-painting in oils and sculpture, for water-colour and architecture cannot be said to have any real place at the Academy. The minor arts, ceramics, glass, metal and woodwork have been absolutely ignored. As a matter of fact, the decadence of Great Britain in the so-called minor arts, in architecture and furniture, in jewellery, stone carving, silver and gold smithery and ironwork, if it cannot be said to date from the foundation of the Academy, may fairly be said to synchronise with the day which saw the Academy firmly established as the acknowledged head and centre of national art.

The foolishness of the present system of teaching, so called, at the Academy schools is now generally understood and acknowledged. It is a case of the blind leading the blind. . . . Moreover, each painter develops his own methods and his own art principles. Now, how is a young man or woman desirous of learning the rudiments of art to acquire knowledge from half a score of teachers who all have their individual rules, technique, method and convention? It is



DORMER TO COTTAGE AT ROWSLEY.

very well for a painter or sculptor who is beginning to find himself to come under the influence of various masters, but not for one who is yet to feel his feet. . . . The art education of the Beaux-Arts is decidedly the best in the world, and the schools attract young painters from every part of the civilised globe. There are in France ten or more other schools of the fine or decorative arts, and the Ecole Nationale des Arts Décoratifs de Paris is only second in importance, if second at all, to the Beaux-Arts. In brief, both in France and in Italy the organisation for teaching the graphic and plastic arts is infinitely better than anything this country can boast. Throughout France, and in a less degree Italy, the system of State schools discovers any boy of talent who may appear in the remotest village, and such boy, if he should prove to have the stuff in him, is helped to the foremost place by municipal, and afterwards by State, assistance. In England in art, as in most other things, it is the practice of all teaching agencies to ignore nascent talent appearing in odd places.

NEW LABORATORIES AND A DAIRYING SCHOOL AT LEEDS.

On Friday last Earl Spencer formally opened the new educational buildings which have been erected at the Manor Farm, Garforth, Leeds, by the East and West Ridings Agricultural Council. The buildings are intended to serve a double purpose: in the first place, they contain lecture rooms and laboratories for students taking the course of instruction given in the Agricultural Department of the Yorkshire College; and, secondly, they provide a practical dairying school, equipped on the most modern principles. The buildings face the road leading from Garforth Station. Planned by Messrs. Smith & Tweedale, architects, of Leeds, they form a conspicuous object seen from the railway. The design is carried out in red-pressed brick, with stone dressings, the roofs being covered with red tiles. The portion next to the railway line is of two storeys, and contains the rooms intended for lecturing and research purposes. Passing into the entrance-hall, one finds on the left hand a large well-lighted lecture-room, fitted with single desks for the students, and having on a platform at the upper end a desk about the width of the room, so furnished as readily to be converted into a chemical lecture table. On the opposite side of the hall from the lecture-room is a professor's room. The rest of the ground floor is occupied with a male students' sitting-room and study, to which lavatory accommodation is attached.

On the first floor, reached by a massive stone staircase, which is lighted by a large tinted-glass window, there are five rooms. One of the largest of these is devoted to general bacteriological work. The chemical laboratory is also a spacious room, equipped with all the apparatus necessary to enable students to specialise in some branch of research. The building is furnished with the electric light, the source of supply being a dynamo driven by a steam engine at the farmsteading. For heating purposes there is a hot-water circulation from a boiler in the basement, where there is also a boiler providing the steam required in the working dairy.

The dairying school occupies a side wing, one storey in height, adjoining the main building. The separating-room is 24ft. by 12ft., and the churning and making-up room 32½ft. by 24ft. The separating and churning rooms, both lighted with windows at each end, are divided by a glass and wooden partition, so that the demonstrator has all the students under observation. Every arrangement is made with the view of securing absolute cleanliness. The walls are covered with white glazed tiles; the woodwork is painted white and enamelled; the shelving is of polished slate; and the ventilation is on the most approved principles: the premises are heated by steam and lit by electricity. Off the separating-room is a milk-setting room. A weighing and packing room, divided by a movable glass screen from the room where butter-making is carried on, and a cold-storage room, complete the equipment of one of the most extensive and up-to-date dairying schools in the United Kingdom.

COMPETITIONS.

AN INSTRUCTIVE CODE.

The following competition code is the result of the joint efforts of the Architectural League of America and the American Institute of Architects:—

A competition as a means for the selection of an architect may properly assume one of the following forms:—

A. *Limited* to a certain number of architects, each of whom is invited to take part.

B. *Open* to all who desire to enter or to all of a certain class.

C. *Mixed*, certain architects being invited, but others being at liberty to take part.

Payment of Competitors.

In all competitions the first prize should be the award of the commission to design the building and superintend its construction, and the programme should definitely state that the successful competitor will be so retained, and that he will be paid for his services at the rates established by the American Institute of Architects. In certain cases, however, this procedure may not be legal, and the course to be pursued as to the successful competitor should be clearly stated. To provide for the contingency of delay or of the discontinuance of the work, the programme should provide for a substantial payment to the successful competitor on the award of the competition, such payment to be regarded as on account of the final commissions.

Payments to unsuccessful competitors should be as follows:—

In limited competitions each should be paid a fixed amount. In open competitions prizes fixed in number and amount should be provided.

In mixed competitions the two classes of competitions should be paid in the manner above described.

The Professional Adviser and the Jury.

It is highly desirable, in the interests of both owner and competitors, that a professional adviser should assist in the preparation of the programme, and that the professional adviser, or a competent jury consisting at least in part of experts, should assist in making the awards.

The professional adviser or jury may have full power to make the award, or they may select a number of designs and, placing them in the order of merit, leave the final choice to the owner or his representatives. Where possible, the adviser or the jury should make a positive report in favour of one design, and recommend the employment of its author as architect for the building.

The Programme.

The programme should be so drawn as to form a contract. It should—

a. Name the owner of the structure forming the subject of the competition, and state whether the owner institutes the competition personally or through representatives. If the latter, name the representatives, state how their authority is derived, and define its scope.

b. State the kind of competition to be instituted, and, in limited competitions, name the competitors; or, in open competitions, if the competition is limited geographically or otherwise, state the limits.

c. Fix a definite time and place for the receipt of the designs. The time should not be altered except with the unanimous consent of the competitors.

d. State the limit of cost, if fixed; the desired accommodation, and the condition of the site.

e. Fix uniform requirements for the drawings, giving the number, the scale or scales, and the method of rendering. As the presentation of a general scheme (rather than a design perfectly studied in all its parts) is the object of the drawings, they should be of the simplest kind capable of explaining such a scheme.

f. State whether the submission of more than one design by a competitor is forbidden or permitted.

WINDOW JAMBS IN QUEEN MARY'S APARTMENTS, TUTBURY CASTLE.

g. State whether the competition is to be anonymously conducted or not, and if anonymously, provide the method.

h. Name the judge or jury, or provide a method for their selection. Define his or their power.

i. Provide for the placing out of competition of any drawing which violates the terms, or of any set of drawings whose authors have so disregarded the terms as to deserve the extreme penalty.

j. Provide that during the competition there shall be no communication upon anything relating to the competition, except in writing, between any competitor on the one hand and the owner, or any representative of the owner, the professional adviser or any juror on the other, and that any information, whether in answer to such communication or not, shall be given in writing simultaneously to all competitors. Set a date after which no question will be answered.

k. Fix the nature or amount of the awards or prizes.

l. State, in case the professional adviser or jury is not empowered to make the award, in whom such power is vested.

m. Fix the period of time within which the final decision will be rendered.

n. Provide for sending the decision and a copy of the report of the professional adviser or of the jury to each competitor.

o. Provide that no drawing shall be exhibited or made public until after the award, and not then without the consent of the author.

p. Provide for the return of unsuccessful drawings to their respective authors within a reasonable time.

q. Provide that nothing original as to this competition in unsuccessful designs shall be used without compensation to the author of the design in which it appears.

KILSYTH'S NEW ACADEMY.

ALTHOUGH some little touches have yet to be given to part of the buildings and grounds, nearly the whole new Burgh Academy at Kilsyth, Glasgow, is now in full use. It has been built of freestone from designs by Mr. Robert Hay, 147, West Regent Street, Glasgow. Facing Shuttle Street, on the ground floor, are six large windows resting on a moulded sill-course, and the architraves are moulded in blocks alternately, while the moulded lintel has keystone and moulded cap. Light is provided to the upper floor front by another half-dozen windows, situated exactly above the ground floor series. and starting from a moulded sill-course. The whole is surmounted by a cornice and blocking course. Two entrances to the Academy are provided, the one on the north for the girls, and the other, on the south, for the boys, access being gained to each of them either by gateways from Shuttle Street or from the Craigends side by the respective playgrounds. Entering by the girls' porch, there is found on the right hand a room for the female staff, and adjoining a cloakroom for the girls, while on the left is a stair leading to the upper floor. The school is arranged in classrooms, facing east and west, these classrooms being separated by a central hall about 15ft. wide. The ground floor is divided into five classrooms, three to the east and two to the west, each room providing accommodation for seventy pupils. Access is given to the rooms on the second storey from a balcony running round the central hall. The classrooms on this storey consist of four at the back, each capable of seating fifty-four scholars; and four at the front. Of the latter, the two central ones will accommodate seventy pupils each, while in the one room at the extreme corner is space for thirty pupils, and in that at the opposite corner forty pupils can be placed. The building can thus accommodate 776 scholars. Ventilation is provided by Messrs. Donald & Donald's air-pump system. All the classrooms are lined with pitch-pine to a height of 4½ft. from the floor, and finished with "Jewel" desks corresponding in colour. Heating is on the low-pressure hot-water system.

The contractors were: Mason, Messrs. George Sharp & Son, Glasgow; joiners, Messrs. Withers & M'Nab, Kirkintilloch; steel and ironwork, Messrs. Blaydon & Co., Glasgow; slater, Mr. David Logan, Kilsyth; plumber, Mr. James Raeside, Glasgow; gas fittings, Mr. Robert Mason, Glasgow; plasterer, Mr. Williamson, Kirkintilloch; glazier, Mr. John C. Hall, Glasgow; painter, Mr. John Morton, Kilsyth; heating, Messrs. Hunter, M'William & Co., Glasgow; furniture, Bennet Furnishing Company, Glasgow. The cost of the new Academy and of the alterations upon the old one, including furnishings, has been about £10,000.

A New Church at Stonebroom has been erected from the designs of Mr. P. H. Currey, of Derby, to seat 260 persons. The portion of the church at present erected will cost, with fittings, a sum of nearly £2,000, of which £300 has still to be raised.

New Patents.

These patents are open to opposition until July 30th.

1900. — Band-Sawing Machines. — 3,471. H. NOBLE & P. LUND, Felling-on-Tyne, Durham. With ordinary band-sawing machines it is impossible to cut lengths greater than the diameter of the saw pulleys or the space between the saw and the main frame. To get over this disadvantage, according to this invention the machine table is arranged slantwise to the axes of the saw pulleys.

Firegrates.—9,850. E. J. PURNELL, 66, Hatton Garden, London. In order to improve combustion, the grate is made with a false back, through which partially-heated air passes to the fuel.

Artificial Stone.—13,467. T. M. THOM, 59, Lordship Lane, Wood Green, N., and A. C. OAKES, 7, Martin's Lane Cannon Street, London, E.C. A mixture of pure lime and unburnt limestone, in the proportion of a third of one to two-thirds of the other, both reduced to fine powder, is slaked with water and moulded. The blocks are then dried and placed inside a closed vessel capable of resisting an internal pressure of 300lb. or 400lb. to the square inch, into which carbonic acid gas is introduced for the purpose of hardening the blocks.

Windows.—17,725. J. BOARDALL, Clare Road, Wyke, near Bradford. The lower part has French windows with a vertically sliding sash above.

The following specifications were published on June 22nd, and are open to opposition until August 5th.

1900.—9,626, EDWARDS, window fasteners. 10,977, SINCLAIR, decorating brass, copper and other metallic objects, tiles or ware. 11,014, SYMONS, materials for floors. 11,061, ASKHAM & KEEVIL, apparatus for crushing or grinding. 11,852, MELDRUM BROTHERS, LTD. & ORTON, kilns. 12,133, PECKOVER, stone saws. 12,297, RUSSELL, pump. 12,475, MITCHELL, chimney cowls and ventilators. 13,591, EASTMEAD & MOFFATT, hoisting apparatus. 15,571, WILSON, draught-preventing means for doors.

1901.—4,222, CHOPARD & CHOPARD, method of capturing pure air and means for warming and distributing same in insalubrious centres. 6,054, CALDWELL, manufacture of expanded metal. 6,177, CURTIS, manufacture of expanded metal. 7,466, ARMITAGE, ARMITAGE, ARMITAGE & KEIGHLEY, stone-cutting machines. 7,742, ADAMS, fire-screens. 8,887, MAYER, gasholders.

These patents are open to opposition until August 5th.

1900.—Kilns.—11,852. MELDRUM BROTHERS, LTD., Atlantic Works, City Road, Manchester, and J. S. ORTON, 35, West Avenue, Derby. The type of kiln to which this invention more particularly relates is one used for cement in which the materials are heated on floors having furnaces and flues beneath. An external furnace is employed, so that the flues may be arranged to underlie the whole of the floor. By these means the cost of maintenance is reduced and a greater uniformity in the clinker is secured.

Chimney Cowls.—12,475. W. MITCHELL, Albert Works, Waterfoot, near Manchester. In order to prevent the cowl being turned completely round by the wind, thus causing downdraught, a hanging brake, lined with felt or other suitable material, is fixed to the outside of the annular cover. When the side pressure of the wind becomes excessive the brake swings inwards and so checks the movement of the cowl, returning to its normal position as the wind abates.

1901.— Expanded Metal. — 6,054. W. L. R. CALDWELL, 10, Murray Street, New York, U.S.A. The object of this invention is to provide a simple, effective and comparatively-economical machine for producing expanded sheet metal. The slitting is done by a pair of rolls having a series of fingers and another pair provided with cutters. The slitting device does nothing but slit the metal ready for the stretching or expanding device, which is independent, and is adapted to take hold of the sheet and stretch it uniformly throughout its width. Finally, there is a pair of rolls for setting the walls of the expanded meshes at the desired angle.

The following specifications were published on Saturday last, and are open to opposition until August 12th. A summary of the more important of them will be given next week.

1900.—10,162, FRENCH, taps or valves. 12,038, HANSEN, cocks and valves. 12,070, GAUNTLETT & LLOYD, production of designs upon glass and other surfaces. 12,132, LOWOOD, GARDNER & ARMSTRONG, machinery for making bricks. 12,654, MURDOCH & MURDOCH, saw guards. 12,970, HUGHES, machinery for pressing bricks. 13,371, SPENCER, securing glass in window frames. 13,699, KLABER, stencil sheets. 13,919, T. C. FAWCETT, LTD., & BOTTOMLEY, machines for making and pressing bricks and tiles. 14,138, HENNINGS, apparatus for the production of acetylene gas. 14,542, HOWORTH & ROBINSON, apparatus for setting or marking out carpentry or joinery work. 15,042, BOUSFIELD, compound rollers for sliding doors. 16,643, KEEL, firegrates. 17,029, VACHELL, sash frames of windows. 17,285, SEWELL, sliding sash-windows. 17,995, COPPARD, swing stages or cradles. 20,652, RÖDER, scaffolding.

1901. — 1,549, WATSON, centre-bit drills. 2,948, GARDINER & ABBOTT, floor sawing and rabetting machines. 6,016, ONGLEY, workmen's time recorders. 7,610, BROMHEAD, taps, valves and faucets. 8,068, PARSONS, manufacture of slag blocks. 8,282, BOAS, manufacture of building materials. 8,536, WUHRMANN, pumps. 8,881, JOHNSON, apparatus for manufacturing gas. 9,525, GOOD, glass pressing or moulding apparatus.

POPLAR HOSPITAL.

A NEW wing has been added to the Poplar Accident Hospital by the munificence of the Drapers' Company. It consists of a lofty block of buildings erected at a cost of about £14,000, and is situated on the eastern side of the surgical ward block of the old building, being an extension of the out-patients' department and an addition of three medical wards and quarters for the staff. The basement is devoted to the out-patients' department, in which surgical and medical cases are separated, with waiting, examining and dressing-rooms for each department, the former out-patients' department being converted into a spacious general waiting-room. Upon the ground, first and second floors are the three wards (41ft. long by 28ft. 6in. wide) for ten medical cases each. The wards are approached through the old surgical wards, but have, in addition, their own staircase and outside escape stairs, with ward scullery, bathroom, sink-room and other sanitary accommodation in spurs at the east end, the sisters' room at the west end, and day-rooms upon the ground and first floors. Each ward has a wide balcony upon the south front, overlooking the docks and river. The floors are laid in ornamental terrazzo mosaic in panels and borders, the walls and ceilings being plastered. The lofty windows are provided with extract ventilation flues. The third floor provides accommodation for the nursing staff, and includes a nurses' sitting-room (32ft. by 12ft. 6in.) with large square bay, and seven nurses' bedrooms, besides linen storage and the necessary sanitary accommodation. The sitting-room, which has been pleasantly and almost luxuriously decorated and furnished, faces the south and south-east, and possesses extensive views over the Thames valley and Kentish hills. The fourth and fifth floors are occupied by servants' bedrooms and a broad flat for recreation, a portion of which is covered with a shelter roof. The new buildings, like the old, are constructed throughout with fireproof floors and stairways, and close attention has been paid to the perfection of the sanitary work. The builders were Messrs. Harris & Wardrop, of Limehouse, who have executed this and the whole of the other additions in connection with the main hospital building. The architect was Mr. Rowland Plumbe, F.R.I.B.A., the architect of the hospital.

NEW BATHS AT PORTOBELLO, EDINBURGH.

THE new baths at Portobello, Edinburgh, opened last week, are built of Dumfriesshire red stone, and were designed by Mr. Robert Morham, the city architect. There are swimming baths, and to them are added Turkish, spray, and douche baths. Facing the sea, on the first floor are retiring and reading rooms. The front of the baths skirts the Promenade, and admission is gained there. The entrance is divided in duplicate, ladies entering by the right and gentlemen by the left. Beyond these doorways there is a spacious vestibule, which is divided into two parts by massive columns and entablature of Doric order. To the left and right of the entrances are the passages to the plunge baths. In the portion allotted to gentlemen there are six first-class baths, with twelve dressing boxes; while in the parts used by ladies there are four baths, with eight dressing boxes. One of the prominent features of the baths is the arrangement whereby a ready supply of salt water can be had. This, it is reasonably believed, will prove one of the strongest attractions of the baths.

The hall in which the large pond is laid out measures 95ft. by 55ft. The swimming pond is 75ft. by 35ft., the depth of the water being 7ft. at one end and 3ft. 6in. at the other. Along the sides of the hall are fixed 56 dressing boxes. Cast-iron columns, with moulded capitals, divide the hall longitudinally and support the gallery and the roof. The south end of the hall is portioned out as a gymnasium, which in turn provides all the athletic requisites commonly used at galas and different aquatic exhibitions. The gymnasium measures 32ft. by 30ft. At the north end of the baths is an alcove measuring 33ft. by 14ft. At the private entrance to the baths from Melville Street, and adjoining the gymnasium, is a resuscitation room, in which will always be ready the necessary medical appliances, and which is also fitted up with heated baths. There is a similarity between the baths for women and those for men. Situated between the respective ponds are the second-class baths. They differ from the first-class baths in being under the control of the attendant and not of the bather. Adjacent to these baths is a sitz bath, and near it are the offices for the superintendent and female attendants.

The Turkish bath occupies the centre of the southern portion of the building. It consists of two hot rooms, the laconicum and calidarium, where the temperature will range from 200 to 210 degs.; a sudatorium at a temperature of about 190 degs., and the tepidarium or cooling room. The shampooing room, which is fitted up with the usual spray, douche and other apparatus, adjoins the sudatorium, but is entered by a disconnecting porch. There is a Russian vapour bath in the same part, while here there is also a cold plunge bath 16ft. long by 5ft. wide. The fittings of the tepidarium are of the most complete kind.

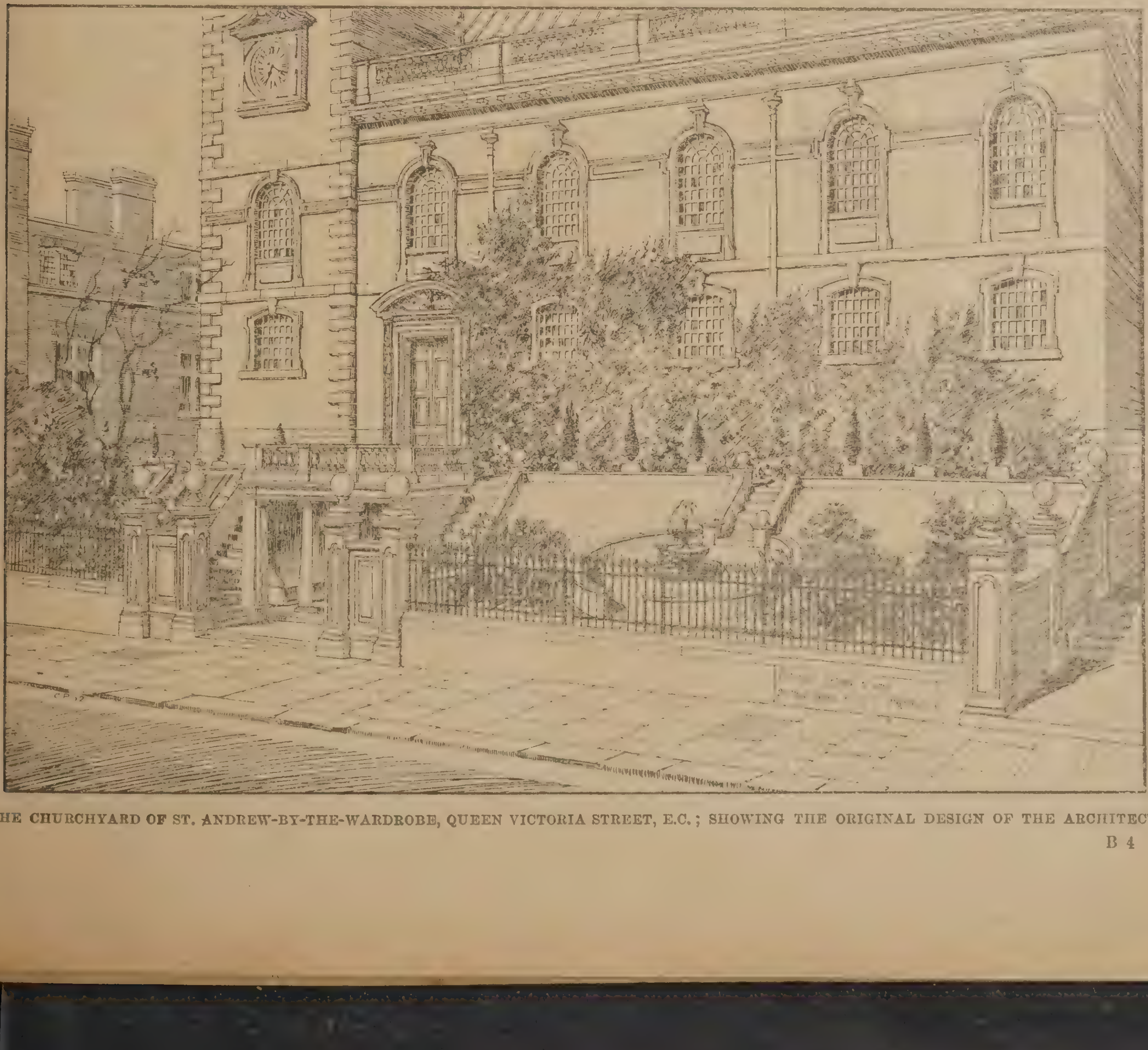
A very prominent arrangement exists on the first floor of the building towards the Promenade. This consists of a series of rooms for the use of visitors. The centre room has been fitted up as a refreshment buffet, and is connected with the kitchen in the flat above by means of lifts. Adjoining the refreshment room there is also a smoking-room.

The Corporation had the benefit of expert advice in connection with the purity of the sea water, and as a result have adopted a system whereby the water is pumped from a point 400 yds. distant from the Promenade. The boiler, which is one of the principal portions of the plant at the baths, is a 22ft. by 7ft. Sinclair's Patent No. 1, and generates steam for the whole building. This steam is used for heating the water of both ponds, driving the pump, heating the building, heating the salt and fresh water, and the Russian and Turkish baths. The salt water is pumped up from beyond low-water mark by means of a Worthington steam piston pump, capable of delivering 15,000 galls. per hour, and the water is drawn from the sea by means of a 10in. pipe. The water is then put through a Reeves filter, and thence sent to the pond, and to a tank for sea water, which holds 3,600 galls. and supplies the plunge and other baths. The plunge baths, which are sixteen in number, have both a salt and a fresh water supply.

The drainage of the building was throughout executed under the supervision of the [illegible] engineer, and is of iron piping. [illegible] was experienced with this work owing to the sea water coming beyond the level of the sewers. The pumping and filtering machinery has been erected by Mr. J. Reid Ellis, Portobello, local agent of the sole licensees, Messrs. Mather & Platt, of Salford. The other contractors were: mason work, Messrs. Kinnear, Moodie & Co.: plaster work, P. F. Cavanagh; engineering work, Messrs. Mather & Sons; and plumber work, Messrs. Morrison & Son, a great part of whose work was of a special nature, and from special designs prepared by the firm. The cost of the baths has exceeded £30,000.

A CITY CHURCH GARDEN.

AT the present time the churchyard of St. Andrew-by-the-Wardrobe in Queen Victoria Street is unseen from the street, its growth of pretty shrubs being obscured by a high brick wall. This obstruction is to be removed, and the space thrown open to the street. The accompanying illustration shows the alterations that are projected in connection with the churchyard. Messrs. Banister Fletcher & Sons are the architects. The illustration shows the *original* design for the rearrangement of the existing steps by the formation of two flights of side steps and the construction of a balcony, the lower portion of which would form an alcove, while the upper part would provide an open space available for seating accommodation. The present arrangement is, however, confined to the removal of the existing ugly brick wall, and the erection of stone gate piers and wrought-iron railings in keeping with the general design of the church. The ground behind the railings is to be sloped up to the terrace in front of the building. This ground will be turfed and laid out as a garden. The fountain shown in the sketch also forms part of the original design.



THE CHURCHYARD OF ST. ANDREW-BY-THE-WARDROBE, QUEEN VICTORIA STREET, E.C.; SHOWING THE ORIGINAL DESIGN OF THE ARCHITECTS.

PURE DESIGN.

HOW IT SHOULD BE STUDIED.

THE following are extracts from a report recently made by the Committee on Education of the Architectural League of America:—

QUESTION: A. "Should architectural design and the study of historic styles follow and be based upon a knowledge of pure design?" B. "How can design in the abstract be best studied?"

ANSWER: "The 'historic styles' should be studied as solutions of the problems which were presented by them in their time. It is a fact that too much stress is laid upon this matter. It is of very secondary importance. It is the most serious blunder of the schools that the 'historic styles' are impressed as of primary importance. The schools are the only influence in the architectural life to-day which seeks to keep these ghosts imbued with artificial life. Were America free of influence from foreign schools, the conviction is forced home to us that by this time its people would have made more progress in substantial architecture. All in all, the results might not have been better, but, upon the other hand, they could not have been worse, or more enslaving and retarding in effect. This is proven by the universal progress which is recorded in all departments in which 'schools' have not existed, and consequently have not interfered The shortcomings, however, are not those of architecture nor of archæology, nor is this an argument against schools, but the art of education itself is only in a formative state and only but recently has itself become progressive and self-reformatory. We would much prefer to go to

The Root of the Whole Matter

and discuss the queries: 'Of what does architectural education consist? How can it best be imparted to the student?' The root answer to both would be: Hereditary disposition on the part of the student; his physical and mental fitness; sympathetic environment. Here we have the school, the system of imparting knowledge, the methods of acquisition, the subject, the materials, and the object all combined. The school, the student and the course are but details growing out of this general proposition. The profession of education reaching out to inform itself as to its own functions, looking for light that it may behold the fruition of its own ends, asks itself, first of all: 'Of what does any kind of education consist? How can the various kinds be imparted to the various individualities of students?'

"The problem of architectural school education applies equally, although with less force, perhaps, to other educational departments. In the sciences and in law, for instance, definite and absolute quantities and propositions are dealt with, whereas in architectural art we may only say of what it has consisted in the past and admit with more or less reluctance that the materials, the methods, and the forms and organisation of modern life make the imitation of the real art of the past but mockery of the present. We testify to lack of knowledge and inspiration, to wrong analysis, to an education which is worse than none at all, by dogmatic insistence that the art-triumphs of the past must contain the solution of the new problems of to-day. But it is all very well to make demands upon the schools. The school itself must have its own disposition, its own character, its own environment. The hereditary disposition of the American school must be the spirit of American institutions and American inventiveness and progressiveness. Its environment must be one free from influences beyond its own, of spectres and shadows. Its equipment must consist of an understanding that there are real modern problems of architectural necessity to be met with, real modern materials as evolved by modern knowledge.

One National School.

"Finally. In order that an art school may create its own atmosphere and fulfil its purpose, contain in itself an inspiration and an incentive to work and study, all the various art branches of the colleges and universities of the country should be detached from other branches of study and be amalgamated in one American Art School, thus gaining in scale, volume, influence and effect through concentration and through singleness of purpose.

"Answering the final question then, under these conditions only, 'Can pure design be best studied?' Given now a bouyant and vigorous American student-boy under the tutelage of independent and progressive men, and who shall say what are the restrictions set upon the American architectural art of the future!"

Builders' Notes.

Building at Elland.—The builder seems to be busy in Elland, and is likely to be for some time to come. Not only are the public baths growing out of the ground, but several other buildings are in course of erection. The erection of the new Conservative Club in Victoria Road is proceeding apace, and the roof may be on by about September. The new church is being erected in Savile Road. Not many men are engaged on the job, and thus the erection is proceeding but slowly. As to other buildings, roofs are being put on five new houses in Savile Road and four new dwellings in Garden Street. There is still a dearth of houses.

The Granite Quarries in County Donegal, Ireland, comprising 70 sq. miles of granite, are being offered for sale. The varieties include grey of different shades, red, awarded the gold medal at the Minerals Exhibition in London, 1889, and also pink and salmon coloured. Owing to the company's willingness to sell in parts on account of its immense extent, and to the variety of colours to be had all alongside the sea, the granite offers facilities to small capitalists. The stone is of the best quality, and owing to its situation near to a good shipping port, and having a railway which is being constructed from Letterkenny to Burtonport running through the finest bed, the quarries form a very desirable investment.

Building By-laws at Bridlington.—The surveyor to the Bridlington Town Council, in his report to the committee respecting the new building by-laws, points out that "there have been several cases within the month of deviations from the plans deposited, and in one case I had to insist on a portion of a building being pulled down, as it did not correspond with the plan which was approved by the Council. In two or three other instances during the month I have had to entirely disapprove of the timbers used in some of the buildings. I have found floor joists altogether inadequate in strength put in which have had to be taken out; and I found in one building old timber put in which had been recently pulled down; in addition to the timber being unfit for use, it was inadequate in size." These delinquencies, however, do not include all. Six sheds have been erected without plans having been previously submitted; in another case a building has been occupied without a certificate of completion, and in another a builder has apparently set the Council at defiance by building two washhouses, plans for which were rejected by the Council.

Building at Leeds.—Many dwellings, including a large number of the cottage class, in Leeds are at present without tenants, and fear is being expressed that the city is overbuilt. At Armley an agent in that suburb states that he has on his books no fewer than fifty empty houses, whereas the number in normal times has not been more than twelve. Inquiries of other agents show that there are now four times the number of "to lets" that there were a year or so ago. And it is said that cottages in Armley township are from 6d. to 9d. per week cheaper than similar accommodation in the Roundhay Road and Kirkstall Road districts. In Bramley township the proportion of empties is rather larger than in Armley. A year ago new property in Bramley was let before its completion. Messrs. Yates, Ltd., of the Wellington Mills, in Broad Lane, have erected seventy-eight first-class cottages opposite their works, and these have been readily let to their own and other workers. This, it is said, has caused numerous empties amongst the poorer-class property. There are at present in Town Street and Back Lane cottages to let which have not remained empty for any length of time during the past fifteen years. At Swinnow empty houses can be seen in many streets. It is expected, however, that the extension of the tramways will have a beneficial effect in the district. In Holbeck new cottage property lets well, but regarding some parts of Hunslet and on the Bank, complaints about empty houses are to be heard.

A Year's Building at Birmingham.—The Birmingham city surveyor's annual report contains a section dealing with the building surveyor's branch department, in which it is stated that during the last twelve months there has been a considerable falling off in the number of buildings erected, as well as the number of plans deposited. This appears to be more pronounced from the fact that during the last four years, owing to the business prosperity of the city, the erection of buildings has been phenomenal. The falling off may be attributed in a great measure to the uncertainty of trade prospects, and to the increased cost of building materials (which reached its highest point about September). Consequently many building schemes have been held back upon receipt of tenders, owing to the immense cost of the undertakings. At the same time building operations have not been at a standstill, but the progress has been normal. In the year ending December 31st, 1896, plans were submitted for 1,852 houses; 1897, 1,836; 1898, 2,308; 1899, 2,145; 1900, 1,175. Although plans have only been submitted for 1,475 houses, the number does not represent the number of buildings erected, as a great many buildings for which plans were approved during the years 1896 and 1898 were not completed until this year. As a matter of fact, 1,956 buildings were erected, of which 1,630 were houses and shops. The total number of plans deposited during the year was 1,849.

London County Council.—At last week's meeting, upon a recommendation of the Housing Committee that the work of erecting some dwellings in St. Pancras should be given to the Works Department, Sir John Dickson-Poynder, M.P., moved an amendment that tenders should be invited. He said that twenty-one buildings erected by the Works Department had cost £388,863, as against a final estimate from the architect of £363,216. On the other hand, sixteen buildings had been put in the hands of contractors for £256,165, whereas the original estimate of the architect amounted to £273,680. Mr. Waterlow, chairman of the Housing Committee, said he could not dispute the figures. Contractors were now struggling to do the Council's work as cheaply as possible, so that they might wipe out the department. Under the old management there was an excess of 7 per cent., and under the new management there was an excess of 6½ per cent. That was far from satisfactory, and he could not help thinking that the department ought to be able to do the work as cheaply as the contractor. At all events, they ought to be able to do it as efficiently as the contractor. The department were now showing small savings on some of their buildings. If that were not so he should not have been disposed to hand over the new buildings in St. Pancras to the department. After discussion, the amendment was rejected, and the recommendation of the committee adopted. The Council decided to lend the Camberwell Borough Council £8,000 and the Lambeth Borough Council £20,000 to pay their shares of the cost of the extension of Brockwell Park. They also decided to ask Parliament for powers to purchase The Rookery, Clapham Common, for addition to the common. The estimated cost of purchase is £6,000. The Highways Committee submitted a lengthy report, which included proposals for the construction of new tramways of a total length of about twelve miles on the north side of the Thames, at an estimated cost of about £430,700, and for street widenings of about £185,400, a sum, however, which did not include any provision for the cost of the street widenings that would be required in connection with one of the proposed tramways. As regards the south side of the Thames, the total length of tramways was about 16½ miles. The cost of construction of the tramways, the paving of the tramway tracks, and the provision of cars, car-sheds and other works in connection with the tramways was estimated at about £591,200, and of the street widenings at about £722,100, in which sum was included the estimated cost (£29,500) of the widening of Queen's Road, Peckham. These proposals were adopted.

DUKINFIELD TOWN HALL.

THE town hall which has been built by the recently incorporated borough of Dukinfield was opened a short time ago. The cost of the new town hall is between £14.000 and £15,000. The building, which faces King Street, stands upon rising ground, and advantage has been taken of the quantity of land in that street belonging to the Corporation to set back the building line some twenty-five yards. Upon this ground flower-beds are to be laid out and a carriage drive made. The "domestic Gothic" is the style which the architects have adopted. At the entrance hall a massive porch gives access to the ground floor from a flight of steps. Above this rises a three-light window, with the arms of Dukinfield sculptured in the tympanum of the arch. Higher up is the clock chamber, and yet higher the clock and bells, and the building is surmounted with a spire. At each end of the front there is a great gable with an oriel window, and the space between these gables on either side and the central doorway is varied with buttresses and grotesque figures. The whole of the exterior is in Accrington bricks, with Yorkshire stone dressings. The upper parts of all the windows are in stained glass. In the basement, which is nearly level with the ground, there are rooms which are to be used as lamp stores, repairing-rooms, an office for the inspector of weights and measures, rooms (including bathroom) for workmen, heating chamber, fire brigade station, ambulance station and fireman's stores. The rooms on the ground floor are entered from a corridor which extends from Chapel Street end to Hope Street end. On this floor there are the gas office, meter inspector's room, the rates and water accounts office, the cashier's office, rooms for the sanitary inspector and the medical officer of health, the surveyor's offices, waiting-rooms, and School Board offices, together with a separate staircase leading to the public gallery and the Council Chamber. From this floor to the floor above there is a spacious staircase with two return flights. The arcading at the bottom of this staircase springs from red polished granite shafts and carved stone caps. On the first floor are the Council Chamber, with a panelled ceiling, the mayor's parlour, offices for the law clerks and the committee clerks, the overseers' office, cloak-rooms and two committee-rooms. All the rooms and corridors are well lighted, and the staircase is lighted by a painted glass dome in addition to the side windows. The sanitary arrangements are complete, and there are lavatories on every floor. Messrs. John Eaton, Sons & Cantrell, of Ashton-under-Lyne, were the architects, and the borough surveyor (Mr. Hague) has acted as clerk of the works.

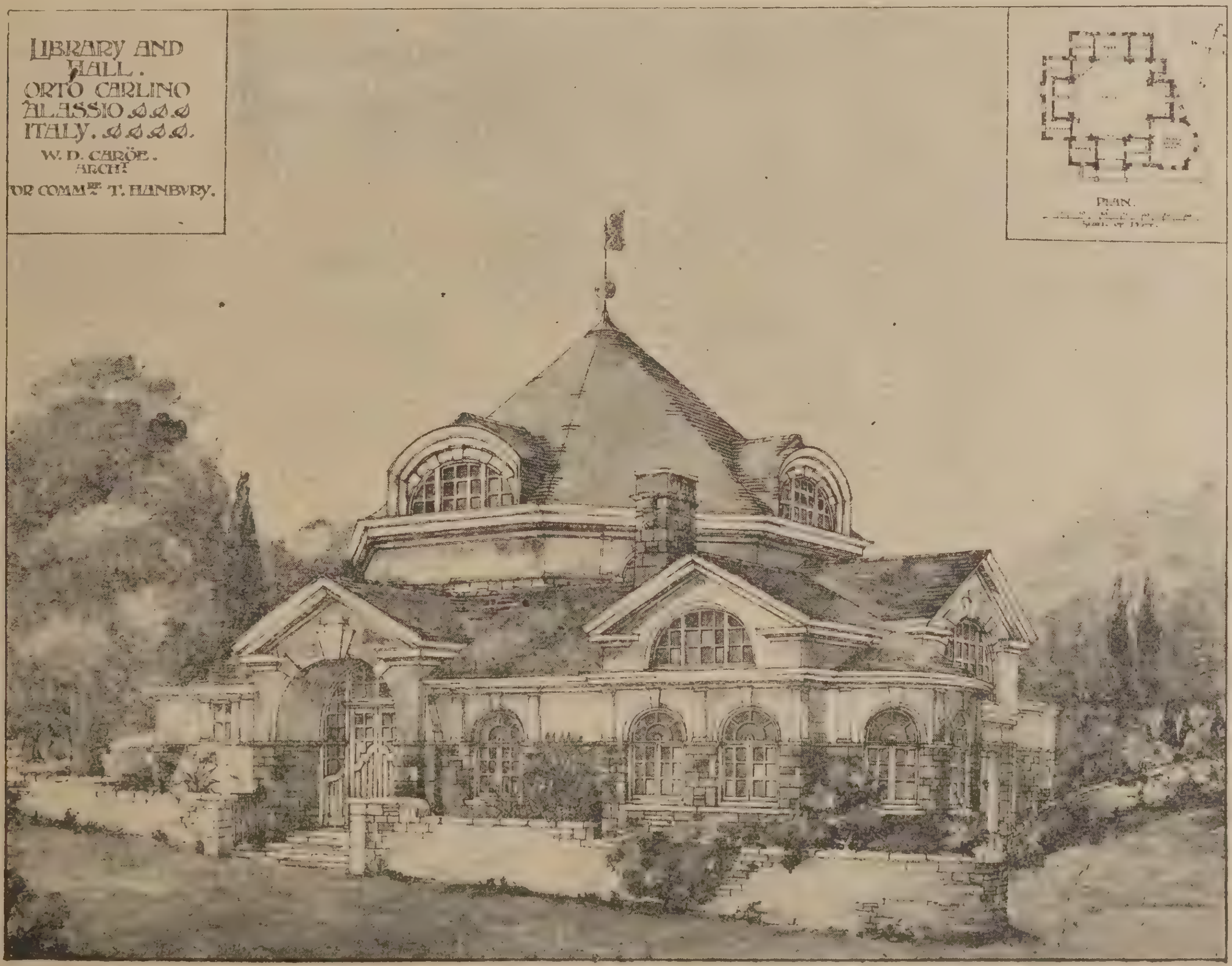
THE NEW BALTIC.

ON Tuesday in last week the Lord Mayor laid the foundation stone of a building which will, when completed, house the members of the Baltic and the Shipping Exchange. The site of the new premises is between St. Mary Axe and Bury Street, the frontage to the former place being 86ft. and the latter 72ft. The whole of the ground floor will be used for the purposes of the Exchange. Above there will be about 200 offices. The main entrance will be in St. Mary Axe, and in the basement twenty telephone boxes will be available for the use of members, and there will also be an access to Bury Street and entrance to postal and telegraph offices. Externally the front of the building facing St. Mary Axe will be in polished granite to the first-floor level, and above in Portland stone, with polished granite columns. The stone is placed on the north side of the main entrance, and is suitably inscribed. The building will contain, in addition to a large exchange, which will have a superficial area of 15,000ft., a reading room, club-rooms and arbitration-rooms, a luncheon-room, and all the accommodation necessary for the purposes of an exchange. It is anticipated there will be accommodation for at least 3,000 men.

NEW PUBLIC HALLS AND BATHS AT GLASGOW.

NEW public halls and public baths are being erected in Kinning Park, Glasgow, on sites in West Scotland Street, that of the halls at the corner of Smith Street and that of the baths almost opposite. The plans show buildings involving an expenditure of from £20,000 to £25,000. The halls have a frontage to Smith Street, showing three-light Romanesque windows over the main entrance, with minarets on each side, and truncated gable with a niche in which a representation of the Goddess of Harmony is to be placed. The principal entrance is by a flight of steps to a large vestibule, which leads through glass doors to a crush hall 65ft. by 12ft. Off the crush hall there are retiring-rooms and the stair leading to the gallery of the large hall. The hall will accommodate 1,200 persons. There will be a separate entrance to the platform from West Scotland Street, which can also be used as an entrance to the lesser halls and library. Behind the platform of the large hall there will be a four-manual hydraulic organ with full pedal compass. The lesser hall will accommodate between 400 and 500 persons. The baths will not have so many noticeable features as the halls, only the north elevation being exposed. The swimming pond is 75ft. by 37ft., being 6ft. 9in. deep at the springboard end and 3ft. 6in. at the other. The interior will be lined with white brick, and the floor and passages with Italian mosaic, having panelled borders. Over the swimming pond there will be a large gallery for spectators. Mr. Donald Bruce, of Messrs. Bruce & Hay, Glasgow, the borough surveyor, is the architect of all the buildings.

The Library at Alassio, on the Italian Riviera, illustrated on this page, was erected at the sole expense of Commandatore Thomas Hanbury, of La Mertola, and presented by him to the community. It is erected of local stone, rough-cast, and covered with local grey slates. Mr. W. D. Caröe was the architect.



Engineering Notes.

A Bridge built in a Day.—The Great Eastern Railway Company have erected an iron bridge at Wickham Market Station in a single day. Steam cranes first of all threw two girders of 15 tons each across the metals, and the whole structure, weighing 50 tons, was finished within twenty-four hours.

Electric Tramways.—The Select Committee of the House of Commons, presided over by Sir John Kennaway, last week concluded the consideration of the London United Tramways Bill and heard the case of several water companies who sought special protection for the mains from the electrolytic action of stray currents from the electricity to be generated by the promoters. A great deal of expert evidence was given, and eventually the committee declined to grant the further protection sought by the petitioners, and passed the preamble of the Bill, and ordered it to be reported.

"Conduit Wiring Erection."—This is the title of a little book by Mr. L. M. Waterhouse, A.M.I.E.E., A.M.I.C.E., published recently by Messrs. S. Rentell & Co, Ltd., 2, Exeter Street, Strand, WC., price 2s. The author explains the "Simplex" system of steel conduits for the interior wiring of electric light and power installations. This system consists of a combination of enamelled or galvanised steel tubes and malleable cast-iron fittings and accessories. The conduits are made of selected steel strip, which is passed through a tube machine: they have a perfectly smooth interior. The book savours very much of the trade catalogue of the Simplex Steel Conduit Co., Ltd., and we do not commend the author or the publisher for producing it under a misrepresentation.

Standardising Iron and Steel Sections.—A committee has recently been appointed by the Institution of Civil Engineers, with the support of the Institutions of Mechanical Engineers and Naval Architects and of the Iron and Steel Institute, to consider the advisability of standardising the various kinds of iron and steel sections, and, if found advisable, then to consider and report as to the steps which should be taken to carry such standardisation into practice. The committee is composed as follows: Mr. James Mansergh, Pres.Inst.C.E., Sir Benjamin Baker, K.C.M.G., Sir John Wolfe-Barry, K.C.B., Sir Frederick Bramwell, Sir Douglas Fox, Mr. G. Ainsworth, Mr. William Dean, Mr. A. Denny, Mr. J. Allen McDonald, Mr. E. Windsor Richards, Mr. James Riley, Professor W. C. Unwin, F.R.S., and Dr. J. H. Tudsbery (hon. secretary). Mr. Leslie F. Robinson, M.Inst.C.E., of 28, Victoria Street, S.W., has been appointed secretary to this committee, which has already commenced its work by taking evidence tendered by engineers, manufacturers and contractors upon the subject of the inquiry.

Glasgow Water Supply.—The Corporation of Glasgow, during their annual inspection of Loch Katrine Waterworks, recently opened a new supply tunnel which practically doubles the flow of water to the city. The original undertaking was constructed under an Act of Parliament passed in 1855, and was opened by Queen Victoria in October, 1859. The first aqueduct and mains cost £1,268,663, and the extensions in the city £246,907, making in all £1,515,570. In 1885 another Act was obtained to increase the supply. The first aqueduct from Loch Katrine to the service reservoir at Milngavie is 25¾ miles in length; it is 8ft. wide by 8ft. high with arched roof, and is capable of discharging 40,000,000 gallons per day. The second aqueduct, which runs almost parallel with the first all the way from the loch to the service reservoirs, is 23½ miles in length; it is 12ft. wide by 9ft. high with arched roof where not lined with concrete, and 10ft. wide by 9ft. high with arched roof where lined with concrete; and is capable of discharging 70,000,000 gallons per day. The two aqueducts, taken together, are capable of discharging 110,000,000 gallons per day into the two service reservoirs, which are distant about seven miles from the city. This quantity of water would fill a canal 30ft. wide and 6ft. deep for 19 miles. The construction of the new aqueduct has taken from March, 1886, to June, 1901, to complete, or fifteen years. The Mugdock reservoir has a water surface of 62 acres and a capacity of 500,000,000 gallons; and the Craigmaddie reservoir has a water surface of 88 acres and a capacity of 700,000,000 gallons. Combined, these reservoirs contain twenty-four days' supply at the rate of 50,000,000 gallons per day. There are four lines of 36in. pipes from Mugdock reservoir and two lines of 36in. pipes from Craigmaddie reservoir. The cost of the new works is as follows: Reservoir, £316,600; aqueduct, £730,640; outlet works and raising loch, £40,731; lands and compensation, £93,727; engineering, £31,582—total, £1,213.280. The new mains from Craigmaddie cost £116,126.

Correspondence.

South Kensington Examinations.

To the Editor of THE BUILDERS' JOURNAL.

BIRKENHEAD.

SIR,—Referring to the solutions to this year's examination questions in the Elementary Stage of Building Construction given in your issue for June 12th, in the solution to question 6 (1) the sketch does not represent this joint rightly made, as the 4in. by 4in. piece is not shown properly housed; it is a notch cut across the timber. The recess or sinking is the housing; and the whole joint, a housed and tenoned joint. The 4in. by 3in. piece should be turned flat; it is shown correctly made on the plan and section (Fig. 1).

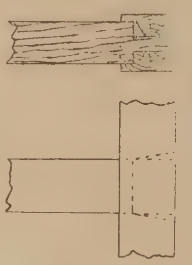


FIG. 1.

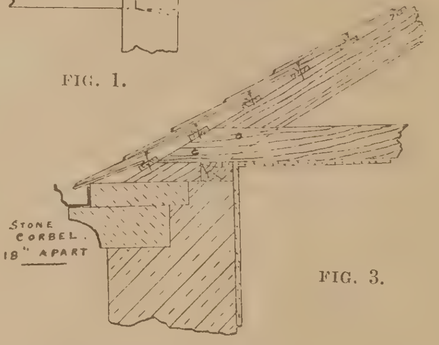


FIG. 3.

In the solution to question 8 the dotted line to represent the ends of the principal rafters is omitted from the illustration.

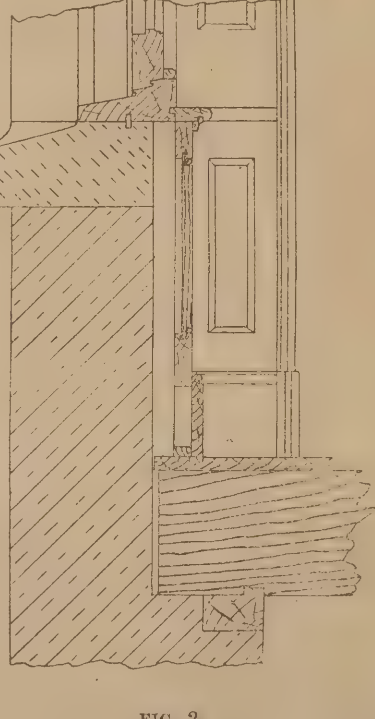


FIG. 2.

In the solution to question 9 the illustration shows the stone window sill to be about 20in. wide. This should not, nor would not, be so, as it would simply be a waste of material. There should be no 4½in. cavity between the wall of the recess and the window back, as this makes the panelled elbow and jamb-linings project into the room that distance. Also the metal tongue is omitted. The accompanying section, Fig. 2, shows these faults amended.

In the solution to question 10 some provision should be made for an eaves' spout, and, also, there is no need for the packing-piece under the ceiling joist, as they should rest upon the wall plate as shown in my section, Fig. 3.

In the solution to question 12 the walling is wrongly described as *coursed* rubble, whereas it should be described as *random* rubble built in courses, or, as generally given, built up to courses.
—Yours truly, JOHN W. HARRISON.

In regard to Mr. Harrison's intelligent criticisms, we have to say:—

Question 6 (1).—Some little latitude must be allowed in interpreting what is a "housed joint." Housing means when the whole of the end of the piece is let into the second piece: this is reasonably fulfilled in the illustration.

Question 8. The illustration would be more complete with a dotted line showing the abutment of the principal rafters.

Question 9. If this illustration is carefully examined it will be seen that the stone is dressed to have a lip inside the oak sill, and it is undoubtedly a better job than a narrow sill with a metal tongue. This small projection of the stone sill does not affect the projection of the *jamb-linings* into the room.

Questions 10. The eaves' gutter would rest upon ordinary iron brackets driven into the joint below the projecting course. As the wall plate has been laid, the ceiling joists are higher than to rest on it, and the packing-piece is consequently necessary, otherwise the weight of the ceiling would hang upon the nails. The solution shows the outside wall battened, which is not done by Mr. Harrison. It would be an improvement to show the end of the ceiling joist moderately dovetailed.

Question 12. There are certain to be some differences of definition in regard to rubble masonry, which varies in appearance with the numerous kinds of stones. The important point in the question is, of course, the order in which the stones are laid; the examiner would, no doubt, take any reasonable definition of the *class* of rubble. It must be remembered that the answer to a building question differs from an answer in arithmetic—there is more room for difference of opinion in building questions. An examiner will give more credit for an answer which is reasonably correct, and which shows direct observation and individual thought, than for a parrot-like repetition of a book answer.

Masters and Men.

The Yorkshire Master-Builders' Federation held a meeting of the executive recently, Mr. Longden (president), of Sheffield, in the chair. It was reported that the master-builders of Malton had joined the Federation, and steps were being taken to form a branch there. The meeting lasted nearly four hours, the principal subject of discussion being the Bradford dispute. The Federation unanimously decided to support Bradford and Shipley employers by every legitimate means during the dispute.

A Strike of Crieff Masons has occurred. The men desired that the agreement which had been in force with regard to the payment of 8d. an hour should be continued, but that the country allowance should be reduced from being given on three miles to being given on two miles. These terms should have come in force on the 1st June, but the masters refused to comply with them, and the operatives came out on strike. The masters offered 7½d. per hour, failing the acceptance of this, the matter to go to arbitration, and have since offered to compromise by giving 7¾d., but the men refuse to accept less than 8d. per hour. The men offer, on their part, to forego their demand as to country work.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Roof for Operating Theatre.

HOSPITAL writes: "Kindly explain the means adopted in the construction of a roof over an operating theatre, to ensure it being perfectly dust-proof and well ventilated and lighted. I enclose a sketch plan (not reproduced). What is the best kind of glass for glazing windows, lantern and underside of ceiling? Do you know of any book dealing fully with this subject?"

For reference in hospital construction, see Sir H. Burdett's "Hospitals and Asylums of the World" (B. T. Batsford, 94, High Holborn, £8 8s. nett); Sir Douglas Galton's "Healthy Hospitals" (Batsford, 8s. 6d.); Sir H. C. Burdett's "Cottage Hospitals" (Batsford, 8s. 6d.); and Sir R. Thorne-Thorne's "Hospitals for Infectious Diseases" (Batsford, 5s.) The plan given is rather an awkward shape to cover, but the best way seems to be to have an iron or steel truss (as shown at Fig. 3) across the room with half trusses (see Fig. 6) framed into it; and a slight modification of the outline as drawn will probably improve the appearance, namely, to make the ¾in. rods vertical and spread the feet of the struts to correspond. It will reduce the apparent heaviness near the junction. Fig. 1 shows frame diagram of main truss, Fig. 2 corresponding stress diagram, and Fig. 3 outlay of truss with scantlings marked. Fig. 4 shows elevation of half trusses, Fig. 5 corresponding stress diagram, and Fig. 6 elevation with scantlings marked. Fig. 7 shows the arrangement of trusses on plan. HENRY ADAMS.

New Streets.

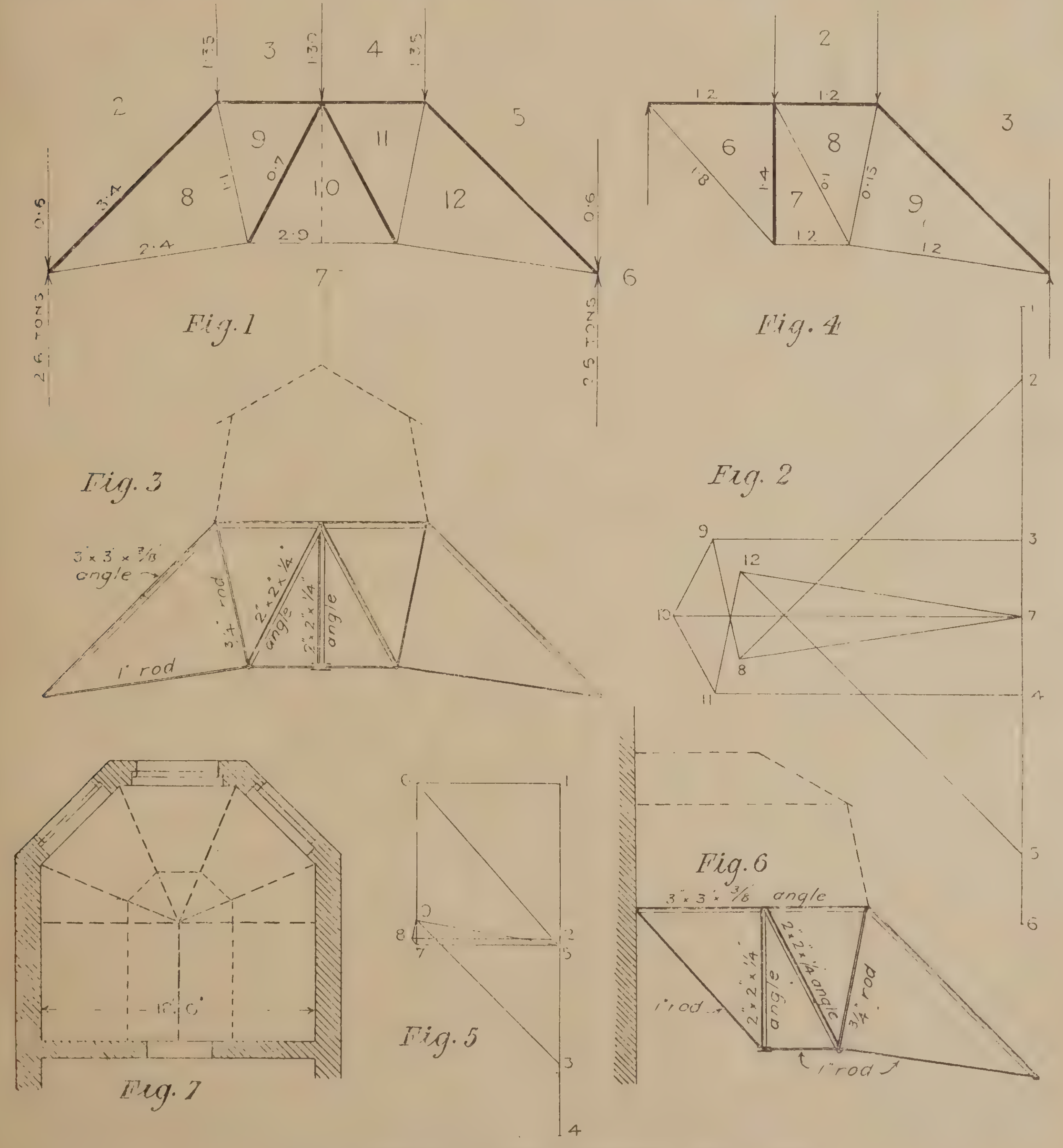
CARMARTHEN. — ONE IN DIFFICULTIES writes: "I own a field in a borough town, and in front of this field runs an old road 20ft. wide which has always been repaired by the ratepayers. I prepared plans for dwelling-houses to be built in this field, showing a 24ft. roadway in front at the required distance from the opposite side. These plans were presented to the council, but the clerk to that body ruled that they could not be built, as the building of such houses would be tantamount to the laying-out of a new street, and that the width of such new street must be 36ft., this being the specified width of all new streets according to the by-laws. What defines a new street? Was the town clerk correct in his ruling? If so, can I be compelled to give up the required 16ft. to make such new street?"

The town clerk is clearly wrong in his ruling. The best way out of the difficulty, however, seems to be to present the plans again, showing the old road 20ft. wide, but setting back the frontage line of the houses to an extent of at least 4ft., so as to leave a small forecourt. The old road cannot be converted into a new one by merely widening it. G. A. T. M.

Test for Arsenic in Wallpapers.

LONDON, S.W.—OXONIAN writes: "Is there any simple test for ascertaining whether there is arsenic in certain wallpapers?"

One of the best tests for detecting the presence of arsenic in wallpapers is as follows: Place some of the paper you wish to test in a clean flask containing some pure water, which boil; then insert some copper (which must be perfectly cleaned by dipping in strong hydrochloric acid for a second and then well washed in clean water), to which any arsenic present in the solution will at once fly, leaving a dark bluish-black iron-like stain on it. G. A. T. M.

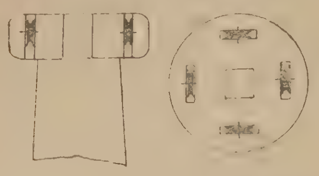


ROOF FOR OPERATING THEATRE. BY PROFESSOR HENRY ADAMS.

Flagstaffs.

NORTHAMPTON. — UNION JACK writes: "Which is the best way to fix a flagstaff; and what are the usual means for running up and lowering the flag on the gable? What wood is used for a staff from 20ft. to 30ft. in length?"

A flagstaff should consist of a carefully-selected Norway pine, free from knots and flaws, straight and well grown. It should have a diameter of from 2½in. to 3in. at the top. The method of fixing must depend largely on circumstances, but, to judge from querist's sketch, the pole may in this case be easily secured to the back of the gable by irons built into the brickwork at two or three points—the top one being as high as its proper fixing into the wall will allow. A footstep may be formed if desired by corbelling out two or three courses. Wire stays should be provided to a high pole, and in this case two such stays may be employed to anchor on to the main roof if thought necessary. The top of the pole is secured to the truck by a mortise joint, and the latter (which should be of a tough piece of flawless oak, elm or ash) is furnished with small (of 1in. or 1¼in. diameter) grooved pulleys (one for each flag it is desired to hoist) fixed vertically in slots carefully cut for their reception, and as shown on the accompanying sketch plan and section. Each slot is cut so as to just miss the staff, and the groove of the pulley is only just wide enough to take the line it is proposed to use. The halyards are not taken away when the flag is lowered, but remain on the pole, their lower ends being wound round cleats provided for the purpose. G. S. M.

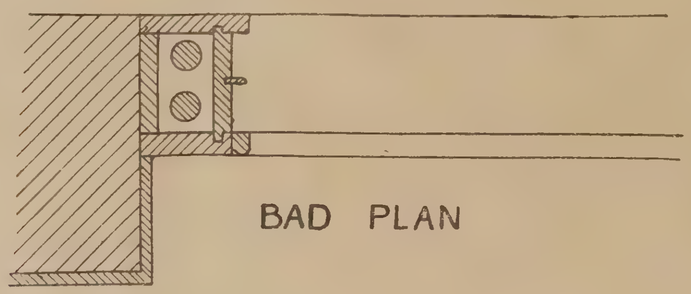


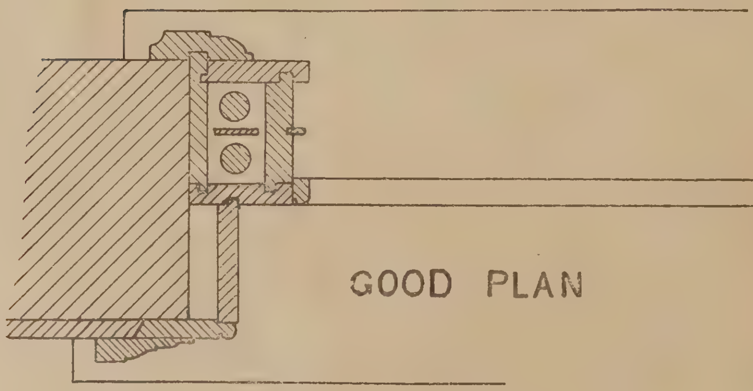
SECTION AND PLAN OF TRUCK FOR FLAGSTAFF.

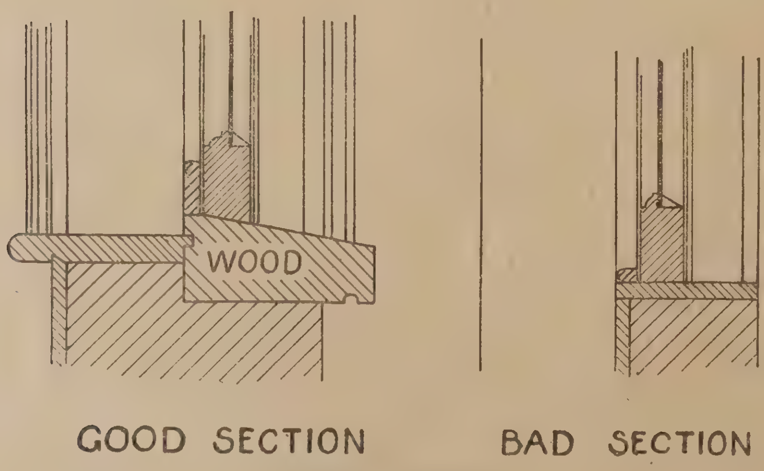
Good and Bad Frames for Windows.

LONDON, S.W.—OXONIAN writes: "Kindly show by sketches good and bad forms of window frames inserted in outside reveals flush, or nearly flush, with the brickwork. Please also state the technical name for those dark plum-coloured bricks, where they come from, and whether they are cheaper or dearer than ordinary red bricks."

The accompanying illustrations show good and bad forms of frames, both for casements and sashes. Dark plum-coloured bricks have no special technical name, beyond a description of their colour. Some of the best are made by Messrs. T. Lawrence & Co., Bracknell, Berks. G. A. T. M.







SECTIONS OF SASHES.

Measuring Lead Flashing to Chimney Stack.

BIRMINGHAM.—BRUM writes: "Kindly give the detailed dimensions which would be taken of the lead flashing to a brick chimney stack measuring, say, 5ft. up slope of roof by 2ft. 8in. It will be immaterial to me whether you assume there would be secret gutters at sides in conjunction with the stepped flashing, or whether the lead is dressed on top of the slates."

3 8
2 0 7 4 lbs. lead gutter.
Length of gutter - - 2 8
Add for ends - - 2/6in. 1 0
3 8
Width of gutter (say) - 0 6
Turn up roof („) - 1 0
Turn up wall - - 0 6
2 0

3 8
0 6 1 10 lbs. lead cover flashing.

3 8
1 0 3 8 lbs. lead apron flashing.
Length on slope - - 5 0
Add for ends - - 2/6in. 1 0
6 0

2/6 0
1 1 13 0 lbs. lead stepped flashing.

In a gutter of the length given, it is not often considered necessary to have a roll; if, however, one is shown the length of lead will be increased by 8in. for a 1½in. roll, and 10in. for a 2in. "No. 2 extra labour to bossed ends to roll" will also be required.

Granite Setts.

LONDON, E.C.—G. & G. write: "What is the usual price for granite setts for paving, kerbs and dock works, delivered either at works or f.o.b. at any British port? Also, what is the nominal measurement of setts as used in this country?"

The word "setts" has been used wrongly by our correspondents. "Setts" are squared, specially-worked, small blocks, described as 3in. by 4in. cube, or 4in. by 4in. cube, and their ordinary price is about 40s. to 45s. per ton. They are used for crossings and similar work. For roads and rougher work generally "pitchers" are used; these are not dressed so carefully as setts, and the usual sizes are about 5in. by 7in. or 3in. by 6in., by 9in. to 14in. long. The price of these is about 32s. per ton. Granite kerbs are usually 12in. by 6in. or 12in. by 8in., in pieces from 4ft. to 6ft. long, and their price is from 1s. 9d. to 2s. per ft. run. With regard to dock works, the enquiry is not clear; of course, for paving the same sizes would be used as for roads. "Spalls" are used for facing concrete blocks, being the large pieces chipped off in making the kerb. If blocks for facing dock walls are meant, the price would vary considerably with the amount of work put upon the face; the price for ordinary rough worked blocks would, however, be about 4s. per ft. cube. These prices are for Aberdeen granite on wharf in London; Norwegian, which is almost exclusively used for kerb, would be 3d. to 4d. per ft. run less. It will be understood that prices f.o.b. cannot be given in general terms, except for the ports from which the granite is shipped. As the quarries are mostly engaged in supplying all their output for shipment to the merchants, it would be somewhat futile to give the prices on ship for granite when the quotations must come through the merchants.

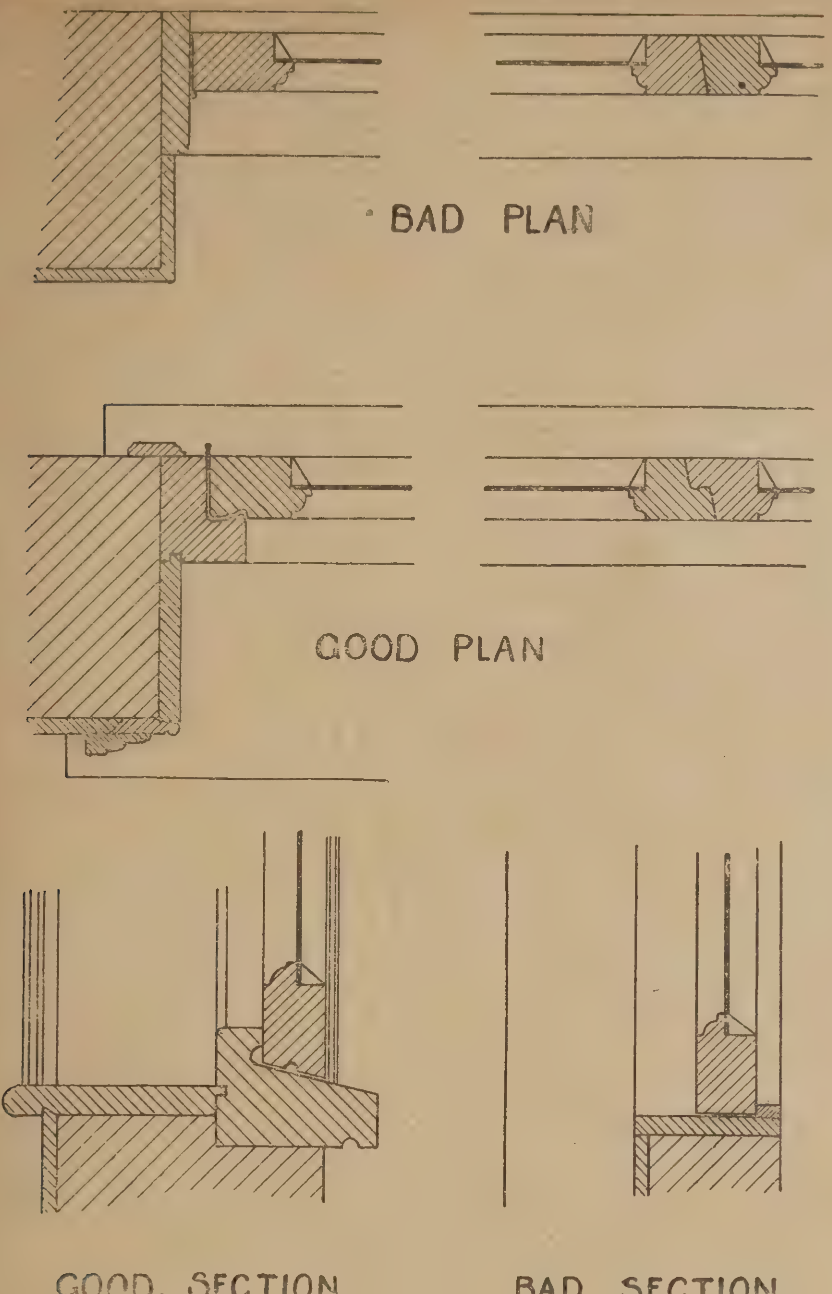
Answers to R.I.B.A. Examination Questions.

SUNDERLAND.—ENQUIRER writes: "In what numbers of the BUILDERS' JOURNAL do the answers to the R.I.B.A. examination questions for June, 1899, appear?"

The answers appeared in our issues for January 10th and 24th, 1900.

NEWCASTLE-ON-TYNE.—CLANON writes: "Kindly mention one or two books on mechanics, physics and geometrical drawing suitable to study for the R.I.B.A. examinations."

Stewart's "Lessons in Elementary Physics" (4s. 6d., Macmillan & Co.); Briggs' and Bryan's



SECTIONS OF CASEMENTS.

"Elementary Text-Book of Mechanics" (3s. 6d., W. B. Clive, 13, Booksellers' Row, Strand, W.C.); Angel's "Geometry" (Elementary Course, 1s. 6d., B. T. Batsford).

Books on Perspective, Surveying and Quantities.

EXMOUTH.—G. B. writes: "Where can I obtain books on architects' perspective, levelling and surveying, and quantities and quantity taking?"

"Architectural Perspective," by F. O. Ferguson, price 3s.; "Land Surveying and Levelling," by A. T. Walmisley, price 6s.; "Quantities and Quantity Taking," by W. E. Davis, price 3s. 6d. These can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C.

Concrete Water Tank.

BRIGHTON.—M. C. J. writes: "The concrete tank shown on the enclosed sketch (not reproduced) is intended to be built partly in the ground. It has walls 18in. thick at the top tapering to 3ft. at the base, with a bottom 2ft thick. (1) Are walls thick enough? (2) Should I have more than one cross wall? (3) Will a steel joist and concrete roof tend to throw out the walls, and if so, what method should I adopt to prevent such thrusting? (4) I purpose to use for the concrete, 3 parts of beach shingle, 2 of pit sand, and 1 of best quality cement: turned twice dry and twice wet. Can I better this? The walls and bottom will be rendered inside with 2 of sand to 1 of cement. (5) Are there any reference books for this kind of work?"

(1) Yes. (2) There is no necessity to have more than one cross wall. (3) Practically none. (4) The proportions named are good. They are often much inferior, shingle and cement alone being used in some cases. The walls and bottom, if they are to be watertight, must be left with a trowelled face and not floated, as ordinarily. There is no necessity for the iron rods at angles if the concrete is homogeneous and the bank of earth goes right round. This earth should be somewhat well tamped. (5) Rivington's "Notes on Building Construction," Vol. IV., gives the method of calculating the thickness of the walls and other particulars are given in another volume. Ransome's "Manual of Civil Engineering" and Tudsbery and Brightmore's "Waterworks Engineering" will also be found useful.

Use of Tufa in Buildings.

LONDON, S.E.—H. S. writes: "Referring to my previous query and the reply on p. 286 of your issue for May 15th, I am uncertain how to apply the information you give to the particular case. The building in question is St. Botolph's, Northfleet. I have been endeavouring to trace the earliest records of its erection, and wish to ascertain whether the use of a piece of tufa is any criterion as to the existence of an earlier building. From the information you have given me, I infer (perhaps wrongly) that a building may have been erected on the same site by the Romans, as they were accustomed to the use of the material mentioned."

We do not think you can argue much from the presence of a block of tufa in St. Botolph's, Northfleet. Our allusion to Rome in the previous answer was merely general, and it is quite wrong to infer that the Romans would take the trouble to search for tufa and bring it from a distance because it was used in the early buildings of Rome. The Romans knew how to work a finer-textured stone, and preferred it when they could get it, as is abundantly testified in their important buildings; indeed, they generally covered up the tufa, using it in foundations, &c. In civil buildings and engineering works in their provinces they mostly erected concrete structures, and it would, perhaps, argue something if this were found in an old building. The block of tufa (assuming that it is tufa) in St. Botolph's would appear to come from some distance, for we do not know of any of this stone being in the county. A geologist might be able to locate the place it came from by examination, but it might have been built in by anyone. Its weathering and working may give some evidence of its date.

Rural Building By-laws.

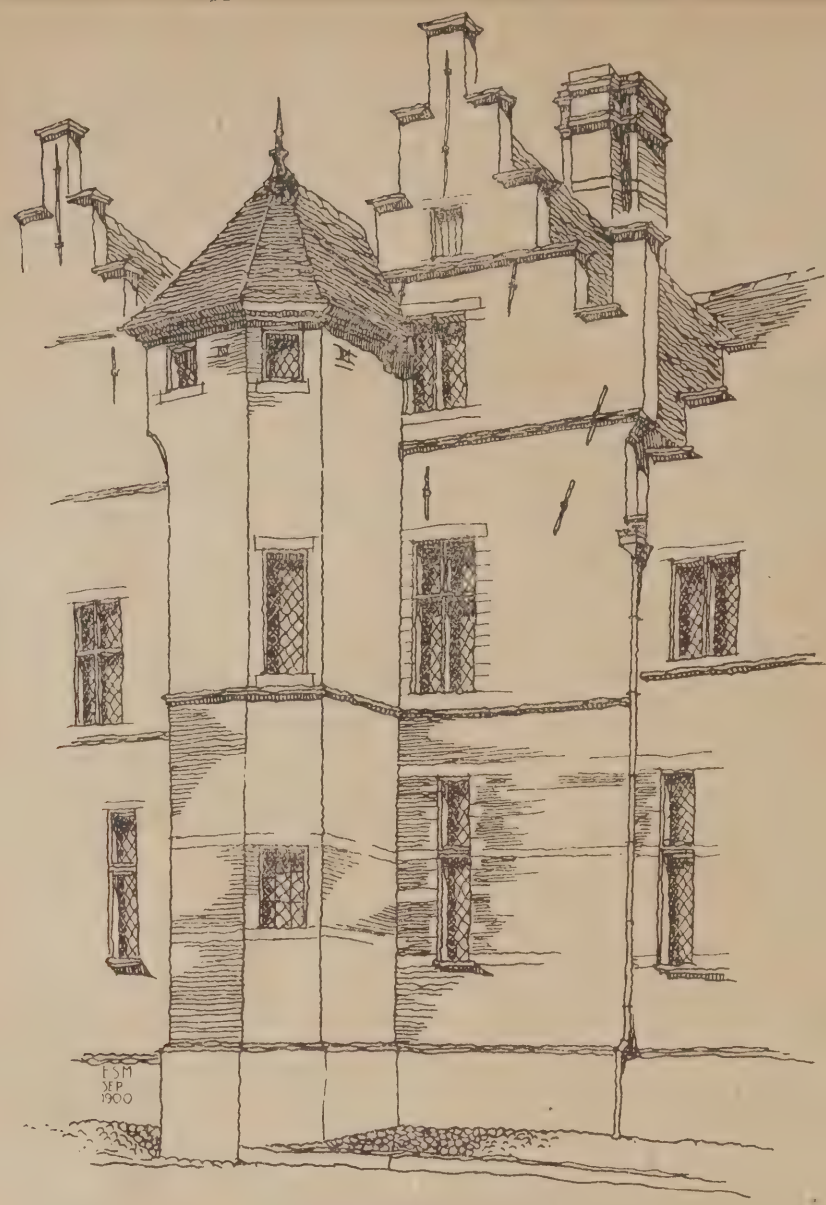
SCARBOROUGH.—H. M. C. writes: "Have any building by-laws for any rural districts been framed by any society, or have any books or articles been written on the subject?"

The matter has received the attention of the architectural societies for some time past; and, as the result of representations made to the Local Government Board, a revised series of by-laws for rural districts is at present being drawn up.

EXTENSION OF MONTROSE ASYLUM.

A NEW villa has just been completed on the Sunnyside Asylum grounds, Montrose. The building is situated at the back of the main block which originally formed the entire asylum, and is constructed so as to accommodate sixty inmate—males of the quiet, convalescent class, It is a substantial stone building of three storeys, the ground floor consisting of dayrooms, kitchen, bootroom and lavatories, while the upper floors are occupied by dormitories and bathroom. The first floor consists of three dormitories, a small one in the centre with six beds, and two larger ones on the east and west sides, each with twelve beds. On this floor over the lavatories and bootroom is a bathroom, with dressing-room and lavatory accommodation. The second floor has also three dormitories, containing in all thirty beds, and is exactly similar to the floor below minus the bathroom. The total cost of the villa with furnishings amounts to less than £115 per bed. The following had charge of the building during its construction: Architect, Mr. J. Sim, C.E., Montrose; plasterers, Mr. Archibald M. White & Son, Largo; joiners, Messrs. Fettis & Stephen, Montrose; plumbers, Messrs. C. Wood & Co., Montrose; plasterers and tilers, Messrs. Burness & Son, Montrose; slaters, Messrs. Brand & Son, Arbroath; heating and engineers, Mr. Robert Tindal, Aberdeen; electricians, Mr. James Maxwell & Son, Dundee; clerk of works, Mr. W. C. Orckney, Asylum. A lodge has been erected at the entrance from the road to Carnegie House, a building which was completed about two years ago, and erected for the purpose of accommodating private patients. The contractors for the lodge were: Builders, Messrs. Archibald M. White & Son, Largo; joiners, Messrs. John Raitt, Montrose; slaters, Messrs. John Wishart, Cauldhame, and Messrs. Lindsay & Son, Montrose; plasterer, Mr. James Bowman; plumber, Mr. J. L. Warden.

The Little Parc Monceau, on the northern heights of Paris, is becoming a rival in the way of statuary to the garden of the Luxembourg. Monuments of Maupassant and Ambroise Thomas, the composer of "Mignon," are already placed there, and before long statues of Gounod and Pailleron, author of "Le Mond où l'on s'ennuie," will be erected in the park.



PALAIS DE JUSTICE, MALINES.

Surveying and Sanitary Notes.

A New City Road.—The proposal to make a new road between West Smithfield and Cripplegate was discussed at a recent meeting of the City Corporation. An objection was raised that the cost, £872,000, was too heavy, but it was decided to print the committee's report.

New Open Space at Camberwell.—The Leyton Square public garden was opened recently. The ground is situated in a densely populated district near the Old Kent Road. The acquisition of the square as a public garden was suggested as far back as 1897, and the freehold was eventually acquired for £3,000, one-half of which was contributed by the London County Council and the remainder by the Camberwell Vestry. The grounds have been laid out by the Metropolitan Public Gardens Association at an approximate cost of £600.

Blackpool Promenade Widening.—A start on the widening of the Promenade at Blackpool is to be made as soon as the season is over. The current year's estimates allow for an expenditure of £60,000, and the surveyor, Mr. Brodie, contemplates spending £15,000 per month during the winter. South of the Victoria Pier a widened promenade has already been made, and this will be continued northward, but whether this will be 60ft. or 100ft. wide has not been settled, though the original idea when Parliamentary powers were obtained was that it should be 60ft., and the estimated cost is £300,000. It is now claimed, however, that for a little extra expenditure the 100ft. could be secured. The slope of the hulking has not yet been determined, though it will be constructed on basaltic stone, a large quantity of which has already arrived. The new promenade will have a double tramway along the whole length, but it is expected to take about four or five years to complete.

Roads Improvement Association.—At the council meeting of this association recently it was resolved to proceed with the objections to the Middlesex light railway scheme before the Board of Trade with a view to securing that the roads along which it is intended to lay the light railway should be widened to a greater extent than is proposed, and the insertion of safeguards for the efficient up-keep of the surface of the roads. It was also resolved to move certain amendments to the Light Railway Bill now before the House of Commons, with a view of more adequately protecting the interests of the general body of road-users. The report of the Royal Commission on Local Taxation was considered, and the following resolution unanimously adopted: "That the council of the Roads Improvement Association cordially approves of the recommendations of the Royal Commission on Local Taxation that one-half of the cost of main roads in England and Wales shall be borne by the State, provided that the Imperial grant shall be made dependent on compliance with conditions designed to secure efficiency, and trusts that His Majesty's Government will give effect to the recommendation at an early date."

Adams's Patent Sewage Lift.—Some sewage lifts at Broadway, Douglas, Isle of Man, were tested recently by the borough surveyor, Mr. A. E. Prescott in the presence of Mr. S. H. Adams, of New York, the inventor of the lift. These lifts are intended to raise the low level sewage into the high level sewer on the Crescent Road. The lift is worked by falling sewage from the high level district coming from Victoria Road, Upper Broadway, and Upper Derby Road districts, which discharges into an air chamber, thus displacing the air which is already encased in two large iron cylinders some 17ft. 6in. long and 2ft. 6in. in diameter. The air is forced from these cylinders, and travels through 3in. diameter air mains, which are connected with the cylinders in the chamber, the cylinders being filled with sewage from the low level sewers 12in. in diameter. The air is forced into these cylinders, thereby ejecting the sewage through 10in. diameter rising mains into the ejector chamber, and thence through the high level gravitation sewer. The capacities of the cylinders are 400 gallons each, and when the duplicate apparatus is at work it is capable of lifting 8,000 gallons per hour. The test proved very satisfactory, water being lifted to a vertical height of 6ft. into the high level sewer. Now that the test has been found satisfactory, the borough surveyor intends to complete the house connections immediately on the high level, and also turn in the sewage from the top districts, namely, Derby Road and Upper Broadway. Four lifts are proposed to be eventually constructed at a total cost of about £3,500.

SKETCHES IN BELGIUM.

By E. STANLEY MITTON.

No country of an equivalent size appeals more forcibly to the antiquary, artist or architectural student than Belgium, with its many old buildings, picturesque "bits," and useful details. Another and important consideration to the man who cannot afford much time and expense in travelling is that these fragments can be gathered frequently and easily from buildings closely grouped together. The travelling is so cheap that one can go there and back, say for thirty days, for about £12, including railway expenses, hotels, &c. English is spoken nearly everywhere.

The Béguinage—which forms the subject of one of the accompanying illustrations—was founded in the thirteenth century, and is at the south-west end of the old town of Bruges. The low whitewashed houses surround a court shaded by lofty trees. The church is of fairly plain design, and was erected in 1245 and rebuilt in 1605. Of all the cities of Belgium, Bruges has best preserved its mediæval characteristics. Except the quarter between the large market place and the railway station, the town now presents a dull and deserted appearance. Nearly one-fourth of the 48,200 inhabitants are said to be paupers. The city was long the residence of the court of Flanders. It reached the culminating point of its prosperity during the first half of the thirteenth century, when the Dukes of Burgundy held their court there. During this period a brilliant colony of artists was retained at Bruges in busy employment, and their works still shed a lustre on the name of the city.

The ancient town of Malines, notwithstanding its broad and regular streets, handsome squares and fine buildings, is a dull place, and totally destitute of the brisk traffic which enlivens most of the principal Belgian towns.

The quietness of the town forms a strong contrast to the busy scenes at the station, which is the focus of several of the important railways in Belgium. The cathedral of St. Rombold is of course the principal sight to be seen; the grand tower, with its large clock, was begun at the end of the twelfth century and completed about 1300. The face of the clock is 49ft. in diameter. The Palais de Justice, or rather Tribunal (a sketch of one of the entrances was published on page 247 of the Builders' Journal for May 1st last), consists of a picturesque assemblage of buildings built in brick and stone. The building has been skilfully restored by Blomme of Antwerp, and contains some fine chimneypieces and other interesting works of art.

Views & Reviews.

A Stupendous Muddle.

The Workmen's Compensation Act of 1897 has proved to be one of the most incongruous of our enactments, and for this reason it has justly been attacked innumerable times both by laymen and by judges of high repute. This book is an addition to the literature on the subject, but it differs from others in being an attempt to look at the matter from the business man's point of view, not pretending to deal with it from the legal standpoint. It is a plea for the revision of the Act. The author says: "Of course, it was expected that there would be a certain amount of litigation before the Act was found workable, but it was never anticipated that there would have been so many litigious points raised, and so much ambiguity as to the meaning of the various sections." As Deputy Judge Pitt-Lewis said: "The draughtsman of the Act had left the judges to guess at what was meant." Under a sketch by "F. C. G.," that clever satirist, appeared the following: Workman (minus a leg): "What happened to me? Scaffolding gave way and I fell off the top of the house. Compensation, I didn't get a ha'porth—the lawyers said as how I didn't come within the Act, because the building was only 29ft. 11in. high." Workman (with crippled arm): "That's bad luck. I only fell a matter of 15ft., but I got £100 at last, after the lawyers had tried it three times. How was that? Well, they found the buildin' was just 30ft. 6in. high, and that brought me inside the Act, so they said. It's a rum Act, ain't it? There's poor Jack Hodge being buried to-day. He was killed on Mr. Smith's farm, and his widow don't get a farthing! How's that? Well, you see, he was only a agricultural labourer, and they don't count, according to the Act." This homely illustration could not be improved upon: it typifies the Act exactly. But the chief interest of this book is the plea for revision. It is undeniably apparent that the statute needs to be revised, both in the interest of employers and employed. "Whilst it is true that a large number of legal decisions have been obtained which, on the whole, tend to limit the liability of the employer, yet the fact remains that in nine cases out of ten the master never knows whether he is liable or not to pay compensation. . . . . What is the position of the workman under the Act? Originally it was thought that his position was an assured one, and that, provided that he was not guilty of wilful misconduct, he would receive half his weekly wages after the first fortnight, so long as the disability continued. At the present time, his position is very uncertain. . . . . Viewing the subject from the standpoint of the insurance companies, there is abundant evidence to prove that a thorough revision is necessary in order that rates may be put upon a satisfactory foundation. . . . . What is required is the sweeping away of all useless restrictions, and the enforcement of a measure embodying the principle of compensation for all accidents of occupation. But, in order to be acceptable to the employer, the scheme should be clear and simple in its wording, and the compensation should be limited in extent. . . . . What is wanted is rather to set things upon a purely business basis, with less dependence upon the lawyers." This is the case for revision, and we do not think it can be confuted. The Act—an experiment—has been tried and found wanting, and the sooner it is revised the better for all whom it affects.

"The Workmen's Compensation Act, 1897." By R. T. Thomson. London: Effingham Wilson, 11, Royal Exchange. Price 2s. 6d. nett.

English Cathedrals.

This little work is an itinery of the English cathedrals for the use of travellers. As originally written by Dr. Gilchrist, of Iowa University, U.S.A., it was intended especially for visitors from the United States; but with the idea that it would be equally useful to English tourists, as a companion to their "Cathedral Series" the publishers (Messrs. George Bell & Sons) placed the manuscript in the hands of the Rev. T. Perkins, rector of Turnworth, Blandford, and he has added at the head of each chapter a brief synopsis of the ecclesiastical character and architectural features of each cathedral church, and at the end has inserted the names of other buildings in the neighbourhood worth visiting: but the criticisms in general are wrong. The order taken begins with Liverpool, where the American tourist lands, and a complete circuit is made back again there. A useful map showing the position of the cathedral churches and a table of their comparative dimensions are given at the end of the book. The introductory chapter dealing with the architecture of the cathedrals is necessarily very brief and superficial, being intended to interest the general reader; still a section or two and some details showing the wonderful and logical methods of construction employed by the builders, and the orderly development of the architecture, might have been added to enhance the educative value of the book. The remarks respecting restoration are to the point, and we are glad to see every opportunity taken to dissipate the crass ignorance and almost criminal interference displayed by many clergymen and most laymen with regard to this matter. Altogether, the book is very ably produced, and should prove most useful to those for whom it is intended. We may remark that the price of Bell's "Cathedral Series" is now 1s. 6d. nett per volume, and of the "Handbooks to Continental Churches" 2s. 6d. per volume.

"An Itinery of the English Cathedrals for the Use of Travellers," compiled by James G. Gilchrist, A.M., M.D. Revised and edited, with an introduction on Cathedral Architecture, by the Rev. T. Perkins, M.A., F.R.A.S.; price 1s. 6d. nett. London: George Bell & Sons.

Whitstable.

This is the latest addition to Mr. Millgate's series of Kentish guides. In the author's words: "The architect and antiquary, although seeing perhaps little to interest them in the town, will find it a capital centre from which to visit some of the ancient buildings and churches which are scattered over the surrounding country"—such as Canterbury; Blean Church; Graveney Church; Hern Church; the ruins of St. Mary's Reculver; 'Tankerton Tower, the manorial residence of Whitstable, which has suffered much abuse at divers hands; All Saints' Church, dating from the end of the fifteenth century, but the object of "restorations" in 1846 and 1873–5; and old Seasalter Church, which was dismantled about 1844, in order that a "jumble of nearly all the stages of Gothic architecture" might arise. The iconoclast and the restorer have done great havoc among the quaint old churches of Kent, but this guide-book will be found of much interest to those visiting them.

"Guide to Whitstable." Published by W. F. Millgate, 21, Mortimer Street, Herne Bay, Kent; price 6d. Illustrated by B. O. Dexter and Frank Hart.

Scottish Ecclesiastical Architecture.

This small book upon Scottish cathedrals and abbeys is a very welcome addition to the series of books that have been published recently on the ecclesiastical architecture of England, Scotland, Wales and Ireland. Being only a small book, it is not, of course, to be compared with Messrs. MacGibbon and Ross's "Ecclesiastical Architecture of Scotland," but it serves a useful purpose in giving in a handy form a short survey of all the important buildings. An introduction to the book has been written by the Very Rev. R. Herbert Story, Principal of the University of Glasgow; and he, like the Rev. D. Butler, is solely concerned in his review with the general impressiveness of the buildings upon their archæological, historical and spiritual side, and he merely looks at the outside skin, as it were, and less at the muscle and bones of these old buildings. To architects the latter are, of course, the most important. The author carefully takes the various cathedrals, collegiate and parish churches, and monasteries in sections, and deals with each building separately. At the end there is a very useful general survey of Scottish mediæval architecture, being a list of buildings arranged under the heads of periods, a classification of some utility.

"Scottish Cathedrals and Abbeys." By Rev. D. Butler, M.A.; with an introduction by the Very Rev. R. Herbert Story, D.D., LL.D. London: Messrs. A. & C. Black, Soho Square, W.; price 1s. 6d. nett.

A COTTAGE IN THE BÉGUINAGE, BRUGES.

Law Cases.

Damages for Breach of Contract.—The case of *Drever* v. *Martin* was heard recently at the Northampton Assizes. This was a claim for work done and for damages for breach of contract at Kettering. The case of the plaintiff (a builder and contractor) was that the defendant was anxious to erect an arcade out of Gold Street, Kettering, on the site of a furniture shop and some old buildings. He spoke to the plaintiff, who drew out a rough sketch for an arcade. Ultimately, it was settled that the arcade should be built by the plaintiff according to plans to be produced by Mr. F. A. Palmer, architect, acting for the defendant. It was further arranged that the plaintiff should be the builder, and because there was a lot of material on the site it was considered best that there should be no tendering. The defendant promised to find all the material, the plaintiff was to do the building, and he was to have from the defendant, as his commission, 5 per cent. on the total outlay. All this was embodied in an agreement executed by the parties on December 14th, 1899. Mr. Palmer produced plans which the plaintiff estimated would cost £9,000. Owing to the plans having to be sanctioned by the Local Government Board, there was some delay in starting; plaintiff employed extra men to clear up his own work in order to begin on the defendant's work at the end of January or beginning of February, 1900. The defendant, however, in the end declined to have the work done at all. Plaintiff claimed damages £600, of which £136 was in respect of profit he would have made on the wages of three apprentices, and £150 for loss on purchase of extra plant and engaging extra workmen for the purpose of building the arcade. The jury found a verdict for the plaintiff, damages £25. Judgment accordingly, with costs.

The Repair of Bridges.—The case of the *Attorney-General* v. *Berkshire County Council* was recently heard in the Chancery Division of the High Court of Justice. This was an action in which the Cookham Rural District Council, who were also plaintiffs, sought to have it declared that the defendant council were liable to repair two bridges called Sell's Bridge and Crockford Bridge, in the parish of Waltham St. Lawrence, in the county of Berks. Mr. Justice Buckley, in his judgment, said that under the Statute of Bridges, passed in the reign of Henry VIII., the county was *prima facie* bound to repair bridges. An Act passed in 1803 provided that bridges thereafter built were not to be repaired at the expense of the county unless constructed to the satisfaction of the county surveyor. No evidence of the approval of the surveyor was forthcoming, but the plaintiffs said both bridges had been built before 1803. They had evidently been built about the same time, and on one of them there was a tablet bearing a date in the eighteenth century. Both bridges also appeared in a plan dated in 1815, and it seemed plain that both of them were built before 1803. The onus, therefore, lay on the defendants to prove that repairs had been executed by immemorial custom by someone else. There was no evidence that the county had ever repaired either bridge, and there was evidence that the parish had in and since 1869 occasionally spent small sums in repairs of the bridges. But that was not enough to show an immemorial custom; and there must be a declaration that the defendant council were liable to repair the bridges, and they must pay the costs of the action.

Signboards.—Mr. C. E. Hewlitt, an auctioneer's clerk, was passing certain premises in Leicester Square when an advertising signboard fell upon his head from a height of 60ft. He sustained a fractured skull, the vision of one eye was impaired, and there was a possibility that he might lose his sight. In the King's Bench Division last Wednesday he sued for damages for negligence. Defendants pleaded that the accident was the "act of God," as it was caused by an exceptionally high wind. The jury returned a verdict in favour of Mr. Hewlitt for £650 against the landlord only, but judgment was reserved for consideration on a point of law.

London Main Drainage.—The case of the *London County Council* v. *Board of Works for Lee District* came before the House of Lords on Thursday last. This was an appeal from an order of the Court of Appeal dismissing an appeal from a judgment of the Divisional Court. On the part of the respondents an application was made for a mandamus directing the County Council to carry out certain works in connection with the drainage at Charlton, in Kent. It appeared that the area in question, which was on the bank of the Thames, was below the level of the Trinity High-water Mark. It depended for its main drainage on the County Council's main southern outfall sewer, with which the local sewers vested in the respondents were necessarily connected, and it was said that the level at which this main sewer ran and its size was such as to render the efficiency of the drainage of the low-lying land by its means impossible. When the matter came before a Divisional Court, Mr. Justice Grantham was of opinion that the mandamus should go, and Mr. Justice Kennedy, who differed, withdrew his judgment as junior judge, with the result that judgment was given for the respondents, and this decision was affirmed by the Court of Appeal. Hence the present appeal. Mr. Cripps (for the appellants) said that, having regard to the views expressed by their lordships, there had been a consultation between Sir Alexander Binnie and his clients, with the result that a statement had been prepared which he believed was acceptable to Mr. Lawson Walton (counsel for the respondents). Sir A. Binnie's report, as adopted by the Council in 1899, was in process of being carried out, the scheme being practically that designed by Sir Benjamin Baker and Sir Alexander Binnie as the best means, under all the circumstances, of dealing with the sewage of London south of the Thames and preventing local floodings. Mr. Lawson Walton assenting to this view, the Lord Chancellor said that the result would be that the appeal would be allowed.

AT BRUGES.

House Owners and Road Repair.—On Thursday last in the King's Bench Division a Mr. Constad, owner of forty-eight houses in Chester Road, Edmonton, recovered £50 damages from the Edmonton Urban District Council. The Council, it appeared, placed notices on twelve of Mr. Constad's houses to the effect that any person living in the houses would be liable to a penalty of £5 a day. This, Mr. Constad said, had hindered the letting of the houses. The Council urged that the houses could not be let owing to the state of the road. They further sought to justify their action under a private Act of 1898. Their case, as indicated above, failed.

A Claim for Seats and Pews.—At the Essex Summer Assizes recently Charles E. Orfeur, builder and joinery manufacturer, of Colchester, brought an action against Messrs. Newman, Ltd., builders, of Norwood, to recover a sum of £145 for work done. The plaintiff arranged, at a cost of £245, to make for the defendants seats and pews for a new chapel at Harringay. These the plaintiff agreed to supply ready for fixing. He completed his contract before any payment was received from the defendants, although they stipulated to pay the plaintiff as the goods were delivered. No complaint was made as to the character of the seats supplied before they were finished and delivered; it was only after the plaintiff had several times

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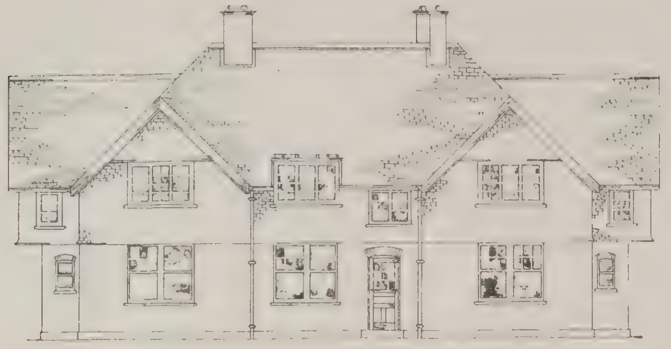
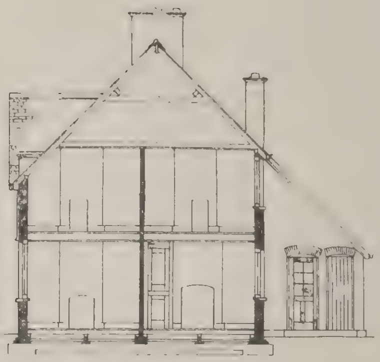


FRONT ELEVATION.



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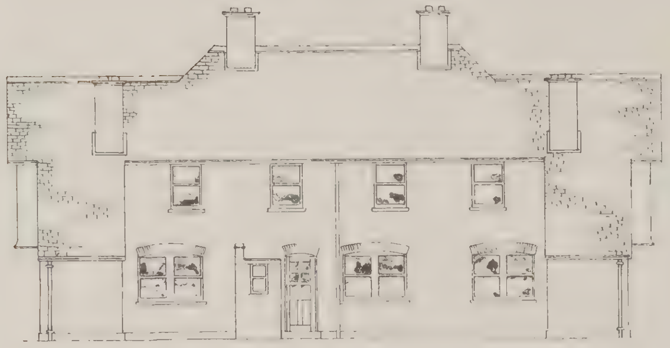
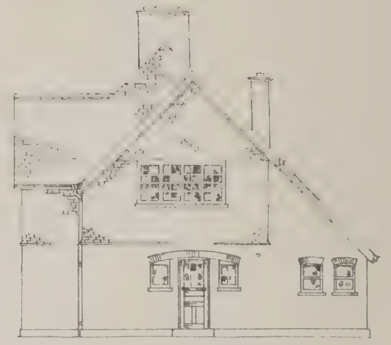
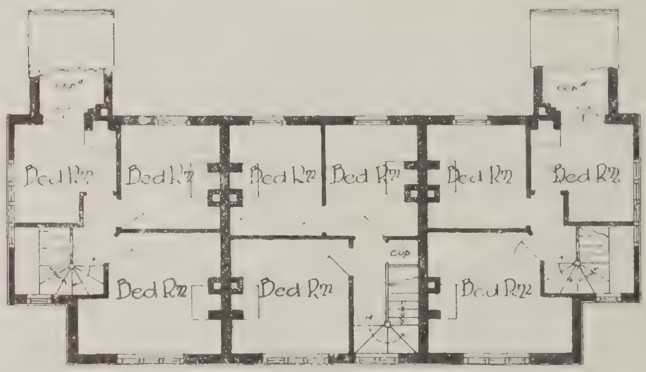


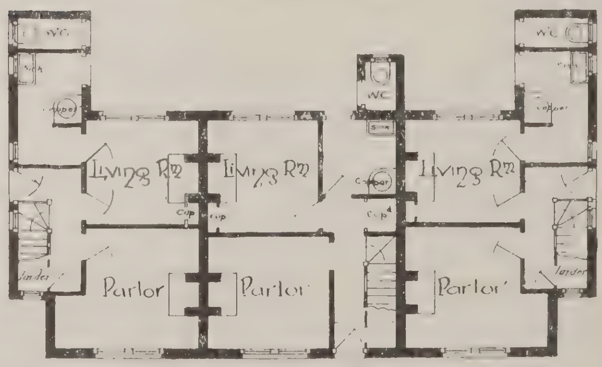
BACK ELEVATION.



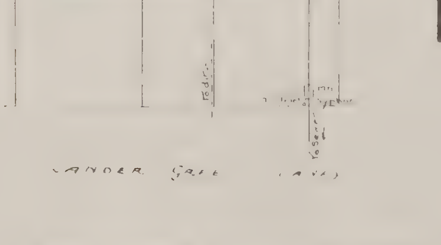
SIDE ELEVATION.



FIRST-FLOOR PLAN.



GROUND-FLOOR PLAN.



THREE COTTAGES, PARK FARM, NORTH CHEAM, SURREY. H. D. SEARLES WOOD, F.R.I.B.A., Architect.

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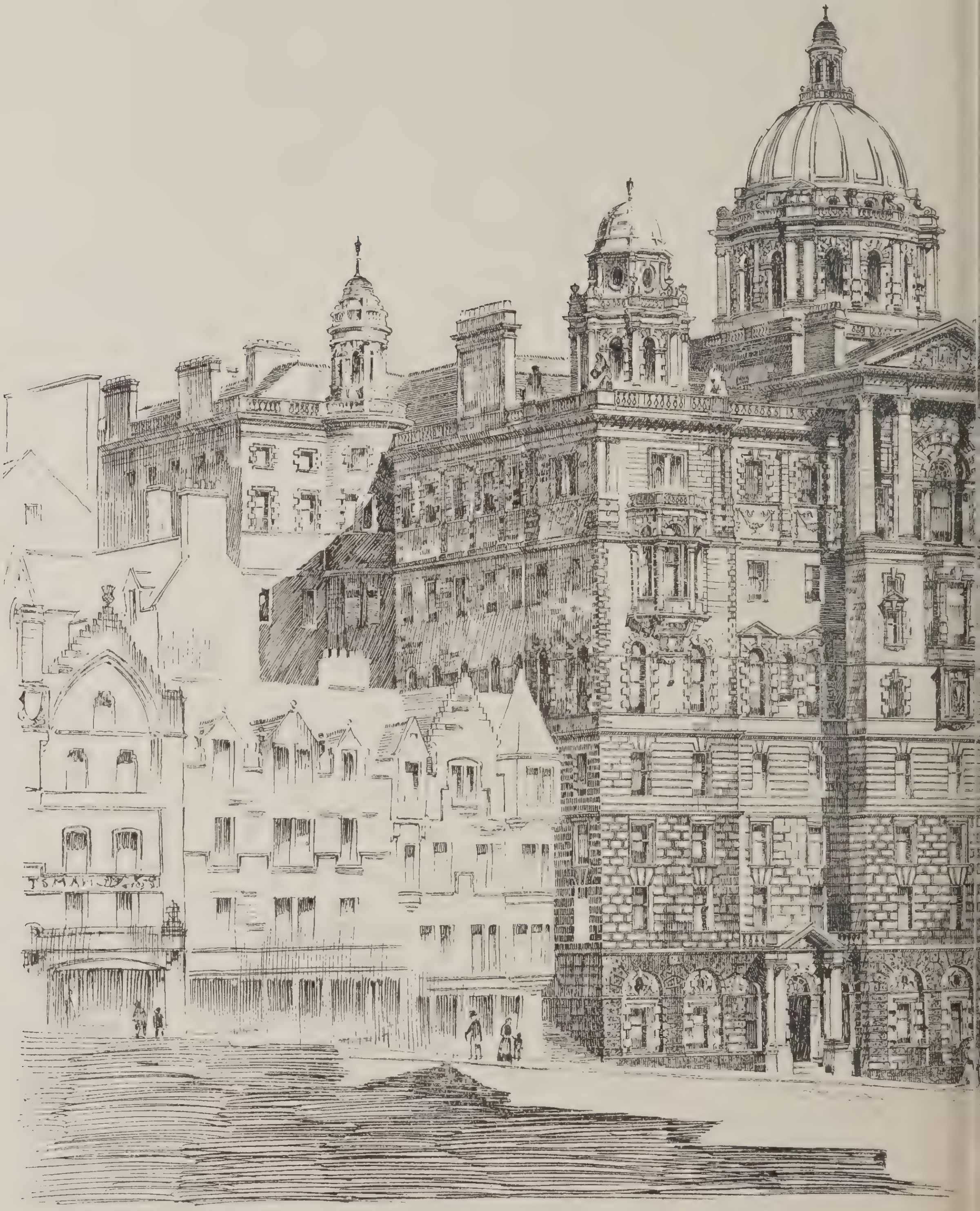
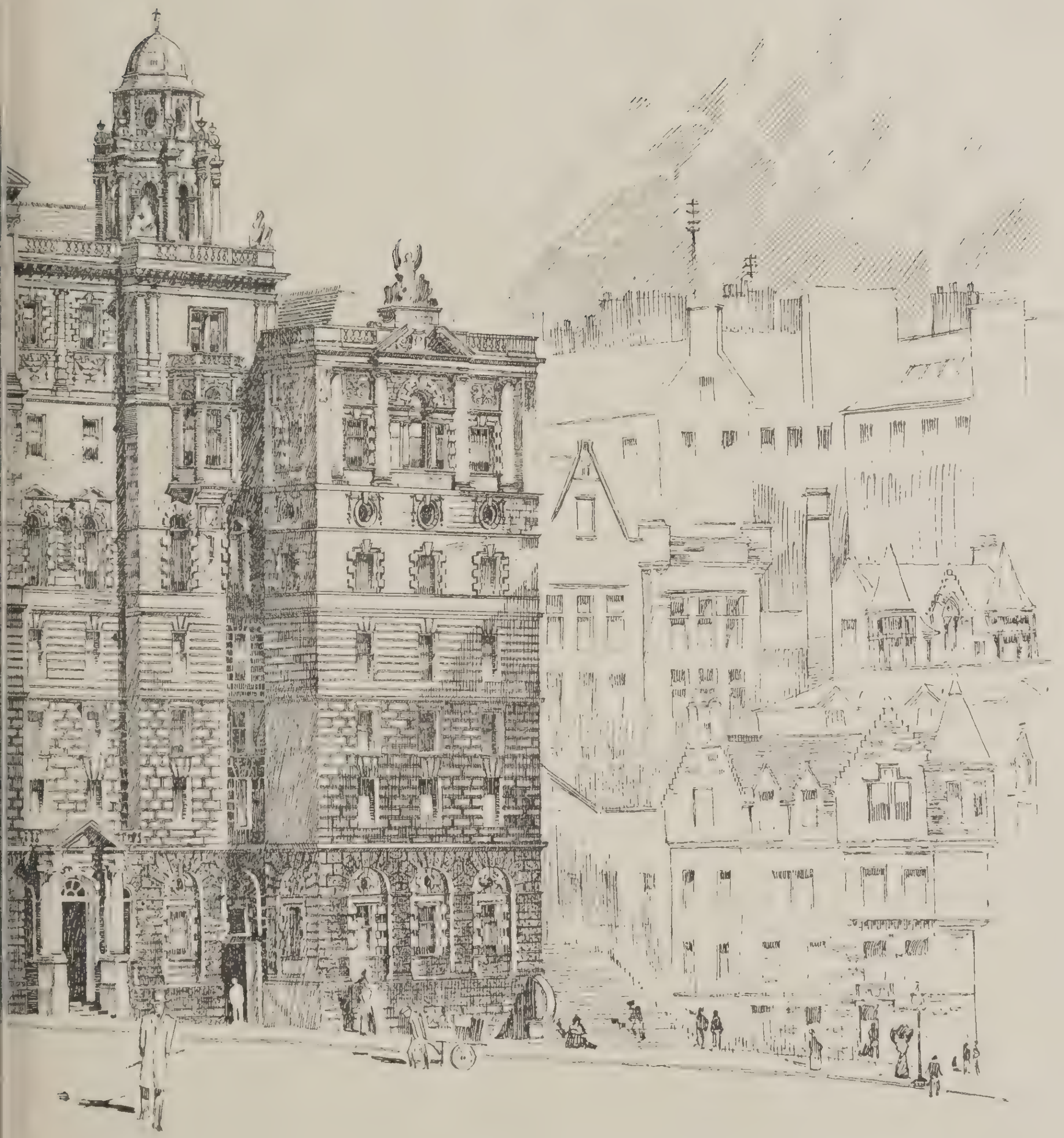


EDINBURGH CITY CHAMBERS (MUNICIPAL BUILDINGS), A

R. Morham, City Superin



W BEING EXTENDED : VIEW FROM THE NORTH-EAST.

t of Works, Architect.

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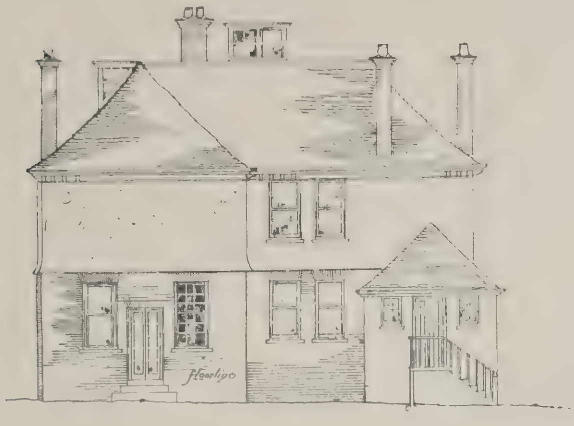
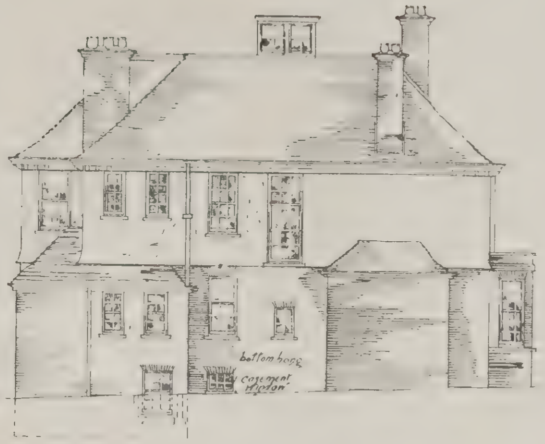
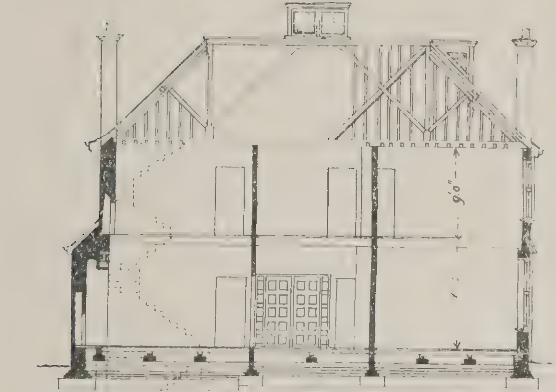


NORTH ELEVATION.



WEST ELEVATION.



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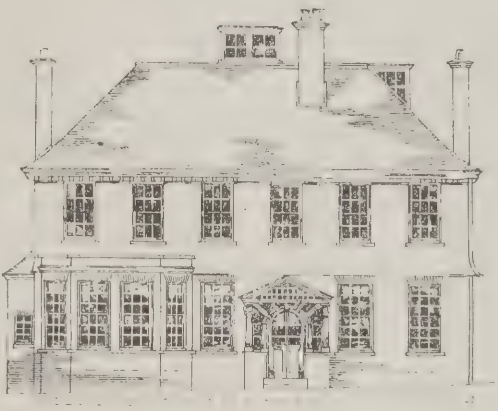
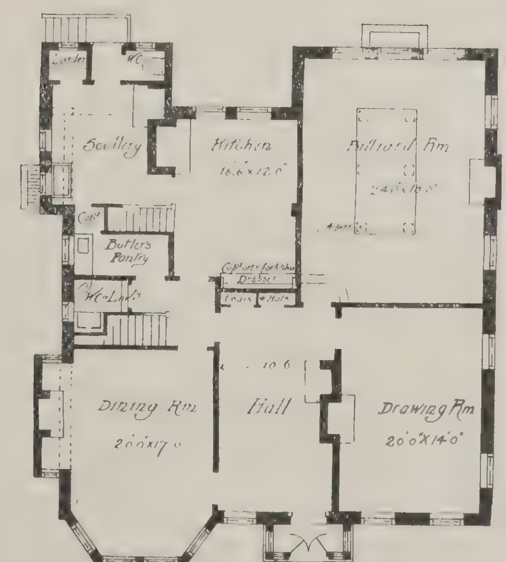
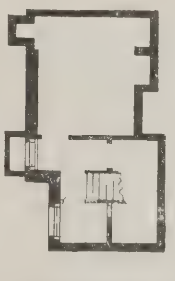


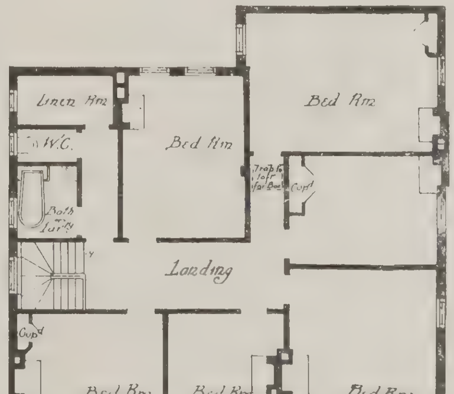
SOUTH ELEVATION.



GROUND-FLOOR PLAN.



BASEMENT PLAN.



FIRST-FLOOR PLAN.

"HARCOURT," CHRISTCHURCH PARK, SUTTON, SURREY. H. D. SEARLES WOOD, F.R.I.B.A., Architect.

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pressed for payment of his account that any complaint was made. Plaintiff received one payment of £100 on account, and that was only after a writ had been issued, and had to be stopped. After that, further pressure was brought to bear upon the defendants for payment of the remainder. For the defence, it was stated that the defendants sub-contracted for the work, the erection of the chapel being in the hands of other builders, Messrs. Thorn. The latter communicated to the defendants that some of the seats were too short and others too long, and, that, in consequence, 185 hours were spent in fitting them properly. They therefore claimed deductions from the defendants, who in turn considered they were entitled to make deductions to the extent of £44 from the plaintiff's bill. After a long hearing the jury gave a verdict for the full amount, and judgment was entered for the plaintiff with costs.

Bricks and Mortar.

APHORISM FOR THE WEEK

It is a horrid thing for a fond architect to find his monuments received in silence.

R. L. STEVENSON.

Our Plates. THE foundation stone of the north-west portion of the west front of the extension of the Edinburgh City Chambers was laid recently. It is several years ago since the plans by Mr. R. Morham, city architect, for the extension of the City Chambers were sanctioned. About £200,000 are to be spent on the extension and improvement of the buildings. The work has gone on in sections. Chief among these was that part on the west side of the Exchange, and extending westwards to Warristoun Close, in which the new burgh court-room, council refreshment-room and museum are situated. The portion now arranged for will be continued along Warristoun Close, and will have a frontage to Cockburn Street and the north. On that side it takes the place of the house known as the City Hotel; but the new building, which has a massive tower-like face, will be carried up to the height of the present City Chambers. Our illustration shows the Cockburn Street frontage. From the pavement at Cockburn Street, with which it will be brought into line, this block will rise to a height of about 120ft. The first and second storeys, which are in one, and the third, fourth and fifth, will be built in deep rusticated courses, each stage being pierced with three windows; on the sixth floor the windows have broken coigned architraves; there is an entresol with lozenge-shaped openings; and the seventh and eighth floors, also in one, are elaborately and decoratively treated with pilasters, those framing the central window also carrying a broken pediment. At the wall-head there is an open balustrade, and the front is finished off by a group of statuary. In the two top floors is placed the new council chamber—a hall 65ft. in length, 36ft. in breadth, with an average height of 25ft.—its area being nearly three times that of the present council chamber, which is altogether too small for the number of members now constituting the council. The new council chamber is the leading feature of the part of the scheme now being built, the estimates for which amount to between £15,000 and £16,000. Lifts will be provided from Cockburn Street to the various stages of this block, both for passengers and stores. The chief contracts have been secured by Messrs. Turner & Sons for the masonwork, and by Mr. Colin M'Andrew for the joinerwork; and it is hoped that the extension may be completed by the end of next year. It is intended that the block will be faced with Prudham stone. The other parts of Mr. Morham's design still to be executed include the extension of the whole of the north face of the present City Chambers to the line of Cockburn Street, and its extension southwards by Allan's Close, but this important contract has not yet been gone into. In the Renaissance style of architecture, it embraces dignified and telling features, including on the top storeys a central section with columns, cornice and pediment, with side towers and domes, the whole crowned with a grand central dome and lantern.—The three cottages at North Cheam for Mr. A. Brock were built with local red bricks and hanging tiles, and Broseley tile roofs, by Messrs. R. Jones & Son, builders, West Street, Sutton, Surrey. "Harcourt," Christchurch Park, Sutton, Surrey, was built for Mr. A. Hobdell, of red bricks for the walls on ground floor, and rough-cast on the first floor. The principle aimed at in the design was to produce a symmetrical elevation with a plan containing two reception-rooms, billiard-room, and large hall available as the third sitting-room. The work was carried out by Messrs. R. Jones & Son, of West Street, Sutton, Surrey. The designs for both the cottages and this house are by Mr. H. D. Searles Wood, F.R.I.B.A., of 157, Wool Exchange, Coleman Street, London, E.C.

Roman Finds at Windermere Waterhead. AT a recent meeting of the Westmorland and Cumberland Archæological Society at Carlisle, a paper on the recent Roman finds at Windermere Waterhead by Mr. H. S. Cowper was laid before the members. The finds were made last year in excavating for the new sewage works on the Borrans road near the Roman camp at Windermere Waterhead. Mr. Cowper pointed out that this camp in former times was probably well protected on all sides by bog or morass, except on the east, where the ground was a little higher and harder; and that there was some evidence that the Rothay ran close to the western rampart, so that the position of the "castrum" was a fairly strong one. The finds were, first, at a place 500ft. from the north-east angle of the camp, from which place for about 230ft. the workmen found pavement, upright posts and transverse beams. Further south, close to the same angle of the camp, more piles were discovered, and a mass of black material, which may have been the site of a smelting furnace, although the evidence of this is insufficient. Few relics were discovered, the most interesting being a well-made Roman bell of bronze, and a leaden sling bullet. Pottery in fragments also occurred in small quantities. Mr. Cowper is of opinion that the most northerly patch of piles and beams are part of a "corduroy" road of beams laid across the marsh. He pointed out that the three roads which are supposed to have approached Ambleside camp may all have joined somewhere about Rothay bridge, in order that one single way might be formed across the moss to the camp. From a strategic point of view such an approach would be a good one, because an enemy marching on the camp over such a road would have to pass under the rocky points immediately north of the camp, on which slingers, archers and catapults could be stationed, and that the road being laid on a bog, the attacking party could not leave it to rush the position. But it must remain for further finds to prove or disprove this suggested line, which with the present meagre evidences can only be tentative.

New Belfast Architectural Society. THE Secretary of the Royal Institute of British Architects have received the following communication from Sir Thomas Drew, F.R.H.A., P.R.I.A.I.: "I am glad to inform you that at length, after many difficulties, a society of respectable architects has been established for the north of Ireland. Heretofore, as you may be aware, the position of the profession of architecture in the important city of Belfast (with a population of 380,000) has been a scandal and discredit to the position of architects in the rest of the kingdom. I cannot say that the perfect chaos of professional practice and usage, and the indecencies of rivalries and competition for fees at any amount, and the low social standard of a large body practising as architects in Belfast, is at at end, or even that for years the status of the architect may be in line with other cities of the kingdom. A good beginning, however, has been made by an association of the better class of architects, and prevailing scandals of architectural practice will be checked by notoriety and publication of them at least. This society will, for the present, be affiliated to and in harmony in its by-laws with our Institute of Architects in Dublin, and will practically, until its mature existence is assured, be under the influence of the Royal Institute of British Architects, through ours over it as an Allied Society. The members of the new society has done me the honour to insist that I shall be first president of it in my native town, with Mr. W. I. Gilliland as a working vice-president and Mr. Fitzsimmons as secretary."

Vandalism in Rome. WHEN a part of the Tiber embankment broke up and fell into the river last November, a commission was appointed to inquire into the circumstances of the catastrophe, and to propose a remedy for the erosion of the embankment foundations by the current. The commission has now reported, and some of its members have had the effrontery to propose that the classical island of San Bartolomeo should be destroyed in order to make greater room for the water. Fortunately, this proposal has no chance of being adopted. Its authors are already being covered by a storm of abuse and ridicule. A similar spirit is, however, being shown with regard to the arrangement of Piazza Venezia so as to give a clear view of the colossal monument to Victor Emmanuel II. which, at a cost of £1,300,000, is being very slowly erected on one of the sides of the Capitol Hill. It was originally intended to erect a monument to Victor Emmanuel near the railway station, and a French artist won the competition for the design. Signor Depretis and his friends, however, listened to the outcry against the idea of a French artist being allowed to construct the monument, and in order to obtain a pretext for annulling the competition, he decided to place the monument on the Capitol Hill, where an Italian artist, Count Sacconi, has slowly been erecting a huge pile at a heavy cost for the last twenty years. Now the monument is well on its way towards completion, and in order to render it visible it has been decided to demolish the wing of the Palazzo Venezia, known as the Palazetto, and thus to mutilate the historic headquarters of the Venetian Republic in Rome. The site of the fine Palazzo Torlonia, which stands opposite to the Palazzo Venezia, and which also obstructs the view of the monument, has been bought up by speculators, who intend to build in place of the Palazzo Torlonia a new hotel by the side of the new thoroughfare which is to be opened. The speculators have so far yielded to public opinion as to put a few more tons of stone, instead of brick, into the facing of their hotel, but they intend to fill the basement with glaring shops where barbers, chemists, greengrocers, or jewellers may find a home. Pressure has been put on Count Guisso, Minister of Public Works, to prohibit this outrage to artistic decency.

Decoration of the Royal Exchange. THE chronological scheme adopted by the Gresham Committee for filling in the panels of the Royal Exchange with works of art is as follows: 1. The Ancient Britons and Phœnicians trading on the coast of Cornwall (given and painted by the late Lord Leighton). 2. Alfred the Great repairing the walls of the City in the ninth century. 3. William the Conqueror granting a charter to the citizens of London (painted by Mr. Seymour Lucas, R.A.). 4. William II. building the Tower of London. 5. Henry II.: Foundation of the Hospital of St. Thomas of Acon. 6. King John sealing Magna Charta (painted by Mr. E. Normand). 7. Scene of a Folkmote in St. Paul's Churchyard. 8. Edward II.: The famous *iter* at the Tower. 9. Edward III.: The entertainment of the Vintners' Company to the five kings. 10. Richard II.: The insurrection of Wat Tyler. 11. Henry IV.: Sir Richard Whittington's charities (painted by Mrs. E. Normand—Henrietta Rae). 12. Henry VI.: The Charter of Philip the Good, Duke of Burgundy, to the Merchant Adventurers, 1446. 13. Henry VI.: Marching of the trained bands to Barnet. 14. Subject not yet settled. 15. The award of Lord Mayor Bittlesdon in the dispute as to the precedence of the Merchant Taylors' and Skinners' Companies (to be painted by Mr. Abbey, R.A.). 16. The Crown offered to Richard III. at Baynard's Castle (painted by Mr. S. Goetze). 17. Foundation of St. Paul's School by Dean Colet, *temp.* Henry VII. 18. Elizabeth: The opening of the Royal Exchange (painted by Mr. E. Crofts, R.A.). 19. Charles I. demanding the five members at Guildhall (painted by Mr. Solomon J. Solomon, A.R.A.). 20. The Fire of London (painted by Mr. Stanhope Forbes, A.R.A.). 21. William III. and Mary: Founding of the Bank of England. 22. William IV: Opening new London Bridge. 23. Queen Victoria opening the third Royal Exchange (painted by Mr. Macbeth, A.R.A.). 24. Modern commerce (being painted by Mr. Brangwyn).

ARTIZANS' DWELLINGS AT BATH.

LAST week the Dowager Lady Tweedmouth opened the first section of the workmen's dwellings erected by the Bath City Council in the Dolemeads. The construction of these houses is only a portion of the improvements recently effected by the Corporation in this flood-visited district of the city. Along the riverside a number of dilapidated old habitations have been demolished, and an embankment built to the Avon, which has been given increased width at this point. Before sanctioning the demolition of these cottages the Local Government Board required that provision should be made to accommodate as many families as were disturbed, and the Council decided to purchase about an acre of garden ground in the Dolemeads, and on this to erect model dwellings. Objection was taken to the houses being placed in a spot which is the first to be inundated when the Avon overflows, but this was overcome by raising the site above the highest recorded flood, that of 1894. In order to do this, the city surveyor (Mr. C. R. Fortune) had tipped on the land about 13,500 loads of material. The expenditure on the work (for which the Whitehall authorities originally granted a loan) was £10,500, of which sum £1,550 was for the purchase of property. But, in addition to that, £3,470 has been expended in acquiring property so as to widen the approaches. All the money has not been laid out, for though a tender of £6,340 has been accepted for building forty houses, only sixteen are completed so far, and these were opened last week. They are on solid concrete foundations, with slate and bitumen damp-courses, and built of best brick. Each house provides on the ground floor a parlour, kitchen and offices, while over are three bedrooms. They are thoroughly well built. They vary slightly in dimensions, and the rents paid will be 5s. and 6s. 6d. weekly, there being a considerable demand for them at these figures. It is hoped that as opportunity occurs other sites in the Dolemeads will be secured and raised. Mr. Toogood is the contractor.

WAKEFIELD CATHEDRAL EXTENSION.

THE memorial stone of the extension of Wakefield Cathedral, which is to be built in memory of the late Bishop Walsham How, was recently laid by the Archbishop of Canterbury. The plans prepared by the late Mr. J. L. Pearson, shortly before his death, and confirmed by his son, Mr. Frank Pearson, provide for the extension of the chancel eastwards, adding to the length of the choir. There is in addition to be a retro-choir, the approach from which, and forming a continuation of it, will provide a chapel, and thus afford accommodation for morning and special services. The chancel aisles are to be extended to the same length as the retro-choir. This extension will take the form of north and south transepts, with eastern aisles. A chapter-house and some vestries are also to be provided underneath. The altar will be removed one bay eastward, and then it will be separated from the chapel by an altar screen. Under an arch on the north side of the sanctuary it is proposed to place a canopied tomb, with a recumbent effigy of the late Bishop How. The position of the bishop's throne and choir stalls will also be altered, and various other internal improvements effected. The whole of the work was originally estimated at £20,700; but, in addition to this being exceeded by £10,000, another £10,000 had to be expended in enlarging the site. Messrs. Armitage & Hodgson, of Leeds, who erected the County Hall at Wakefield, and more recently extended the West Riding Asylum at Wakefield, were fortunate in securing the contract for the Cathedral extension, and they have made fairly satisfactory progress with the masonry work of the new chapter-house and vestries.

The death is announced of Mr. Larner Sugden, F.R.I.B.A., of Leek and Hanley, at the age of fifty. His remains were cremated at the Manchester Crematorium.

Keystones.

The "Architect and Contract Reporter" has been formed into a limited liability company under the title of Gilbert Wood & Co., Ltd., with a share capital of £30,000.

A Monument of Hoche, the famous French general, has been erected on the Quiberon Peninsula. The statue is the work of Dalou, and represents the soldier standing on a rock in an attitude of melancholy looking out to sea.

The New St. John the Baptist's Church, Great Meols, was opened recently. It provides seating for about 250 persons, and the new church has been built so that it may be added to the school accommodation, with a classroom intervening.

An Equestrian Statue of Roland, Charlemagne's famous paladin, has been executed by the sculptor, Pierre Granet; and the inhabitants of Cambo-les-Bains have opened a public subscription for raising the money to purchase it. Cambo-les-Bains lies in the shadow of the great mountains where the paladin met death so heroically.

The New Blue Coat Hospital at Wavertree is to be erected from designs by Messrs. Briggs, Wolstenholme, Hobbs & Arnold Thornely, of 14, Castle Street, Liverpool. Mr. W. D. Caröe was the assessor in the competition, fourteen Liverpool architects being invited to compete, and four being selected for the final competition. The building is estimated to cost £90,000.

A New Workhouse that is not Wanted.—The Greenwich Guardians have decided that it is advisable to sell to some other body their new and, as yet, unoccupied workhouse, which was erected at Grove Park at a cost of about £250,000. It is stated that the present workhouse provides sufficient accommodation to meet all the requirements of the borough. Notice was given of a motion to appoint a deputation to the Local Government Board on the matter.

New Clock and Tower at Foxdale, I.M.—The dwellers in the mining village of Foxdale St. John's, I.M., have the honour of being the possessors of the first public monument erected to the memory of her late Majesty Queen Victoria in the United Kingdom. It consists of a clock tower 40ft. high, built of local stone with corner-pieces of concrete, and at the base has eight supporting buttresses. It has been designed by Mr. John Nicholls, engineer of the mine. The stonework has been done by the masons attached to the works. The clock has been supplied by Messrs. J. B. Joyce & Co., of Whitchurch, Salop.

The Berwickshire County Buildings at Duns are undergoing alterations and additions. The front elevation to Newtown Street is unchanged, and the new rooms and offices have been placed at the back. On the ground floor are offices for the sheriff clerk, a record-room, office for the county sanitary inspector, an additional room for the police, and two more cells. On the second floor the present court-room will become a county-council room, with an office adjoining for the county clerk. A new court room has been provided and furnished with a jury box. There are also rooms for the sheriff, procurator fiscal, law agents, jurors and witnesses, and an office for the county medical officer. The work will cost about £3,000.

West of Scotland Technical College.—At a meeting of the Governors of the Glasgow and West of Scotland Technical College recently, it was intimated that the donations to building fund now amounted to £85,500. The report from the special committee appointed to arrange for the selection of an architect for the new college buildings was considered, together with a detailed report from the board of studies upon the competitive designs for the new buildings, and a report from the measurers upon the areas shown in the various schemes and the probable cost of each. It was thereupon unanimously resolved, in accordance with the strong recommendation contained in the report from the board of studies, to approve the design submitted by Mr. David Barclay and to appoint him architect for the new buildings. Mr. Barclay's plan shows a floor area of about 144,000 sq. ft., and it is estimated that the cost of the building will be about £150,000.

A Stained-Glass Window at Chipping Sodbury parish church has been erected to the memory of the late Rev. J. P. F. Davidson, vicar of the parish for eleven years.

Society of Architects: Visit to Oxford.—The society proposes to hold its summer excursion this year at Oxford on Saturday, July 27th, under the leadership of Mr. N. W. Harrison, of Oxford. Members may introduce a limited number of friends, and ladies are specially invited. Those desirous of taking part in the excursion should send their names at once to the secretary (St. James's Hall, Piccadilly, W.). No excursion will be held unless at least twenty names are received.

Houses of Foreign Styles in Paris.—The scheme for the erection of houses *à l'Italienne* at the Champ de Mars has aroused the ire of Parisian architects and artists, and they have addressed a protest to the Municipal Council. It is urged, first, that the houses to be erected on the famous ground shall be constructed in the French style; secondly, that the trees to be planted shall be of French origin; and, thirdly, that the garden shall be designed not in the English but in the French fashion.

The Foundation of the Hospital of St. Thomas of Acon, which is to form the subject of one of the panels in the ambulatory of the Royal Exchange, was due to a sister of Beckett, who twenty years after his murder built a chapel and hospital of Augustine Friars close to Ironmonger Lane, on the site of the very house wherein he was born. The building derived its name from the fact that Beckett's mother was born at Acre. It was Henry VIII. who permitted the authorities to connect the building with the garden of Grocers' Hall by means of a gallery over Old Jewry.

Carving in Sledmere Church.—There has just been wrought at Sledmere Church, East Yorkshire, the last of a series of very elaborate diapers in stone. Last year saw those at the east end of the aisles completed; now the carvings at the end of the chancel are finished. The diapers at the north side are all square patterns, and embrace renderings of oak leaves and acorns, vine leaves and grapes, lilies, roses, etc., treated in the more or less conventional manner of the period, as well as some leaves which are entirely conventional in their treatment. The whole of the work has been designed and executed by Mr. John Baker, of Kennington, S.E., and he is now engaged upon another church at East Layton, which was built from plans by Mr. Mitchell in 1895.

A New Wesleyan Church at Tanfield, Bedale, was opened on Friday, June 21st, the architects being Messrs. W. J. Morley & Son, of Bradford. The building is of stone, in the Decorated style, with tower and spire. The interior woodwork of pews and open waggon-headed roof is of pitch-pine, and the tracery windows are fitted with tinted leaded lights, a special feature being a figured transept window, which has been made by Mr. W. Lazenby, of Bradford. Accommodation is provided for about 250 persons, and there is a choir vestry, and one for the minister, from which convenient access is gained to the pulpit. A band-room is provided at the rear of the church, and the old chapel adjoining the new premises will be used as a school.

New Masonic Halls at Motherwell are being erected in Hope Street jointly by the two local masonic lodges—namely, Lodge St. John Dalziel, No. 406, and Lodge Livingstone St. Andrews, No. 573. The building, which is estimated to cost £3,500, was designed by Mr. J. L. Cowan, architect, Glasgow, who was awarded the first prize in competition. It consists of three floors. On the top floor there is a lodge-room and smaller hall for friendly societies, &c.; on the second floor a large hall suitable for concerts, socials, &c., with purveyor buffet and kitchen and smoking-room; while on the ground floor is the main entrance hall, reading-room, dwelling-house, &c. The halls will be fitted up with electric light. The contractors for the work are: Mason, Alexander Sym, Motherwell; joiner, Thomas Miller, Motherwell; plasterwork, James Craig, Motherwell; plumber, John Alston, Motherwell; slater, James Thompson, Motherwell; heating apparatus, Mr. Hamilton, Glasgow; the work, Haddow, Forbes & Co., Glasgow.

Competition for the New Board School at Aldershot.—The designs of Mr. C. T. Coggin, A.R.I.B.A., of London, have been selected. The buildings are estimated to cost £12,000.

A New Wesleyan Church at Hindley has been erected at a cost of about £8,000 from designs by Messrs. Waddington & Son, of Manchester. The style is Romanesque, and it is built of dressed Rainforth stone.

Mr. William Scott, Soane Medallist and Travelling Student of the R.I.B.A., who has resided for some years in Italy, has been invested by the King of Italy with the Order of the Crown of Italy, a distinction which is rarely conferred on foreigners.

A New Volunteer Drill-Hall at Horncastle is being erected at the south-east corner of the Wong. The total cost of the new hall will be about £2,500. The building will comprise a hall 98ft. long by 38ft. wide, an orderly-room, armoury, officers'-room, sergeants'-room, men's recreation room, canteen, magazine and band-room. The contractors are Mr. J. S. Heath and Mr. G. Y. Pike, of Horncastle, and the architect is Mr. Butcher, of Spilsby.

Thanet Place, the last of the exclusively residential courts in Fleet Street, is about to fall under the hands of the housebreaker. The ten prim little houses, with the gargoyled doorways and with windows surmounted by delicately carved work, are in excellent preservation ; but the space just in front of the Law Courts is so valuable that three-storey dwellings cannot remain there. The court has only a narrow entrance, no wider than the doorway of a garden. The courtyard, however, is of considerable width. There Dr. Johnson lived, at No. 4.

New Baths at Northam have been erected. There was a difficulty as to tendering for the work, but Mr. Bennett, the borough engineer, undertook the construction. The estimate for the cost of the bath was £915 11s. 2d., but the actual cost was £909 3s. 1d. An ornamental cast-iron clock column over 45ft. high, with a three-dial clock, has also been erected, and, together with the foundations, have increased the total to £1.239 7s. 2d. The total length of the bath is 150ft. by 30ft. wide, with 6ft. 6in. of water at the deepest and 3ft. 3in. at the shallowest end. The bath contains when full, 133,000 gals., and can be emptied in twenty-five minutes, thus ensuring efficient cleansing.

Exeter Guildhall.—A detailed report of the repairs to Exeter Guildhall front last year, for the city records, has been presented by Mr. William Weir, who carried out the work at the instance of the Society for the Protection of Ancient Buildings. It reveals the very dangerous state of portions of the front prior to the restoration, and wonder is expressed that some had not collapsed. Mr. Weir, speaking of the pliant nature of Beer stone (with which the front is faced), says : "It lends itself under such a strain to bend like a piece of wood, as seen in the existing mullions and transoms of windows, some of which are quite bowed, and show no signs of a crack." The total cost of restoring the front was £1.250 16s., which was money well spent. While the front is a mixture of Italian Renaissance and Tudor, dating from 1593, the beautiful hall which it masks is Gothic, and more than a century older. On the site of the present front there formerly stood a chapel.

A New Wesleyan Chapel at Birkenshaw is being erected at Westgate Hill, from designs by Messrs. Walker & Collinson, of Bradford and Morcambe. The new building will be in Decorated Gothic style. There will be a spire 100ft. high. Pitch-faced delph wallstones, relieved by Ashlar, dressings and Guiseley sandstone, is the material to be used, and the roof is to be covered with green Westmorland slates. The congregation will be all on one level, and the building will accommodate 540 persons, but over a central vestibule there will be a small end gallery to seat about 100 scholars. In the nave and transepts the ceiling is to be trefoil in form, the lower part being of plaster filled in between wood ribs, and the upper arch of wood, divided into panels by mouldings and arched roof trusses. The chancel will be set with marble pavings and a pulpit of oak will rest on a stone base. All the woodwork will be of pitch-pine and the windows will have stone tracery heads, filled in with leaded lights. The total cost will amount to £6,500.

A Statue of Sir S. Waterlow has been erected in front of the Westminster City School in Palace Street S.W. It is by Mr. F. M. Taubman.

A New Baptist Chapel has been opened at Southend-on-Sea, in Anerley Road. It will seat 230 persons, and is built of red bricks with stone dressings and tracery windows. The roof is of red tiles. The architect is Mr. J. E. Lose, of Southend, and the builder Mr. S. Moss, of the same place.

Sir Alexander Binnie has resigned his position as engineer to the London County Council. Sir Alexander was appointed to the present post in 1890. From 1862 to 1866 he was engaged on Welsh railways, and from 1868 to 1874 in the Indian Public Works Department. In 1875 he was appointed engineer to the city of Bradford, which post he held up to the time of going to the L.C.C. His best known works are the Nagpore Waterworks, the Blackwall Tunnel, and the Bradford Waterworks.

A Wesleyan Church at Sudbury is being erected to accommodate 400 people, and the estimated cost, including site, is £2,500. Eventually it is projected to add a Church Sunday School, a Church parlour, and vestries, at a further cost of £1,500. The architects are Messrs. Gordon & Gunton, F.R.I.B.A., of London. The new chapel will be situated at the junction of North Street and Melford Road. The style adopted is Gothic of the sixteenth century. The structure will be built with flint walling and Bath-stone dressings. The plan of the building at present contemplated consists of a church with nave, transepts, chancel, organ chamber and minister's vestry. There are four entrances and exits, two of them, in the main street, being provided with porches. The builder is Mr. H. Feast, of Haddenham, Cambs.

The Horniman Museum, Library, and Gardens, situated at Forest Hill, S.E., and presented by Mr. F. J. Horniman, M.P., to the London County Council for the use and enjoyment of the people, was opened last Saturday. It is now ten years since Mr. Horniman afforded to the public the opportunity of inspecting the curiosities he has collected in the course of his travels, and they had attracted a large number of visitors. He has now provided a large and well-arranged museum, on which he has spent £40,000, for the accommodation of his collection, together with a library. In presenting this museum to the London County Council he has included in the gift his former residence, Surrey Mount, with grounds, and also six residences, with five and a half acres of ground, standing between the museum and Lordship Lane Station, and producing an income of about £600 a year. The museum itself is 280ft. long by 61ft. wide, with a superficial area of 16,500ft. The contents are of great variety and value.

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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
July 5	Whitenose, Dorset—Coastguard Buildings	Admiralty	Director of Works Department, 21 Northumberland Avenue, W.C.
,, 5	Huntingdon—Alterations	Guardians	E. Borissow, 151 High Street, Huntingdon.
,, 5	Upton Park, Essex—Alterations, &c. to Schools	St. George's-in-the-East Guardians	G. A. Wilson, Hopetown House, Lloyd's Avenue, E.C.
,, 6	Bedford—Shelter	Burial Board	H. Young, Architect, Midland Road, Bedford.
,, 6	Biggleswade—Showrooms	Maythorn & Son	Mr. Twelvetrees, Architect, Sandy.
,, 6	Greenold, near Ulverston—Rebuilding	Lancashire County Council	W. H. Schofield, County Offices, Preston.
,, 6	Skircoat, near Halifax—Villa	——	R. Horsfall, Son, 22 Commercial Street, Halifax.
,, 6	Queensbury—Three Houses	——	J. Drake & Son, Architects, Queensbury.
,, 6	Rawdon, near Leeds—Farm Buildings	——	B. Hopkinson & Co., Architects, Craven Bank Chambers, Keighley.
,, 8	Birmingham—Approaches	Public Works Committee	J. Price, City Engineer, Council House, Birmingham.
,, 8	Blaina—Renovating	——	I. Aled Jones, School Board Offices, Blaina, Mon.
,, 8	Bristol—Church	——	H. C. M. Hurst, 30 Broad Street, Bristol.
,, 8	Clitheroe, Lancs—Arching	Rural District Council	The Clerk, 21 Church Street, Clitheroe.
,, 8	Hexthorpe, near Doncaster—Cottages	Workman's Club	Secretary, 2 Langer Street, Hexthorpe.
,, 8	Pontlottyn, Wales—Villa	I. Price	I. Price, Grocer, Pontlottyn.
,, 8	Pontlottyn, Wales—Sixty Houses	Workman's Building Club	D. W. Jones, Board Schools, Pontlottyn.
,, 8	Pontlottyn, Wales—Altering	William Powell	William Powell, 25 Merchant Street, Pontlottyn.
,, 8	Rawdon, near Leeds—Alterations	——	Barber Hopkinson & Co., Craven Bank Chambers, Keighley.
,, 8	Skerton, Lancaster—Shops	Lancaster and Skerton Co-operative Soc.	Austin Paley, Castle Hill, Lancaster.
,, 8	Sunderland—Church	——	W. & T. R. Millburn, 20 Fawset Street, Sunderland.
,, 8	Trelewis, Wales—Houses	Cape Lewis	T. Roderick, Architect, Aberdare, also at Merthyr.
,, 8	Vochriw, Wales—Houses	Building Club	L. P. Davies, Vochriw.
,, 8	Waunllwyd, near Ebba Vale, Mon.—School	School Board	R. L. Roberts, Victoria Chambers, Abercarn.
,, 8	Leeds—Police Station	Watch Committee	Bedford & Kitson, Greek Street Chambers, Leeds.
,, 8	Llanberis, N. Wales—Church House	——	The Rector, St. Padarn's Church, Llanberis.
,, 8	Abergavenny—Stone-arched Bridge, &c.	Rural District Council	J. Gill, 4 Brecon Road, Abergavenny.
,, 8	Bridgwater—Alterations, &c. to School	Governors	Samson & Cottam, Architects, Bridgwater.
,, 9	Clydach, Wales—Church	Rev. D. Williams	E. M. B. Vaughan, Architect, Cardiff.
,, 9	Cork—Alterations, &c., to Schools	Dist. Lunatic Asylum Com. of Management	H. A. Cutler, City Engineer, Municipal Building, Cork.
,, 9	Distington, Cumberland—House	——	Mr. Jefferson, Brough, Black Lion, Distington.
,, 9	London, N.E.—Alterations	Bethnal Green Board of Guardians	Holman & Goodrham, 6 King's Bench Walk, Temple, E.C.
,, 9	Rochdale—Library Extension, &c.	Library Committee of the Corporation	J. Horsfall, Architect, Todmorden.
,, 9	West Ham—Fire Brigade Station, &c.	Town Council	Borough Engineer's Office, Town Hall, West Ham.
,, 10	London, S.W.—Additions to Med. Officer's House, &c.	Wandsworth and Clapham Union Gdns.	C. A. Sharp, 11 Old Queen Street, Queen Anne's Gate, S.W.
,, 10	King's Lynn—Repairing, &c.	Corporation	H. J. Weaver, Borough Engineer, Town Hall, King's Lynn.
,, 10	Gt. Hale—Wesleyan Chapel	——	J. Clare, Sleaford.
,, 10	Wortley—Board Room, &c.	Board of Guardians	G. A. Wilde, Bank Street, Sheffield.
,, 10	London, W.C.—Pulling Down Workhouse	Holborn Union Guardians	Smith & Coggin, 14 York Buildings, Adelphi, W.C.
,, 11	Clevedon, Somerset—Laundry Buildings	Laundry Co., Ltd.	Company's Registered Offices, 19 Alexander Road, Clevedon.
,, 12	Pennan, Aberdeenshire—Coastguard Buildings	——	Director of Works Department, Pennan.
,, 13	Little Bolas—Abutment and Wing Walls	——	A. T. Davis, Shirehall, Shrewsbury.
,, 13	Hellesden, nr. Norwich—Additions to City Asylums	Norwich Corporation	A. E. Collins, City Engineer, Guildhall, Norwich.
,, 15	Leeds—Underground Conveniences	Market Committee	City Engineer's Office, Municipal Buildings, Leeds.
,, 15	Leeds—New Premises	West Riding Union Banking Co., Ltd.	Oliver & Dodgshun, Architects, Park Square, Leeds.
,, 16	London, E.—Two blocks of Workmen's Dwellings	London County Council	Architect's Department, Housing of the Working Classes Branch, 18 Pall Mall East, S.W.
,, 16	Kingston-on-Thames—Addition to Nurses' Home	Union Guardians	W. H. Hope, Architect, Hampton Wick.
,, 16	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
,, 17	Leeds—Hospital Extension	Sanitary Committee	E. T. Hall, 54 Bedford Square, W.C.
,, 18	Wimbledon—Conveniences	Urban District Council	Council Offices, The Broadway, Wimbledon.
,, 18	Swindon—Pupil Teachers' Centre and School	School Board	W. Seaton, Clerk, Town Hall, Swindon.
,, 21	Kenchester, Hereford—Widening Culvert	Rural District Council	T. Llanwarne, 6 St. John Street, Hereford.
,, 22	Caterham, Surrey—Additions to Laundry, &c.	Metropolitan Asylums Board	T. D. Mann, Board's Offices, Embankment, E.C.
,, 29	Glasgow—Substruction of Central Station Extension	Caledonian Railway Company	Engineer, Buchanan Street Station, Glasgow.
	ENGINEERING:		
July 6	Lindfield—Bridge	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
,, 6	Chepstow—Repairing Bridge, &c.	Rural District Council	J. W. Stanton, Clerk to Highways Committee, Welsh St., Chepstow.
,, 6	Cockermouth—Heating Apparatus	——	J. Huddart, Crown Street, Cockermouth.
,, 6	Freshfield, Sussex—Bridge	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
,, 6	Dudley—Plant	Electric Light and Tramways Committee	R. P. Wilson, 66 Victoria Street, Westminster, S.W.
,, 6	Madron, Cornwall—Waterworks	Urban District Council	F. Latham, Engineer, Penzance.
,, 8	Chester—Sewage Works	Corporation	City Engineer, Town Hall, Chester.
,, 8	Hanwell—Repairing Fire Engine, &c.	Urban District Council	W. S. Barnes, Surveyor, Council Offices, Hanwell, W.
,, 8	Douglas, Lanarkshire—Railway	Caledonian Railway Company	Company's Engineer, Buchanan Street Station, Glasgow.
,, 8	Edinburgh—Railway Tank Waggons	Gas Commissioners	W. R. Herring, Manager, New Street Works, Edinburgh.
,, 8	Atherstone—Waterworks	Rural District Council	W. R. H. Chipperfield, Engineer to the Council, Atherstone.
,, 8	Ayr—Drainage Scheme	Corporation	Mr. Eaglesham, Engineer, Ayr.
,, 8	Beith—Tanks, &c.	Drainage Committee	Warren & Stuart, 94 Hope Street, Glasgow.
,, 9	Barnard Castle—Bacteria Tanks and Filters	Rural District Council	J. E. Parker, Engineer, Post Office Chambers, Newcastle-on Tyne.
,, 9	Strabane, Ireland—Well Works	Rural District Council	J. E. Sharkie, Clerk, District Council Offices, Strabane.
,, 9	Barnes—Refuse Destructor	Urban District Council	G. B. Tomes, Engineer, Council Offices, High St., Mortlake, S.W.
,, 10	Littlehampton—Waterworks	——	H. Howard, Engineer, Town Offices, Littlehampton.
,, 10	London, E.C.—Deck Bridges, Workshop Machines	East Indian Railway Company	C. W. Young, Secretary, Nicholas Lane, E.C.
,, 10	Navan, Ireland—Water Supply, &c.	Workhouse Guardians	O. Lacy, Clerk, Workhouse, Navan.
,, 10	Williamthorpe, Derbyshire—Shaftworks at Colliery	——	F. Chambers, Hardwick Collieries, Heath, near Chesterfield.
,, 12	Chesterfield—Waterworks	Rural District Council	J. Frith, Engineer to Council, Baslow, via Chesterfield.
,, 12	Mansfield—Electrical Plant	Corporation	R. Hammond, 64 Victoria Street, S.W.
,, 13	Chorley, Lancs—Pumping Station	Rural District Council	A. Jolly, 9 High Street, Chorley.
,, 13	Fisherton Anger & Bremerton, Salisbury—Sinking Well	Waterworks Company	S. B. Smith, Solicitor, Crown Chambers, Salisbury.
,, 15	London, E.C.—Ten Locomotives	Bengal-Nagpur Railway Co., Ltd.	Sir J. Wolfe Barry, 21 Delahay Street, Westminster.
,, 16	Birkenhead—Electric Tramcar Bodies, &c.	Corporation	A. R. Fearnley, Manager, Sessions House, Brandon St., Birkenhead.

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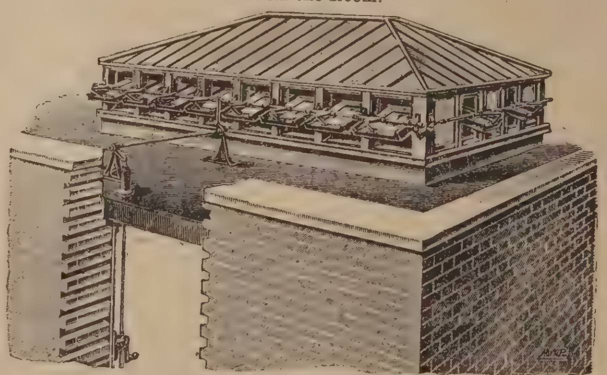

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		SANITARY:		
July	5	Tadcaster—Sewerage Works	Rural District Council	W. Spinks, 20 Park Row, Leeds.
"	5	Brighton—Drain Pipes	Corporation	F. J. C. May, Surveyor, Town Hall, Brighton.
"	6	Elgin—Sewers, &c.	Town Council	Burgh Surveyor, Elgin.
"	6	Moffat, Scotland—Sewerage Works	Town Council	Niven & Haddin, 131 West Regent Street, Glasgow.
"	9	Erith, Kent—Sewers, &c.	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
"	10	Bulford and Tedworth House—Scavenging, &c.	War Office	Acting A. A. General (B.), Tedworth House.
"	11	Ware, Herts—Sewer, &c.	Urban District Council	J. E. Smales, Surveyor, New Road, Ware.
"	13	Wheatley, Oxon—Sewers, &c.	Urban District Council	G. Whinship, 21 St. Michael's Street, Oxford.
"	15	London, W.—Barging Refuse, &c.	Kensington Borough Council	W. Weaver, Borough Engineer, Town Hall, Kensington.
"	15	Northwich—Sewering	Urban District Council	H. Bancroft & Son, 8 Mosley Street, Manchester.
"	15	London, N.—Stoneware Pipe Sewer	Urban District Council	E. J. Lovegrove, 99 Southwood Lane, Highgate, N.
"	16	Godstone—Sewerage Works	Rural District Council	T. O. Barralet, Surveyor, Town Council, New Oxted.
"	16	Heywood, Lancs—Lime, &c.	Gas Committee	W. Whatmough, Gas Manager, Municipal Buildings, Heywood.
"	24	Lyme Regis, Dorset—Sewers	Town Council	M. C. Preston, Town Clerk, Lyme Regis.
		TIMBER:		
July	10	Bulford and Tedworth House—Kindling Wood	War Office	Acting A. A. General (B.), Tedworth House.

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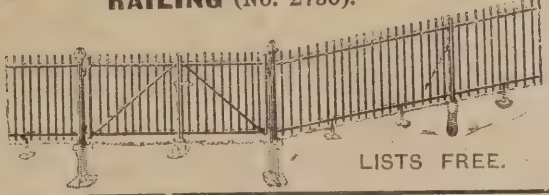

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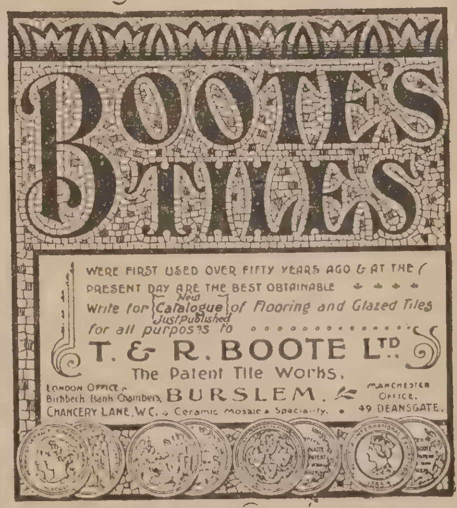

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COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	IRON AND STEEL:		
July 5	London, E.C.—Steel Rails	Great Eastern Railway Company	W. H. Peppercorne, Secretary, Liverpool Street Terminus, E.C.
" 8	Manchester—Cast-Iron Bases, &c.	Tramways Committee	J. M. McElroy, 55 Piccadilly, Manchester.
" 8	Perth—C.I. Pipes, &c.	County Council	Thomson & Wright, 22 Rutland Square, Edinburgh.
" 9	London, E.C.—Railway Stores	Bombay, Baroda & Central India Railway Company.	T. W. Wood, Secretary, Gloucester House, Bishopsgate Street Without, E.C.
" 31	Sydney, N.S.W.—Rails	——	Agent-General for N.S.W., 9 Victoria Street, Westminster, S.W.
	PAINTING AND PLUMBING:		
July 6	Cockermouth—Painting, Varnishing, &c.	Congregational Church Managers	J. Huddart, Crown Street, Cockermouth.
" 6	Southowram, Halifax—Cleaning, Painting, &c., Schools	School Board	J. T. Morton, Solicitor, Argyle Street, Halifax.
" 9	Bradford—Painting, Colouring, &c., Schools	School Board	T. Garbutt, Clerk, School Board Office, Manor Road, Bradford.
" 9	Rawmarsh—Painting, &c., Schools	School Board	E. Corbridge, 22 Dale Road, Rawmarsh.
" 10	Falmouth—Painting Workhouse	Guardians	G. G. Powell, Builder, Penryn.
" 11	London, E.C.—Decorative Repairs to Infirmary	Southwark Union Guardians	G. D. Stevenson, 13 & 14 King Street, E.C.
" 16	Ipswich—Painting and Decorating Works, &c.	School Board	J. H. Hume, Clerk, Tower House, Tower Street, Ipswich.
Aug. 5	Cleckheaton—Interior Renovation of Church	——	Wesleyan Church, Whitcliffe Road, Cleckheaton.
	ROADS AND CARTAGE:		
July 5	Wanstead, Essex—Granite	Urban District Council	W. Blewitt, Clerk, Council Offices, Wanstead, N.E.
" 6	Levenshulme, Lancs—Works	Urban District Council	J. Jepson, Guardian Chambers, Tiviot Dale, Stockport.
" 6	Preston, Lancs—Pavements	County Council	W. H. Schofield, County Surveyor, County Offices, Preston.
" 6	Preston, Lancs—Materials	County Council	W. H. Schofield, County Surveyor, County Offices, Preston.
" 6	Spilsby—Footpath, &c.	Rural District Council	T. A. Busbridge, District Surveyor, Spilsby.
" 8	Leamington—Road Stone	Corporation	Borough Engineer, Town Hall, Leamington.
" 9	West Ham—Making-up Streets	Borough Council	J. G. Morley, Borough Engineer, Town Hall, West Ham, E.
" 9	Rawmarsh—Asphalting	School Board	J. Platts, Architect, High Street, Rotherham.
" 13	Braintree, Essex—Granite	Urban District Council	H. H. Nankwell, Surveyor, Vestry Hall, Braintree.
" 13	London, E.—Road Works, &c.	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 14	Garston, Lancs—Road Works	Urban District Council	F. W. Bowden, Surveyor, Public Offices, Grassendale.
" 15	Bedford—Granite	Corporation	T. S. Porter, Town Clerk, Bedford.
" 16	Epping, Essex—Making-up	Urban District Council	G. J. Creed, Clerk, Epping.
" 17	Winsford—Stone	Urban District Council	H. Hulse, Surveyor, Winsford.
" 22	Dover—Street Improvements	Town Council	H. E. Stilgoe, Borough Engineer, Town Hall, Dover.
" 28	Lochgelly, Scotland—Granolithic Paving	Town Council	W. Birrell, 200 High Street, Kirkcaldy.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
July 31	Manchester—Fire Station and Police Station	£300, £200 and £100	W. H. Talbot, Town Hall, Manchester.
Aug. 1	Egremont, Cumbrld.—Alteration of Property in Main St.	——	J. Lowery, 59 Main Street, Egremont.
Oct. 1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
No date	Dudley—Twenty Workmen's Dwellings	——	J. Gammage, Borough Surveyor, Town Hall, Dudley.

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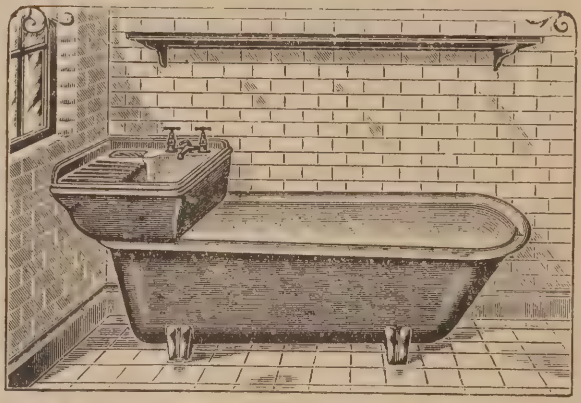

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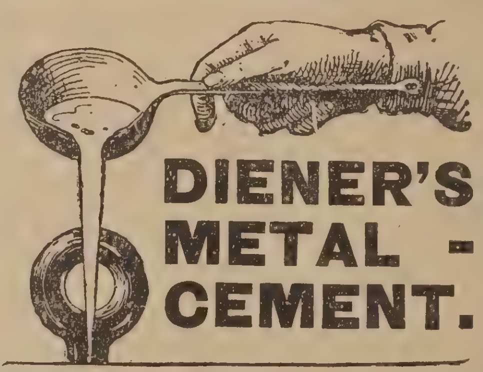

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Particulars, plan, and conditions of sale of Messrs. G. F. Hudson, Matthews, and Co., Solicitors, 32, Queen Victoria Street, E.C.; at the Mart, E.C; and, with orders to view, at the Auctioneer's Offices, as above.

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MR. J. BURMAN ROSEVEAR is instructed to offer for SALE by AUCTION, at the Mart, Tokenhouse Yard, Lothbury, E.C., on TUESDAY, July 2, 1901, at 2 o'clock precisely, all that valuable and unique parcel of FREEHOLD BUILDING LAND situate in Harwood Road, Walham Green having a frontage to Harwood and More Park Roads of about 335 ft. by a depth in the centre of about 78 ft., and containing about 22,225 superficial feet. There being no restrictions on the land, the present forms an excellent opportunity of acquiring this valuable site for the erection of superior shops, with residential flats above. Three-fourths of the purchase-money may remain on mortgage at 4 per cent. Plans, particulars, and conditions of sale may be obtained of R. L. Butler, Esq., Solicitor, 70, Mark Lane, E.C.; of Mr. H. Eynon on the Estate; at the Mart; and of the Auctioneer, Pomona Auction and Estate Offices, 109, New King's Road, Fulham, S.W.

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R.I.B.A., Society of Architects, Surveyors' Institute (Building Section), and Civil Service Technical Examinations. Preparation by correspondence or in residence.—MIDDLETON & CARDEN, 19, Craven Street, Strand, W.C.

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CLERK OF WORKS wanted for CASTLE HOWARD ESTATE. Total abstainer. Salary £140 and House. Apply LADY CARLISLE, Estate Office, Castle Howard, York.

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ARCHITECT AND SURVEYOR'S JUNIOR ASSISTANT, completed 4 years' articles. Neat draughtsman, colourist, and tracer. Good knowledge of surveying and quantities. Good references. Specimens.—J. H. C., 15, Victoria Square, Worksop.

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QUANTITY SURVEYORS and ARCHITECTS.—ASSISTANCE RENDERED in Taking-off, &c., by the hour or on commission.—References given.—H. R. A., 22, Ellison Road, Streatham Common.

TO BUILDERS. — HOT - WATER, GAS, STEAM-FITTING WANTED. Day or piece-work. Long and varied experience.—JAMES, 40, Richmond Terrace, Clapham Road, S.W.

GENERAL FOREMAN seeks RE-ENGAGEMENT. Aged 35. Town or country; country preferred. Just completing country job. Careful with extras and omissions.—D. Read, Foreman of Works, Holmbury St. Mary, Dorking, Surrey.

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GENERAL FOREMAN wants ENGAGEMENT. Thoroughly practical in all Branches; first-class testimonials and reference to present employer.—Address F., "Fretherne," High Beech Road, Loughton.

GENERAL FOREMAN or CLERK of WORKS (Disengaged) seeks re-engagement; good experience on first-class work; bricklayer; age 35; life abstainer; good references and testimonials.—T. B., 10, Florence Road, Kingston-on-Thames.

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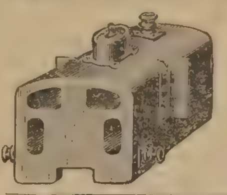

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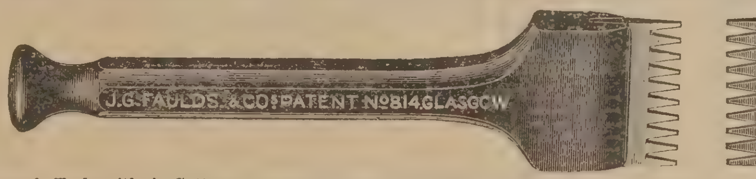
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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

CHIPPENHAM.—For carrying out the septic tank system, for the Rural District Council:—

J. Smith	£2,400		
J. Rudman	2,327		

COVENTRY.—For the work to be done and materials required (except stoneware pipes) in the construction of about 11 miles of 21-in., 18-in., 15-in., 12-in., and 9-in. stoneware pipe sewers and surface-water sewers, with all necessary manholes, chambers, flushing, and ventilating appliances, drain connections, and all other works connected therewith, comprised in the sewerage of the portion of Foleshill within the city, for the Corporation of Coventry. Mr. J. E. Swindlehurst, M.I.C.E., city engineer and surveyor:—

McCarthy & Co., Coventry	£22,728	0	0
Burgoyne & Sons, Ipswich	21,602	8	7
Johnson & Langley, Leicester	19,924	0	0
H. Weldon, Birmingham	18,792	10	6
G. Bell,* Tottenham	17,975	8	4

*Accepted.

DENBIGH.—For the erection of new school buildings in the town of Denbigh. Mr. James Hughes, architect, Denbigh:—

Brickwork.

W. Williams, St. Asaph	£3,600	0	0
Jones & Prichard, Tanrallt, Abergele	3,278	10	11
T. Jones, Prestatyn, near Rhyl	3,198	0	0
Davies Bros., Hill Street, Wrexham	3,133	18	4
P. Edwards, Hodleston, Chester	2,995	0	0
G. H. Marshall, West Smethwick, Birmingham	2,652	0	0
J. S. Roberts, Plough Inn, Denbigh	2,779	11	0

Stonework.

Jones & Prichard	£4,276	11	11
T. Jones	3,878	0	0
W. Williams	3,700	0	0
P. Edwards	3,584	0	0
G. H. Marshall	3,052	0	0
J. S. Roberts*	3,016	11	0

* Accepted.

DENTON (LANCS.).—For rebuilding the "Gardner's Arms," Denton, for Messrs. Bell & Co., Ltd., brewers, Stockport. Mr. John Hindmarch, surveyor:—

P. Barber	£1,850		
Stopford Bros.	1,815		
A. Haughton & Sons, Hyde	1,812		
J. Clayton	1,810		
J. Clayton & Sons	1,742		
J. Broadhurst,* Stockport	1,644		
H. Fielding, Droylsden, Manchester	1,640		
M. Lane, Stockport	1,625		

* Accepted

[Rest of Denton.]

DRIFFIELD.—For the erection of new houses and shops. Mr. Joseph Shepherdson, architect, Driffield and Bridlington:—

Brick, Stone, and Slating and Plastering.

Moses Gage,* Driffield	£897	10	0

Carpenter and Joiner.

W. R. Bishop,* Driffield	607	4	10

* Accepted.

DRIFFIELD.—For the erection of new stabling for Mr. J. Reed. Mr. Joseph Shepherdson, architect, Driffield and Bridlington:—

Thos. Rudd, Driffield	£254	15	
C. W. Dry, Driffield	247	17	
A. Leason, Driffield	235	0	
A. H. Berry,* Nafferton	213	0	

* Accepted.

DUNDEE.—For the construction of new tramways, and for the reconstruction of existing tramways (about three-quarter mile double line); also for the construction of granite cart track, and for paving portions of streets with granite setts (about 19,000 superficial yards in all) for the Town Council. Mr. William Mackison, C.E., engineer:—

G. Mackay & Son, Broughty Ferry	£19,141	10	8
D. & J. Stratton, Edinburgh	17,917	16	8
North British Granite and Whinstone Quarries Company, Ltd., Glasgow	17,907	4	6
D. Murray, Glasgow	17,179	18	2
W. Wilson, Glasgow	15,963	9	2
R. C. Brebner & Co., Edinburgh	15,731	3	10
Young & Co., Glasgow	15,015	3	10
R. Sheach, jun., Dundee	14,987	7	2
J. B. Hay, Dundee	14,702	19	5
T. S. Dick, Broughty Ferry	14,591	5	11
P. Tawse, Aberdeen	13,767	9	6
J. Leith, jun., Aberdeen	13,753	2	10
J. McAdam & Sons,* 47-49 Charlotte Street, Aberdeen	13,687	9	6

* Accepted.

ERITH (KENT).—For private street works in Sheridan Road, Edwards Road, Coleman Road, Ripley Road, Paroma Road, Kentish Road, and Orchard Road, Belvedere, for the Erith Urban District Council. Mr. A. H. Jennings, surveyor:—

Sheridan Road, Edwards Road, Coleman Road, Ripley Road, and Paroma Road, Belvedere.

Wilson, Border & Co., 1 Derby Gardens, Ilford	£5,191	13	3
O. R. Anstead, 96 Wakefield Street, East Ham	4,161	9	11
G. Wilson, Westbury Road, Walthamstow, E.	4,093	0	0
Free & Sons, Maidenhead	4,089	5	3
Woodham & Sons, Langley Road, Catford, S.E.	3,997	6	4
D. T. Jackson, 104 Ripple Road, Barking	3,791	13	0
Laurence & Thacker, 41 Lavender Gardens, Clapham Common	3,658	10	1
R. Ballard, Ltd., Child's Hill, N.W.	3,540	0	0
W. H. Wheeler,* 235 Blackfriars Road, S.E.	3,488	10	2

[Surveyor's estimate, £3,661 13s. 11d.]

Kentish and Orchard Roads, Belvedere.

Wilson, Border & Co.	£2,187	2	3
G. Wilson	1,791	0	0
Free & Sons	1,753	7	2
O. R. Anstead	1,699	14	4
A. C. Soan, 2 Cunliffe Street, Streatham	1,691	11	5
Woodham & Sons	1,671	11	0
D. T. Jackson	1,615	12	0
Laurence & Thacker	1,561	17	2
W. H. Wheeler	1,452	1	6
R. Ballard*	1,449	0	0

[Surveyor's estimate, £1,497 16s. 11d.]

* Provisionally accepted.

FRAMLINGHAM (SUFFOLK).—For the erection of the Mills's Grammar School for Girls at Framlingham. Messrs. Brown & Burgess, architects, Princess Street Chambers, Ipswich:—

F. C. Thurman, Walton, Ipswich	£1,575		
G. Barrell, Woodbridge	1,430		
F. Bennett, Ipswich	1,365		
G. Grimwood & Son, Ipswich*	1,343		

* Accepted subject to approval of Charity Commissioners.

HAMMERSMITH.—For the erection and construction of pump house and well at the Council's wharf, Chancellor's Road; condenser chamber at the electric lighting station; for the laying of 1,750 lineal feet or thereabouts of egg-shaped sewer (4 feet 6 inches by 3 feet), with penstock chamber and manholes: and for the laying of 1,680 lineal feet or thereabouts of 24-inch cast-iron pipes (all within the borough), for the Hammersmith Borough Council. Mr. H. Mair, M.I.C.E., borough surveyor:—

J. H. Neave, Fulham	£9,445		
Bentham & Co., Streatham Hill	7,716		
C. Ford, Willesden	6,274		
J. Mears, Fulham	6,094		
B. Nowell & Co., Kensington	5,961		
S. Saunders, Kensington	5,891		
Wimpey & Co.,* Hammersmith	5,823		

* Accepted.

HENFIELD (WEST SUSSEX).—For the erection of a police station at Henfield, for the West Sussex County Council. Mr. W. B. Purser, A.M.I.C.E., county surveyor, 4 Worthing Road, Horsham:—

J. J. Pickard, Turner's Hill	£1,491	16	7
H. Murrell, Horsham	1,257	3	1
W. Wallis, Littlehampton	1,210	15	3
Hull & Redford, Horsham	1,184	13	2
W. Brown & Sons, Brighton	1,179	0	0
Rowland Bros., Horsham	1,150	0	0
G. Roberts, Henfield	1,130	0	0
R. Cook & Sons, Crawley	1,066	0	0
Lindfield & Son,* Horsham	1,025	0	0

[County surveyor's estimate, £1,055.]

* Accepted.

LANGTOFT.—For alterations to schools. Mr. Joseph Shepherdson, architect, Driffield and Bridlington:—

W. Barnes, Bridlington	£316	0	
Barr & Booth, Bridlington	301	0	
W. Sutton, Nafferton	277	10	
John Sawden,* Bridlington	260	0	

* Accepted.

LINCOLN.—For additions and alterations to "Spread Eagle" Hotel, Lincoln, for the Market Rasen Brewery Company. Mr. J. H. Cooper, architect, Lincoln:—

Co-operative Society	£2,950	0	0
Halker Bros.	2,756	15	0
S. & R. Horton	2,729	0	0
W. & M. Halker	2,679	6	6
F. Pattinson, Ruskington, Lincs.	2,562	12	10
W. G. Brown,* Leicester	2,435	0	0

[Rest of Lincoln.]

* Accepted.

LONDON, S.W.—For extension of board room, erection of new committee room, and sundry other matters at the Union Offices, St. John's Hill, S.W., for the Guardians of Wandsworth and Clapham Union. Messrs. Lansdell & Harrison, architects, 38 Bow Lane, Cheapside, E.C. Quantities by Mr. B. W. Swinstead, 22 Wellington Street, Strand, W.C.:—

Martin, Wells & Co., Vauxhall	£3,070		
Foster Bros., Norwood Junction	2,858		
H. L. Holloway, Deptford	2,780		
Lole & Lightfoot, Chelsea	2,700		
W. J. Renshaw, Putney	2,598		
Spiers & Son, St. John's Wood	2,439		
R. A. Jewell, Wandsworth	2,428		
W. Wallis, Balham	2,403		
Smith & Co., Croydon	2,398		
J. Christie, Uxbridge Road	2,386		
W. Keys, Tooting	2,350		
S. Dockerill, Brompton	2,286		
Wilson Bros. & Lamplough,* Kensal Rise	2,241		

* Accepted.

PURLEY (SURREY).—For the erection of new carpenters' shop and bath accommodation; sanitary and heating apparatus, decorative repairs, and other works at Readham Orphanage, Purley, Surrey, for the Board of Managers. Mr. Alfred Roberts, architect, 18 Nelson Street, Greenwich, S.E.:—

F. & H. F. Higgs	£2,761	0	
E. J. Saunders	2,742	0	
Bulled & Co.	2,674	0	
W. Mills,* Westcombe Park, S.E.	2,452	10	

* Accepted.

SHEFFIELD.—For the erection of three houses and stabling, Grimesthorpe Road. Mr. F. Arnett, architect, 178 Ellesmere Road, Sheffield:—

C. Portass, Cavendish Road, Sheffield	£1,658	8	9
G. Malpass, 121 Smilter Lane, Crabtree	1,586	0	0
M. Grantham, Bernard Road, Sheffield	1,550	0	0
J. Lowe, 47 Brinsworth Street, Attercliffe	1,400	0	0
D. Smith, 131, Howard Road, Walkley	1,281	0	0

Note.—Postponed on account of excessive cost.

WOKING.—For the erection of cottages and stabling, Church Street, Woking, Surrey, for Mr. R. Wasley. Mr. William G. Jones, M.S.A., architect, 3 Broadway, Woking:—

J. Whitburn	£3,858	0	
H. Ingram & Son	3,773	0	
J Harris & Son	3,700	0	
Martin, Wells & Co., Aldershot	3,496	0	
A. A. Gale	3,018	14	
F. Aylott	2,940	0	
Drowley & Co.	2,874	0	
G. Allard	2,676	0	
W. W. Gale	2,644		
F. J. Kemp*	2,607	0	

* Accepted.

[Rest of Woking.]

CURRENT PRICES.

		£	s.	d.	£	s.	d.
FORAGE.							
Beans	per qr.	1	9	0		—	
Clover, best	per load	4	5	0	5	2	6
Hay, best	do.	4	7	0	4	17	6
Sainfoin mixture	do.	3	15	0	4	12	6
Straw	do.	1	8	0	1	16	0
OILS AND PAINTS.							
Castor Oil, French	per cwt.	1	8	0	1	8	7
Colza Oil, English	do.	1	7	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	4	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels	do.	1	12	3		—	
Petroleum, American	per gal.	0	0	5¾	0	0	5⅞
Do. Russian	do.	0	0	4⅞	0	0	5
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	3	0	0		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	5	0	1	6	0
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	1	7	1½	1	7	3
METALS.							
Copper, sheet, strong	per ton	85	0	0		—	
Iron, Staffs., bar	do.	6	10	0	8	10	0
Do. Galvanised Corrugated sheet	do.	11	10	0		—	
Lead, pig, Spanish	per ton	12	8	9	12	17	6
Do. do. English common brands	do.	12	17	6		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	0	0
Do. floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	do.	6	0	0	6	5	0
Do. Mild Bars	do.	7	0	0	7	10	0
Tin, Foreign	do.	129	5	0	129	15	0
Tin, English ingots	do.	130	10	0	131	0	0
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	16	15	0	17	5	0

New Companies.

Judge Springlass Self-Closing Tap and Valve Company, Ltd.

Registered June 15th to acquire from G. C. Ward, jun., of Newcastle-on-Tyne, certain inventions as to taps and valves; and to carry on the business of manufacturers of and dealers in taps and valves and the component parts thereof. Capital £3,000 in £1 shares. The first directors are G. C. Ward, jun., and J. Judge (managing directors). Registered office: 2, St. Nicholas Buildings, Newcastle-on-Tyne.

Seaford West Company, Ltd.

Registered June 15th to acquire land, buildings, tenements and hereditaments in Sussex or elsewhere; in particular, to acquire certain lands and hereditaments in East Blatchington and Seaford; and to carry on the business of builders, decorators, contractors, carpenters, stone, sand, lime, cement, brick, timber and hardware merchants, paviors, land, house and property dealers, &c. Capital £24,000 in £1 shares. The first directors are R. Lambe, W. Lambe, T. Lambe and R. F. Lambe (all permanent).

William Brown & Co. (Ipswich), Ltd.

Registered June 17th to acquire the business of timber slate and coal merchants carried on at Ipswich and Woodbridge, Suffolk, by E. J. Brown, P. Brown and A. Brown, under the style of William Brown & Co., and to carry on the business (both wholesale and retail) of merchants of and dealers in timber, slate, tiles, stone, sand, lime, bricks, hardware, tar, plaster, cement and other building materials, &c. Capital £50,000 in £5 shares. The first directors are E. J. Brown (chairman), P. Brown and A. Brown. Registered office: Friars Road, Liverpool.

Bow Common Estate Company, Ltd.

Registered June 19th to acquire certain lands, messuages and hereditaments in the parish of St. Paul's, Stepney, devised by the will of the late William Cotton, and therein referred to as the Bow Common Estate; to lay out the same or any other lands acquired by the company for building purposes; and to carry on the business of builders, contractors, financiers, property owners and dealers, &c. Capital £112,000 in £10 shares. The first directors are A. B. Cotton, R. B. D. Acland and A. E. Cotton.

London and Provincial Estates Ltd.

Registered June 21st to carry on the business of land and estate owners, builders, contractors, surveyors, auctioneers, agents, brickmakers, &c. Capital £8,000 in £1 shares (4,000 five per cent. cumulative preference).

COMING EVENTS.

Saturday, July 6.

Northern Architectural Association.—Student's Sketching Club Excursions.

Tuesday, July 9, to Friday, July 12.

British Association of Waterworks Engineers.—Annual Meeting at Birkenhead. Inaugural Address by the President, Mr. W. A. Richardson, M.I.C.E. Mr. William Ingham, A.M.I.C.E., on "The Design, Construction and Cost of Service Reservoirs." Mr. William Watts on "The Pollution of Public Water Supplies." Mr. A. G. Cloake on "French Practice in the Manufacture of Cast Iron Pipes." Mr. William E. Plummer, M.A., F.R.A.S., on "Rainfall, the Cycle of Precipitation." Visits to various works in the neighbourhood.

Saturday, July 13.

Architectural Association.—Third Summer Visit to Medmenham Abbey, &c., and "Danesfield," both at Great Marlow, by permission of the Architect, Mr. W. H. Romaine-Walker.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

JULY 10, 1901.
No. CCCXXXV.

EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

EVERY WEDNESDAY, PRICE 2D.

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Competitions, Contracts, all Notices issued by Corporate Bodies, Local and other Boards, Prospectuses of Public Companies, and Trade Paragraph Advertisements : Per Line	0	9
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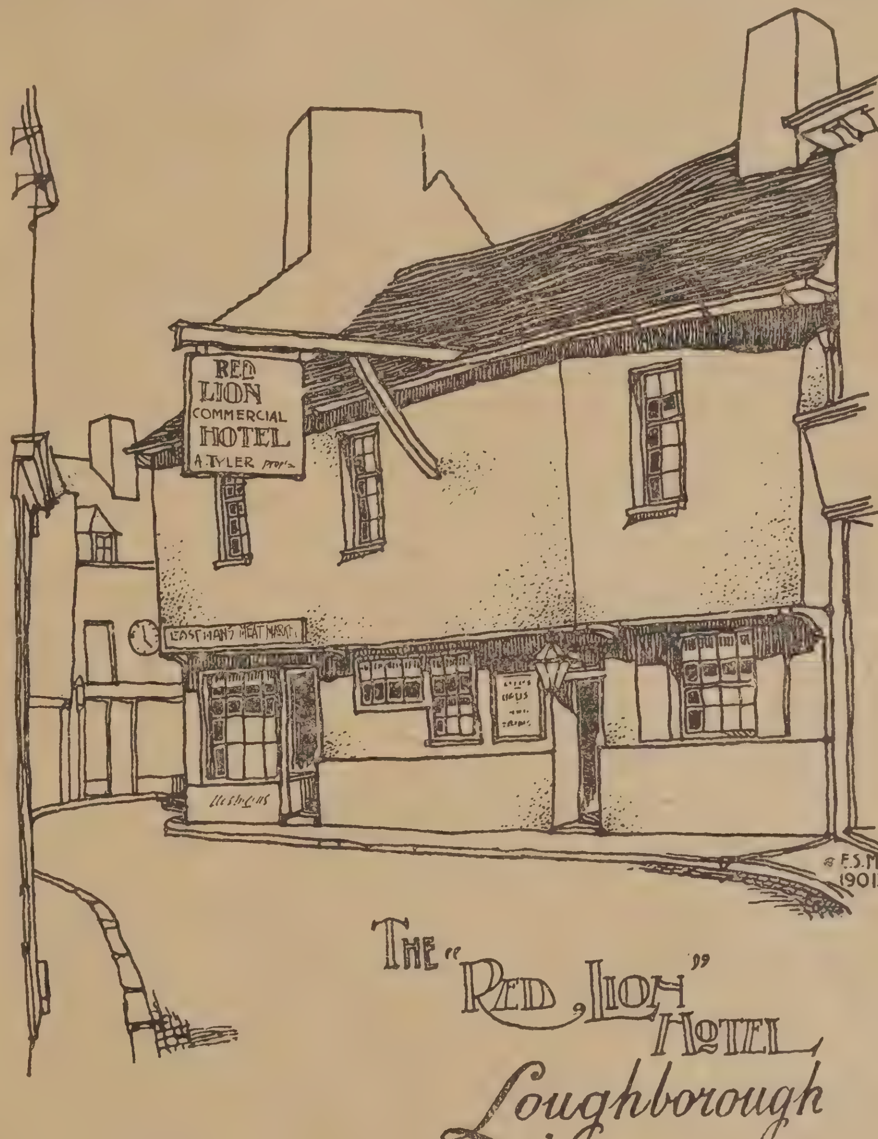
An Architectural Causerie.

A Further Protest. THE competition for the reconstruction of the Royal Infirmary at Glasgow has caused more dissatisfaction than any other recent competition. We have already given from time to time reports of what has taken place in connection with it, and this week we publish a copy of the letter sent to the Executive Committee by the Glasgow Institute of Architects further protesting against the conduct of those gentlemen who considered themselves better judges of architecture than Dr. Rowand Anderson, their assessor. It will, perhaps, be remembered that, as a set-off to the outcry raised against their decision, the Executive recently published an official statement, which, however, did nothing but confirm the opinion that the Committee had acted wrongly, a statement which drew from Dr. Rowand Anderson the stinging reply published on p. 362 of our issue for June 12th. The Glasgow Institute of Architects are now more than ever convinced that the plans as adopted "are in many vital particulars inadequate and out of date," and that if the reconstruction is proceeded with according to these plans the infirmary will not conform to the most modern standards of design in this class of building; they, therefore, urge the Executive to have the plans submitted to one or two independent authorities of standing for consideration and report, at the same time offering to pay for such expert opinion if it does not bear out their contention. For having worried the executive in this way the Glasgow Institute deserves much praise. The Committee have grossly blundered, but it is fortunate that someone is willing and zealous enough to continue to protest against their action till matters are remedied. We consider the Institute's offer a very reasonable and proper one, and we hope that the Executive will be wise enough to accept it. Competitions are only justifiable when conducted on equitable lines. When they are abused—like this one has been—they become intolerable.

Queer. ANOTHER complaint about a competition has reached us. Our correspondent states that a short time ago he sent in designs for a cottage hospital at Southwold. A few days afterwards they were returned by the secretary, who said that his committee had resolved to send back all plans as they did not comply with the conditions as to cost, no awards being made for the same reason. Our correspondent then wrote stating that his estimates had been under the supervision of a quantity surveyor, and asking the committee to allow him to submit a detailed estimate, in reply to which the secretary said that the competition had been closed and that other arrangements had been made for building the hospital, so that the proposal could not be entertained. With such insufficient data before us it is impossible to form a just estimate of the case, but the summary closing of the competition by the committee certainly seems to demand some explanation.

Sketch at Loughborough. LOUGHBOROUGH, about twelve miles from Leicester, is now a very busy centre for the leather trade, electrical works, &c., which mean employment for thousands of workmen; but these factories have quite spoiled the town—in fact, it now consists of rows and rows of dwelling-houses, all of similar design. Mr. E. Stanley Mitton, whose drawing of the "Red Lion" Inn we reproduce on this page, says: "One of the best buildings that have been erected of late is the bank in the Market Place. I believe the design was by Messrs. Goddard & Goddard, of Leicester. The chief feature of the town is of course the church, erected about 1500, which towers up out of the block surrounding it. The domestic work is very scattered. The 'Red Lion' is a fair example of old Loughborough: the quaint signs reach across the road in places. One gets a charming fragment down Woodgate; the thatched roofs and whitewashed walls, with half-timber construction mingled into one design, form a delightful group. Outside the town there is good sketching around Stamford."

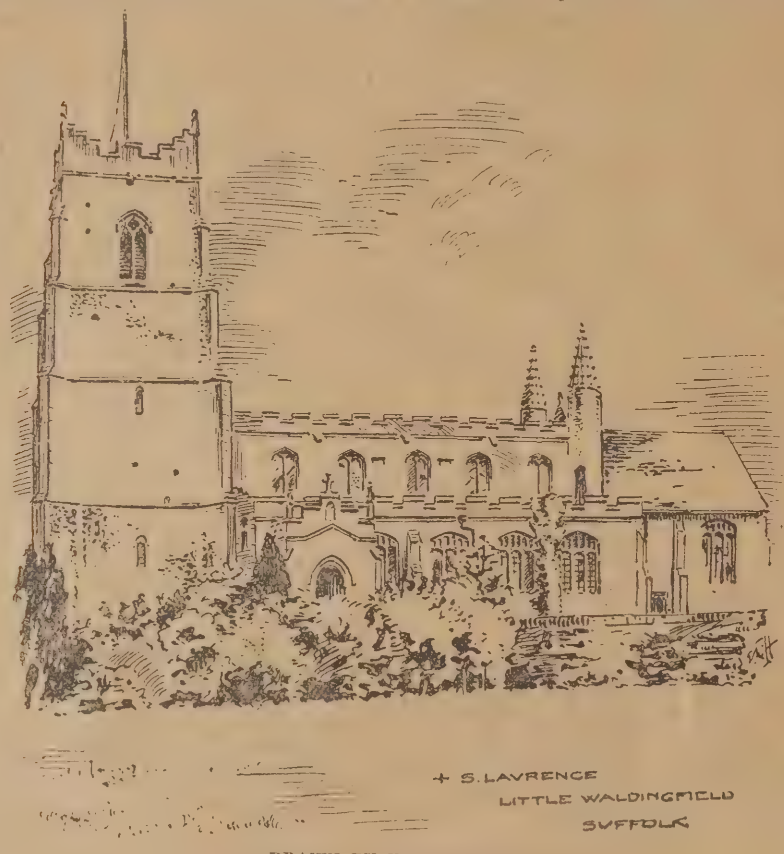


DRAWN BY E. STANLEY MITTON

Talk! Talk. A CERTAIN class of architects are never weary of talking of the evil practices of their fellow-workers. They are harsh critics indeed, and anyone who has not become hardened to their vapourings is bored to death and perhaps made despondent. These talkers are always looking for the motes in their brothers' eyes; but their chief offence is their hypocrisy, for in actual practice they have not the courage to follow the modes which they aver at public gatherings are the only true modes. No greater offender exists in the realm of architecture than the man who prates about things which he has not the slightest intention of putting into practice. There are men within our knowledge occupying prominent positions in the artistic and architectural world to-day (some of them charged with the duty of instructing the youth whom every president describes as the nucleus of a national style) who never practice what they preach—men who prate about truth in architecture and employ false half-timber construction; who hold up to scorn the architect that wickedly designs a building which he cannot personally superintend, yet err themselves in this respect on the very first occasion. We have had enough of their tattle. They weary us. What is needed is less talk and more work; less captious and rhetorical criticism of men who are trying to produce work of their own personality; less idealistic nonsense. Of ideals in architecture, as in socialism we have abundance. It is honest efforts towards realising them that we lack. When trade architects and the loquacious idealists see the folly of their extremes, and discard humbug for honesty, we shall see more beautiful buildings in our midst; but not till then.

LITTLE WALDINGFIELD CHURCH.

NOTHING is more characteristic of rural England, as it dwells in the memory of its people or presents itself to the Colonial or American rambler, than the country churches which lie far and wide in our villages, each a centrepiece to the picturesque cluster of tiled and thatched cottages whose own well-preserved age emphasises the cherished antiquity of the ecclesiastic building. A commercial age has somewhat militated against the extraordinary significance which the spire of the village church held in days when agricultural enterprise and the agricultural population was the base upon which the nation's strength and prosperity was built; but we still regard the country villages as the birthplace of England, and perhaps the changing ideals of the forefront of civilisation has added a certain preciousness to the true rural atmosphere, and has enhanced the general delight with which such scenes are viewed, and the untiring diligence with which the country village, unsophisticated by the implications of commerce, is sought out and made famous in the repute of holiday-makers and those who travel for pleasure and recreation.



DRAWN BY E. M. HICKS.

Little Waldingfield is just such an one of those retiring rural nooks which still lie undiscovered to the ordinary traveller; and its church is just such another of those fit and inconspicuous, though graceful and interesting, buildings, which characterise many of our villages; and in whose annals are embodied the traditions of the neighbourhood with the history of its inhabitants.

Little Waldingfield, with a population of some 400, lies among the pretty Suffolk lanes about four miles north-east of Sudbury. It has lately been shown that East Anglia is justified in the claims that natives have long loved to boast; and that of men and women whom posterity has proved to have been of conspicuous genius, a greatly disproportionate number are of East Anglian birth and origin. The fact that Thomas Gainsborough was born at Sudbury offers a reminder of this rare productiveness of the locality.

The road from Sudbury Station to Little Waldingfield reveals to the traveller the large market-place and parish church, which is only one of three interesting old churches in the place, and farther upon the way the church at Great Waldingfield is passed upon the left hand. A mile and a half further Little Waldingfield and its church reveal themselves. Of the church, which is illustrated in these pages by Mr. E. M. Hicks's sketches, there is not much to be said. In common with most Perpendicular buildings, and therefore in common with a large number of the village churches of Suffolk, a fine scale and good proportions are the most conspicuous features of the building. As is usual with churches of this period, and in particular with churches of an unassuming character, the roof of the building is low pitched with fine oak beams and rafters, which are perhaps none the worse for being devoid of the carving, colour and gilding which was sometimes so lavishly bestowed upon the timber roof of churches and halls of the period of the Perpendicular style. Unfortunately, the roof over the chancel is hidden by the lath and plaster of a later and uninspired taste, but the building has at least escaped the modern stained glass by which in these days any private person is allowed to perpetuate his own name under pretext of raising a memorial to a friend or relative. There has, indeed, been a window lately added, the work of a firm who have won a deservedly conspicuous place as designers and makers of modern church windows; but, except for this, the precious remnants of ancient stained glass which are scattered throughout the church have not been visited with any such ruthless treatment of restoration as has been dealt to its more ornate neighbour at Lavenham.

The altar and pulpit, which form the subject of two of Mr. Hicks's sketches, belong, as will be seen, to a later period than the church, and seem to owe their design to a homely rural appreciation of the designs of Elizabethan and Jacobean architects. There is also a reading-desk in this church of a similar design and craftsmanship, and there is one of those pleasing baluster altar-rails which, in a Gothic church, strikes the keynote of a new vogue which is rarely inharmonious. The chest and the door will be seen to belong to the years that raised the church with its battlemented caps, flat and somewhat coarse arch mouldings and attenuated labels. There was a priory attached to this church, which is now the rectory; but beyond a vaulted crypt below what was once the refectory, and glimpses of an open timber roof, there is little that recalls the Gothic origin of the building.

EXPERTS: A NEW CLASS.

THE technical expert holds a recognised place in the practice of architecture, which has become a much more complex business than it was in the century recently closed. As a necessary intermediary between the architect and the tradesman, the expert occupies a position that at one time was held by the foreman of the builder—say a carpenter or plumber. Any part of the construction that called for a more than usual amount of skill, such as the construction of a roof of wide span, or any ironwork, was left to the foreman to supervise, under the architect's general control, in the buildings of the day. We have now buildings in which the design, the structural work, the heating and sanitary arrangements, the electric wiring and light installations, hydraulic lifts, &c., are far beyond the acquirements of skilled mechanics. A new order of men possessing a higher standard of education, and who have been trained specially for these branches of construction, have arisen, to whom the architect has to trust special departments of his work.

May it not be worth while to consider the advantage or otherwise of the employment of experts in these special branches of construction, as colleagues or assistants of the architect? The late Sir Charles Barry and Sir Gilbert Scott engaged expert engineers to assist them in the design and construction of certain structural works, such as the great iron roof over St. Pancras Station of the Midland; and many of the principal iron roofs designed by architects have been supervised by experts. Sir Gilbert Scott called in Mr. Shields to assist him in the ironwork ties, &c., required in the restoration of Salisbury spire. For a building with a large roof of iron or steel construction, expert assistance in the supervision, and perhaps also in the design, appears absolutely necessary. We cannot expect the architect to know the proper size of sections for steel principals, struts or tie-rods; the best detail for a hinged joint, or for the seating of a long girder to allow for changes of temperature. Such details for a large span are better left to the structural engineer.

A building with complex ironwork affords a good opportunity for a division of skill and experience. The more complex the building, the greater is the need of expert supervision. A modern hotel with all the accessories of hydraulic-power lifts, electric lighting, sanitary fittings, and warming and ventilating arrangements; or an "up-to-date" theatre with fire-resisting appliances, hydraulic appliances for stage, fire extinction, ventilation, machinery, &c.; or a block of city offices fully equipped with the latest arrangements for warming, lighting and ventilating—is beyond the ordinary duties imposed on the architect. In the arrangement and details of these appliances he must seek the opinion and experience of the specialist, or leave them uncontrolled to the contractor or tradesmen. As the bricklayer, carpenter and mason require the guidance of the foreman, so the tradesmen who contract for the fixing of the hot-water pipes and apparatus, hydraulic-lifts or electric power and lighting installations naturally fall under the control and supervision of men who are experts in these branches.

Then there are the items of extra cost and labour to be considered. The engineering arrangements of public buildings like workhouses, asylums, hospitals, necessitate careful plans and estimates. The cold and hot water-supply, heating, lighting and power arrangements form, as we have been reminded, important items in the expenditure. Who will say that the architect is able to arrange these matters satisfactorily? Expert advice in the carrying out of the scheme would often make a considerable saving in the cost.—("American Architect.")

A New Jewish Synagogue at Brynmawr has been built on the Heathcock Tump, in Bailey Street, according to the plans of Mr. W. S. Williams, architect, of Tredegar, by Mr. John Jenkins, builder, Brynmawr, at a cost of £750. It comprises a classroom and ante-room in addition to the synagogue. It is seated with pitch pine, stained and varnished, and has a gallery at the west end for the female portion of the congregation. It is lighted by gas fittings with incandescent burners and shades erected by Mr. A. E. Webb, Brynmawr.

A LEADING FRENCH ARCHITECT —J. A. BOUVARD.

By RENÉ DE CUERS.

WHEN M. Alphand died the people of Paris experienced a thrill of sorrow with which was mingled a certain amount of anxiety as to who would venture to assume the onerous task of taking his place. Parisians still retained a vivid recollection of the wonders he had achieved in 1889, at the time of the Universal Exposition. It was he who drew, or supervised the drawing, of all the plans; it was his magic wand that caused buildings to spring up, galleries to extend themselves, and nearly 200 acres of bare ground to change into a veritable city—a city of which all the streets were gardens and all the houses palaces.

But the public were quickly reassured. It was known that M. Alphand had been wise enough and disinterested enough to train a number of pupils, not wishing, as some selfish men might have done, that his work should perish with him; and from the ranks of the army of devoted collaborators who had helped him in his gigantic and courageous enterprises there stood forth one name which met with almost unanimous approval—that of M. Bouvard. Rarely has a choice been more completely justified, as will be seen from the following account of the career of the talented architect who was chief of the Architectural Department of the Exposition of 1900.

M. Bouvard was born on February 19th, 1840, at Saint-Jean de Bournay, in the Department (County) of Isère, and became an orphan at the age of eleven years. Having entered the office of an architect of Vienne he soon acquired a passionate fondness for his art.

But the field of study which offered itself to him there was too limited, and, like all artists who desire to see and learn, he made his way to Paris, where he was admitted into the Ecole des Beaux-Arts. When he left that school he was the possessor of several first-class medals. One of his masters, M. Constant, detecting special aptitude in his youthful pupil, made a friend of him, and this valuable intimacy has had a happy influence upon his after-career.

In 1864 M. Bouvard entered the service of the city of Paris as conductor of the works of the church of St. Laurent, to which was then being added its present main doorway, in the Gothic style. Soon afterwards he took part, as Inspector of Works, in the erection of the new Town Hall at Belville, a district in the eastern part of Paris. During the war of 1870 M. Bouvard was in charge of all the works connected with the defence of the nineteenth and twentieth wards of the capital. But this participation in the struggle between France and Germany, however useful, did not seem to him sufficient, and, in the month of November, he left his post. which he considered too sedentary, in order to play a more active and more perilous part. He joined a company of foot and was wounded in the fight at Buzenval.

When peace came M. Bouvard wanted to resume his former position in the service of the city of Paris, but it was occupied. He was, therefore, obliged to wait. Under M. Constant Dufeux, he co-operated in the works at the Luxembourg Palace, and had immediate charge of the preparing of this edifice for use as municipal offices, the City Hall having been burnt down by the Communists in May, 1871. As a reward for these labours M. Bouvard was restored to his old position in the central administration of the city. From this period dates his connection with M. Alphand, who soon made him one of his most trusted auxiliaries, and from that time forward never failed to speak in the highest terms of M. Bouvard's activity and his talent as an architect.

When the Senate and the Chamber of Deputies quitted Versailles and returned to Paris the various services of the Prefecture of the Seine had to be transferred to the Tuileries, and it was again M. Bouvard who was entrusted with the fitting up of the portion that still remained of the former imperial residence. Within three weeks the Pavilion de Flore was ready to be used for its new purpose. This was a great feat, and the city government did not stint its praises to the skilful architect who had so cleverly rescued it from an awkward predicament.

These several pieces of work had not yet brought M. Bouvard in contact with the public, but the Exposition of 1878 provided him with an opportunity to draw attention to himself. Already, at Vienna in 1873, at London in the following year and at Brussels in 1876 the assistance rendered to M. Alphand by his lieutenant had been remarked, and expositions had almost become his specialty. Consequently, when, acting on the report of M. Viollet-le-Duc, the City of Paris determined to show visitors to the Exposition the machinery of its organisation in a special pavilion, M. Bouvard seemed to everybody to be the proper man to erect that edifice.

Having only a limited sum at his disposal M. Bouvard wisely confined his ambition to providing a good lodging for the city's exhibits. Nevertheless he constructed a pavilion which was sufficiently agreeable in appearance to save it from destruction when the Exposition came to an end. The City of Paris's building was dismounted piece by piece and reconstructed on the Champs Elysées, where it remained until torn down in order to clear the ground for the Exposition of 1900.

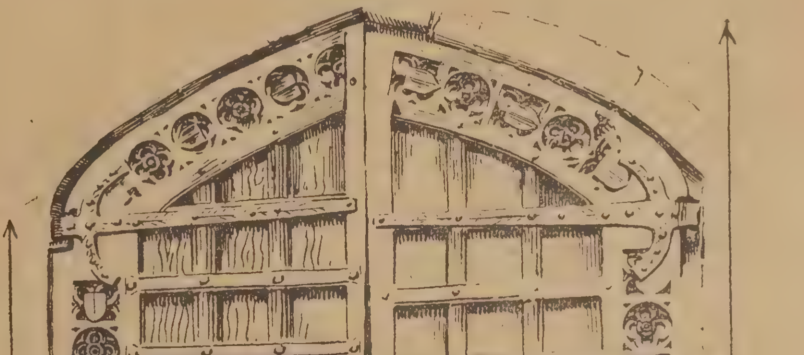
When the Primary Education Act was passed in 1882 M. Bouvard was charged with the duty of providing speedily the means to enforce it in the city of Paris. This afforded him an occasion to achieve another feat. In less than six months he built fifty-two temporary schools. Simultaneously with this pressing work our indefatigable architect undertook the erection of a large number of permanent schools which were planned according to a general programme based on considerations of economy, hygiene and pedagogy.

M. Bouvard's work is extremely varied, and he does not disdain any subject. Thus, besides the examples already mentioned and those described further on, we see him undertaking the reconstruction of the entrance gate of the Carnavalet Museum.

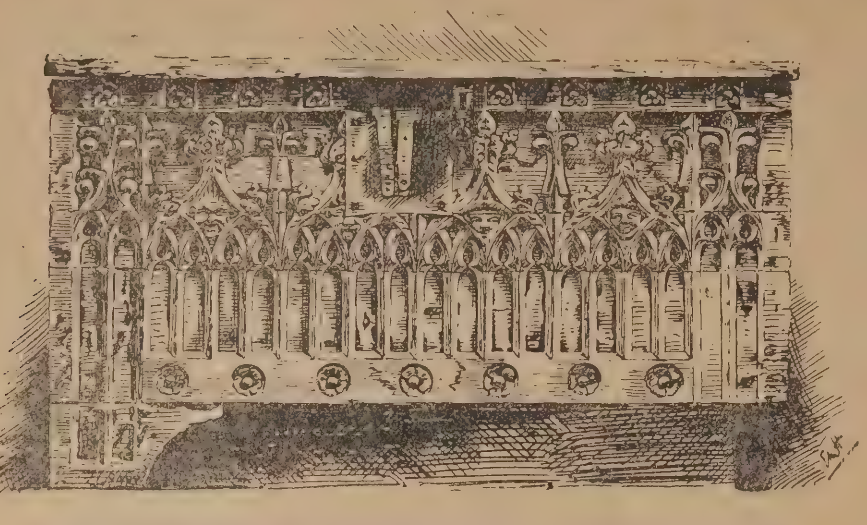
The old Carnavalet mansion, which was occupied for some years by Madame de Sévigné and her daughter, is the property of the city of Paris, which has transformed it into a museum intended to contain everything in the way of fragments of architecture, books, publications, and so forth bearing on the history of Paris. The entrance-gate having to be remade, the task was entrusted to M. Bouvard, whose work was especially delicate from the fact that it was necessary to keep close to the sentiment of a piece of architecture which is regarded as a model of its kind. Consequently, the congratulations he received were all the warmer when it was seen that he had coped successfully with the difficulties of the undertaking.

The Universal Exposition of 1889 furnished a further proof of the suppleness of M. Bouvard's talent, for there he was called upon, with the eyes of his master, M. Alphand, benevolently watching him, to design the Palace of Various Industries, and the much-admired central dome.

The latter presented a peculiarity worthy of notice. Instead of being lighted, as is customary, by a skylight turret, its upper part was solid, while its lower part was glazed between the trusses. Such an arrangement would be inapplicable to a stone edifice, but with metal it became both easy and rational. It had, moreover, the advantage of admitting daylight into the interior of the cupola under conditions which showed up its extreme lightness and set off its multi-coloured decoration in the best possible manner.



NORTH DOOR (INSIDE), LITTLE WALDINGFIELD CHURCH. DRAWN BY E. M. HICKS.



OLD CHEST, LITTLE WALDINGFIELD CHURCH. DRAWN BY E. M. HICKS.

In 1878 M. Bouvard had been created a Knight of the Legion of Honour, and for his central dome he was rewarded with the Officer's Cross in that distinguished order. It was a well-merited recompense for the industry of an architect who, while achieving such results at the Champs de Mars, had found time to construct at the other end of Paris an edifice which subsequently was destined to acquire great notoriety. We refer to the Bourse de Travail, which was founded by the municipal council for the use of working men's organisations, and which had afterwards to be closed by the Minister of the Interior, M. Charles Dupuy.

This establishment is situated near the Place de la République. It consists of an underground basement, a ground floor with partial entresol and five storeys above. Its length is 361·3 meters, and it is 40 meters in depth. The principal departments are grouped around a central courtyard, whence they receive light, the irregularities of the perimeter, which is bounded by party walls, being utilised for the subsidiary services, exit staircases, water-closets, air shafts, &c. Three large doors give access from the street to a spacious vestibule communicating with a gallery, which leads to all the ground floor offices and to the four staircases, by which the basement and the upper floors are reached. In the centre is the large glazed courtyard, arranged as a hall for holding big meetings. The principal rooms are so disposed as to allow them to be thrown into this hall when special mass-meetings are held.

This article would be incomplete if, before showing M. Bouvard in his role of decorator of the city and organiser of all the grand fêtes, we did not say just a word concerning the municipal disinfecting ovens which have been built after his plans, in the Rue des Récollets, near Saint Martin's Canal.

This establishment is arranged in a most ingenious manner, and the architect has strictly followed the programme laid down. There is a complete separation between the articles to be disinfected and those already purified. The establishment has two doors, one for bringing in the infected articles, opening on to the arrival courtyard, and the other for the removal of the disinfected articles, which opens on the departure courtyard. All contaminated articles that are transportable are brought to the stoves in air-tight conveyances. The articles are immediately disinfected and then carried back to the house whence they came in different conveyances and by different men from those which brought them. After each operation the conveyance used for transporting the infected articles undergoes disinfection.

It is certainly remarkable to see that an architect who is able to organize such a prosaic establishment as this, even its smallest details, is equally capable, when required, of transforming himself into a clever scene-setter and giving an artistic stamp to the embellishments (sometimes ephemeral ones) of the city. This invaluable aptitude has displayed itself on two occasions in particular, in the month of October, 1893, when the Russian Admiral Avellan came, and in 1896, when the Russian sovereigns visited Paris.

In 1893 it was a veritable scene from fairyland which presented itself to the countless multitude of people assembled in front of the Hôtel de Ville. Among the most pleasing of the motives were two ships, designed by M. Bouvard. They were flanked on the right and left by pylons supporting immense shields with the Russian arms on them. Around these pylons were maritime engines bearing commemorative inscriptions. On board these ships were orchestras and choirs, which discoursed an admirable programme of music while the banquet of 600 covers, presided over by M. Carnot, was taking place inside the Hôtel de Ville. At half a score of other points in Paris M. Bouvard gave proofs of the versatility of his imagination, and the luminous pylons which he installed on the Place de l'Opéra, near the Military Club, where the Russian officers were lodged, elicited unbounded admiration from the vast crowds which congregated at that spot.

In 1896 it was again at the Hôtel de Ville that M. Bouvard distinguished himself. He surpassed all his previous efforts by the magnificent display which he prepared for the occasion of the reception of the Russian rulers. Within the Hôtel de Ville there was an unprecedented profusion of lights and flowers. A grand staircase was improvised in the great central courtyard, in order that the illustrious visitors might proceed direct to the hall where stood the monumental vase presented to the city by the Tsar Alexander III. Outside M. Bouvard confined himself to garnishing the principal entrance with a rich awning, so as not to disfigure the fine facade of the edifice by overloading it with ornamentation. On the square, in front of the building, two hemicycles with elegantly designed colonnades were erected for the choirs. At the corners of the square rostral columns, with the city arms, and masts entwined with flowers and surmounted by the imperial eagle, completed the decoration.

Throughout Paris evidence is to be seen of his handiwork, sure and yet light. It is he who conceived the delightful notion of putting flowers around the trees at the Rond-Pont of the Champs-Elysées. The decoration of that avenue, the Place de la Concorde and the Terrace of the Tuileries were also effected by him.

The Government, urged by public opinion, not long ago set a new seal upon M. Bouvard's reputation by conferring on him the grade of Commander in the Legion of Honour. This is probably not the last distinction which will be bestowed on this gentleman, who, in the midst of his heavy labours, is always urbane and good-humoured.

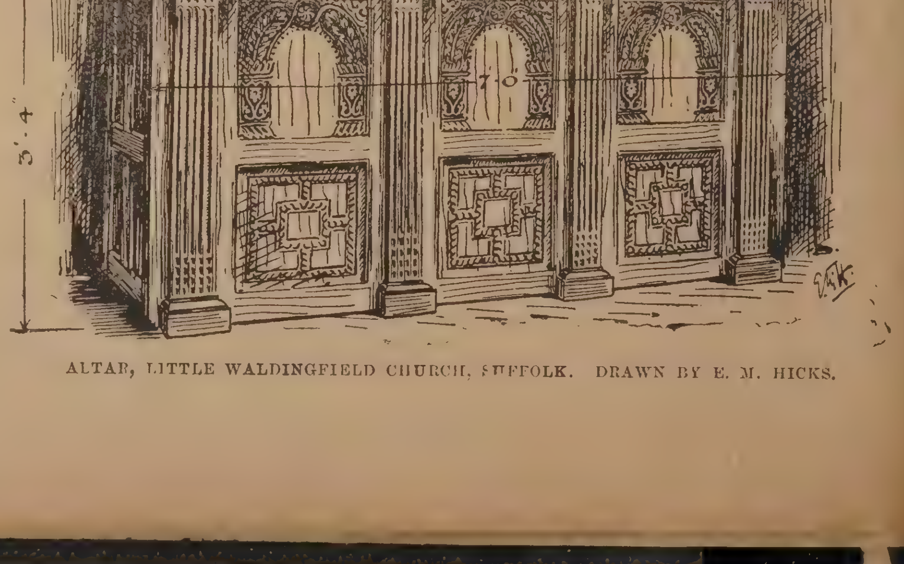
DOMESTIC ARCHITECTURE IN AMERICA.

By A Well-known American Architect.

SPEAKING of American domestic architecture Mr. Frank E. Mead, of the well-known firm of Philadelphia architects, Keen & Mead, says in "Carpentry and Building":—

The change in taste in country-home building is most marked and gratifying. There is at present a decided tendency to make the residence and its surroundings an artistic whole. This tendency has developed very recently. A few years ago the average home builder was content with a very ordinary house with ordinary accommodations. If there was any attempt at æsthetic adornment, it found expression in tasteless tinsel and hybrid decorations that bore no relation to the purposes of a home or any ideal of art.

This is all changed now. Every man who is building a country house wants the architect to embody artistic principles that are basic. He wants his house livable. He desires primarily to plan his house to fit its surroundings. He demands the combination of comfort, convenience and utility with a harmonious artistic effort. Dignity in simplicity is the keynote of the present tendency. It is the keynote of success in architecture, as it is in everything in life. This tendency is taking us back to the old Colonial principles in house construction And therein is being laid the foundation of a



ALTAR, LITTLE WALDINGFIELD CHURCH, SUFFOLK. DRAWN BY E. M. HICKS.

greater architecture than the world has known, with the possible exception of the Greek. Conditions in America are specially suited to such a development.

Natural Aids.

There is no more beautiful scenery in the world than you will find outside Philadelphia. The climate is equable. Practically everything grows—an important feature in the development of your architecture on lines of co-operation with nature. Every country house now wants its garden. The love of flowers demands concentrated organisation. Here is a decided reversion to old Colonial days. The best examples of floral development about the country house to-day are seen in quaint Colonial gardens, with winding paths, trim box rows, cool nooks and corners, flowers and shrubbery.

More attention is being given to the location of the house, so as to take advantage of environing scenery. Every detail of comfort and pleasure is worked out with exacting care. Bedchambers and living rooms must face south, or south-west, if possible, giving the fullest advantage of summer breezes and protection from the north winds in winter. The modern architect is no architect at all unless he is a landscape gardener as well.

A Reversal to Old Colonial Principles.

The new country house of Samuel Megargee near Bryn Mawr, illustrates the radical reversa toward old Colonial principles, the best extant examples of which are seen in the James River Valley in Virginia and in old Chester county farms, with their heavy masses of white columns supporting the heavy overhanging roofs. There is a total absence of anything ornate for its own sake. Whatever decoration is there is thoroughly simple and structural. This applies both to the exterior and interior. The highest art is gained by a rigid conformity to nature. Gingerbread decoration is, fortunately, dying out. The people really want better art than they can get, or could get heretofore; for it is the fault of the architects themselves that we have had a gingerbread architecture. The people really want a combining of wholesome, strong, simple effects, and especially good livable things, with fair and moderate cost. And that is what the present generation is getting at last.

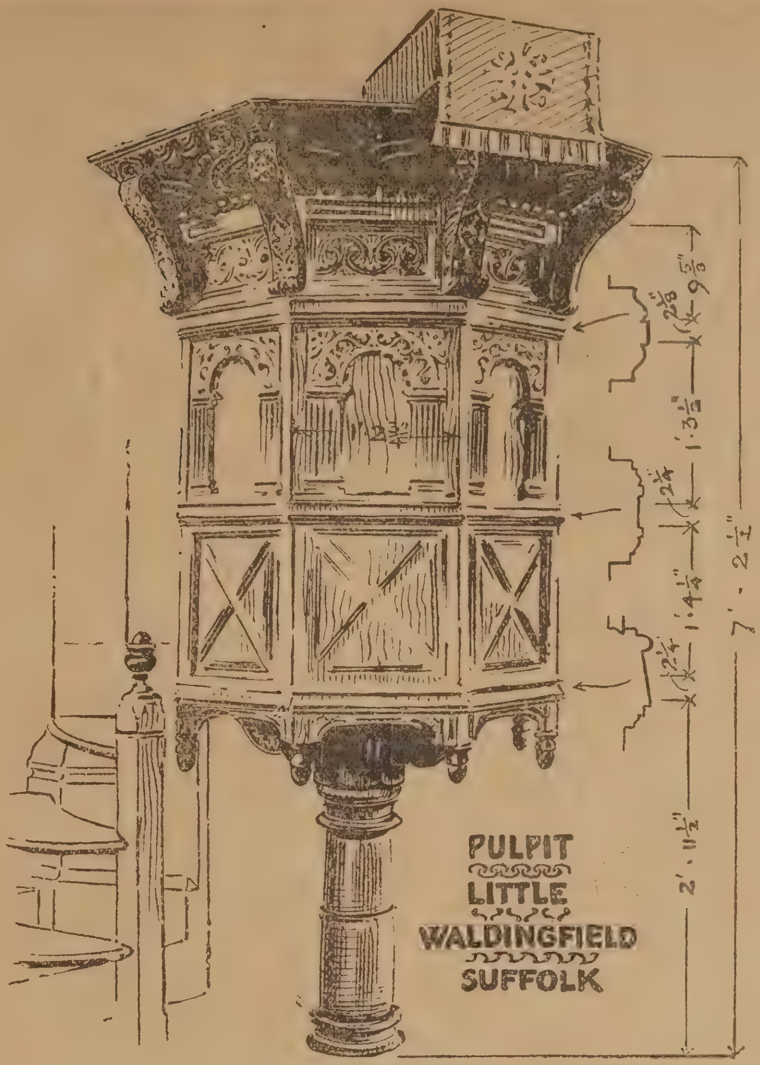
A fine example of the tendency back to the old Colonial principles is seen in the Red Rose Inn at Villanova. Here is exemplified pure common-sense in building. It embodies the Colonial ideas in the selection of the site for advantageous scenic effect; the beautiful garden adjoining the house; a thoroughly simple and well-built house, with heavy timbers showing inside and outside; dry and well-seasoned lumber, well-burnt bricks, great columns, heavy doors, large and airy windows, with small panes of glass, ponderous exterior chimneys and great massive roofs of unbroken shingles.

The early Colonial was based on Doric ideas, which were extremely severe. Inside you had the large airy halls, giving a big sense of welcome and hospitality. You had the great living-rooms, with their wide generous fireplaces filled with the heavy pungent logs. The colour treatment was borne in mind as shown in the Megargee house. The basic line of the exterior is white, the great shingle roof being stained a dark old greenish-brown, reproducing a weather-beaten effect.

Modern Changes.

The most marked tendency in present interior construction looks to the entire elimination of the parlour. Ordinarily, the parlour is a useless room. The great central hall is the thing nowadays. The plan of dividing houses into a lot of little uncomfortable apartments is giving way. That means that the house now boils down to a great open central hall, combining in itself all necessary things, with library and living-room in one. About the great fireplace are lounging seats. There is plenty of fresh air, and comfortable easy stairways open to upper floors. This is an important step in the common-sense direction.

The dining-room is isolated. There servants can prepare the tables quietly and without disturbing those in the living-room. Of course, the kitchen is separated, and this is a most important apartment. Proper sanitation is here paramount. The architect must know a good deal about cooking and cleaning. The offensive odours of cookery must be taken into practical consideration.



DRAWN BY E. M. HICKS.

Houses are now getting down to two storeys, with servants' apartments in a partial third storey. Ventilation of the upper storeys, which are devoted to bed chambers, is receiving practical attention. Servants are receiving much more consideration than heretofore in suitable accommodation, including baths, &c.

Interior Decoration

is important. The tendency in country houses is toward quaint old effects, produced by a high simple wainscotting, brick and wooden floors, great fireplaces with massive andirons supporting heavy logs, large flues, which prevent smoking, &c. It is now quite common to follow the old Colonial method of carrying the side paper on to the ceiling, thereby producing another quaint effect.

In the use of the word "Colonial" I do not mean the present so-called Colonial architecture. The Colonial has been hashed beyond recognition. But, properly used, as indicating the fine old, simple, common-sense, livable construction, there is nothing more desirable in truly artistic house-building. And it is a notable fact, and a gratifying one, that the dominant tendency is back to this beautiful and comfortable and honest architecture of our sturdy forefathers.

The International Exhibition of Decorative Art which is to be opened in Turin next year will be held under the patronage of the King of Italy; and the committee of management has for its president the Duke of Aosta, and for its vice-president Signor Villa, president of the Italian Chamber of Deputies. The site of the exhibition will be in the Valentine Park, where the Italian exhibition of 1898 was held. All practical applications of decorative art will be included among the exhibits.

WORKMEN'S HOME AND CLUB AT LIVERPOOL.

AN EXPERIMENT.

A WORKMEN'S home and club and public hall is to be erected in Liverpool by Mr. B. W. Levy out of the moneys of the David Lewis Trust Fund, somewhat on the lines of the People's Palace in London. The site is that upon which old St. James's Market stood. The building has just been commenced, and is estimated to cost £50,000. Mr. J. Francis Doyle, of Liverpool, is the architect. The main frontage, in Great George Place, will extend 174ft. The side frontage, in Nile Street, will have a length of 146ft. In all, the site measures 220ft. by 176ft., and the buildings will be set back from the boundary about 21ft. The architecture may be called a free adaptation of the Renaissance. The materials used in facing the main outer walls will be a special brick and terra-cotta, with green slates on the roof. The main entrance to the public hall and clubroom will be from Great George Place, and will be 12ft. wide. The hall itself will be 90ft. by 42ft. and 35ft. high. It will be in the centre of the building, and will accommodate 800 persons.

The club will consist of a number of large rooms—a billiard-room 67ft. by 30ft.; two committee-rooms, three social clubrooms, each 50ft. by 26ft.; and also a special clubroom and toilet facilities for females. To the south of the clubroom, on the same side, ample space is left for the subsequent erection of a gymnasium 132ft. by 54ft. The home will be entered from Nile Street through turnstiles. Just over the threshold the visitor will find himself at the office, and adjacent to this will be the master's house. The quarters assigned to the superintendent in the north-east corner of the building will be commodious and conveniently placed. The halls and corridors will be very spacious, the fireproof main staircase being 21ft. sq., with a hall 21ft. by 20ft. The reading-room will be 50ft. by 20ft. In a central position between this room and the dining-room, with an area of 20ft. by 15ft., will be the provision shop. There will be lifts connecting the shop with the kitchens in the basement. The dining-room will be 80ft. by 41ft. It will contain two ordinary fireplaces and a special cooking fire, with a lodgers' scullery and every appliance which can count for comfort and cleanliness. The kitchens, sculleries, pantries and stores will be in the basement. In the basement will also be numerous lockers, and storerooms for the accommodation of articles belonging to the boarders at the home. On the upper floors, approached from the large main staircase by three independent gangways, will be the sleeping cubicles. These will be arranged in groups for easy working and control. There will also be two other stone staircases. The number of cubicles for which arrangements have been made in the designs is 381. Over the billiard-room will be a large flat roof, which it is intended shall be for the use of the men who sleep in the home, and who will thus be offered an opportunity of getting fresh air under good conditions.

The club will not only be for the use of the boarders domiciled within the home, but also under certain conditions the inhabitants of the locality will be able to avail themselves of its privileges. According to present intentions, a charge of sixpence each per night will be made to occupants of the sleeping cubicles, who in addition to the lodging accommodation will, subject to good behaviour, be entitled to the advantages of the club. It only remains at present to add that the heating, ventilating and electric lighting arrangements are of the most modern, elaborate and efficient description. The work of erection has been entrusted to Mr. Isaac Dilworth, the clerk of the works being Mr. J. W. Gilling.

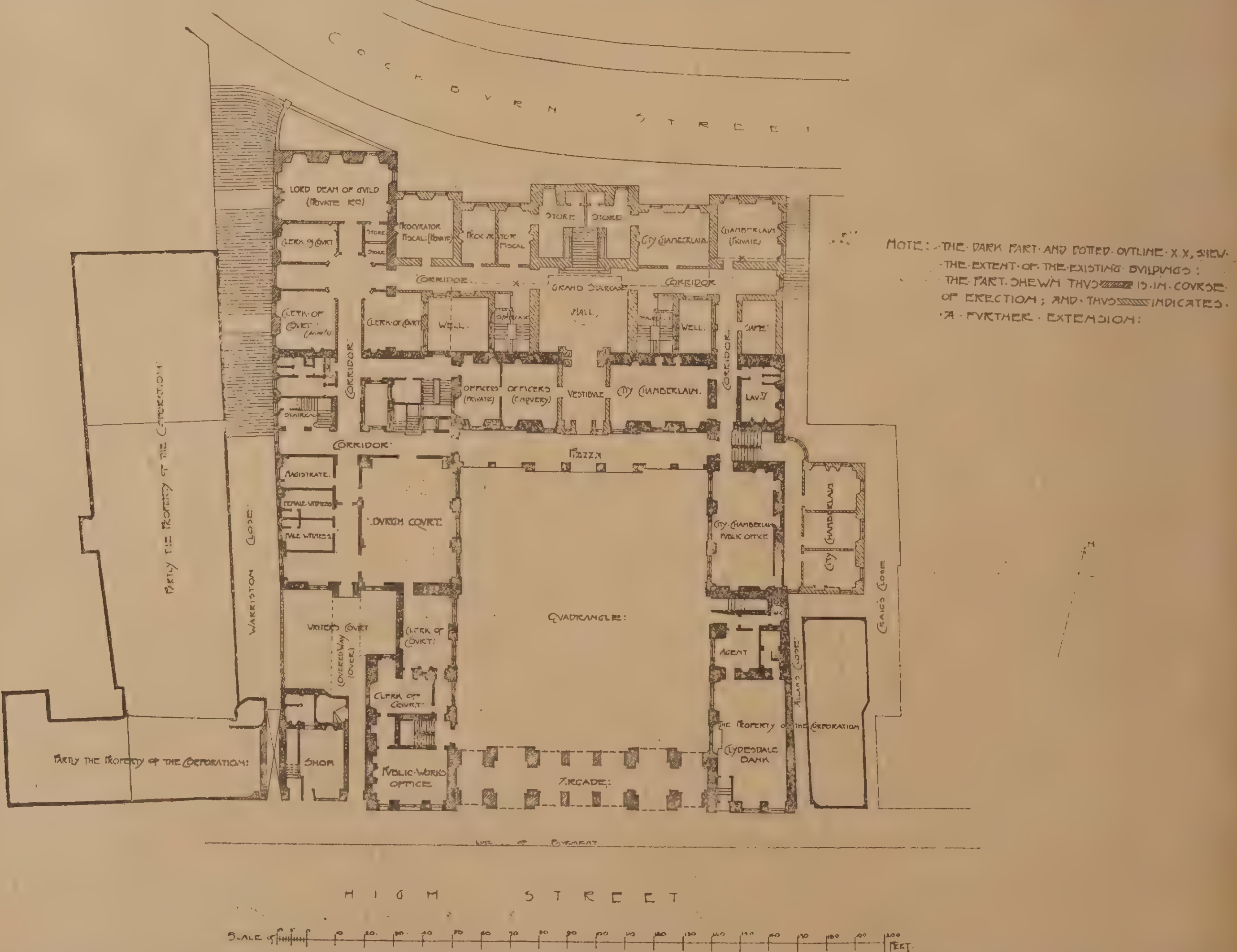
A NEW CHURCH FOR EUXTON.

A NEW Wesleyan Church is being erected at Euxton, Chorley. The buildings will consist of a chapel, with orchestra and vestry, and will provide accommodation for about 200 adults, or for a mixed congregation of about 240 persons. The principal elevations are to be faced with Accrington bricks, relieved with Lancashire stone dressings. The chapel roof will be partially open, being sealed at the collar beam, with visible timbers, wrought and varnished. The internal walls and ceilings are to be of plaster, and the internal joinery throughout will be of selected pitch-pine. The pews will all be open, being provided with solid bench ends. The floor will have a good rise from the rostrum. The orchestra is placed immediately behind the rostrum, and connected with the chapel by an arched opening. Ample space is reserved in the orchestra for the provision of a larger instrument than that now in use. All the church and orchestra windows will be glazed with lead lights of special designs. The heating of the building is to be by hot water, with low pressure. The architect is Mr. W. H. Dinsley, of Chorley, and the contractor Mr. William Hampson, of Chorley. The cost of the building will amount to about £1,300.

Edinburgh City Chambers Extension.—Plans are given on this and the opposite page of the two principal floors of the proposed extensions of the Edinburgh City Chambers and will explain the arrangements which are complicated by so much of the building being an adaptation of existing buildings, and so much new. There is the further peculiarity that the level of Cockburn Street, which the building fronts on the north, is from 65ft. to 70ft. below that of the quadrangle entering from the High Street. A perspective view of the Cockburn Street frontage was given in a double-page plate in our last week's issue.

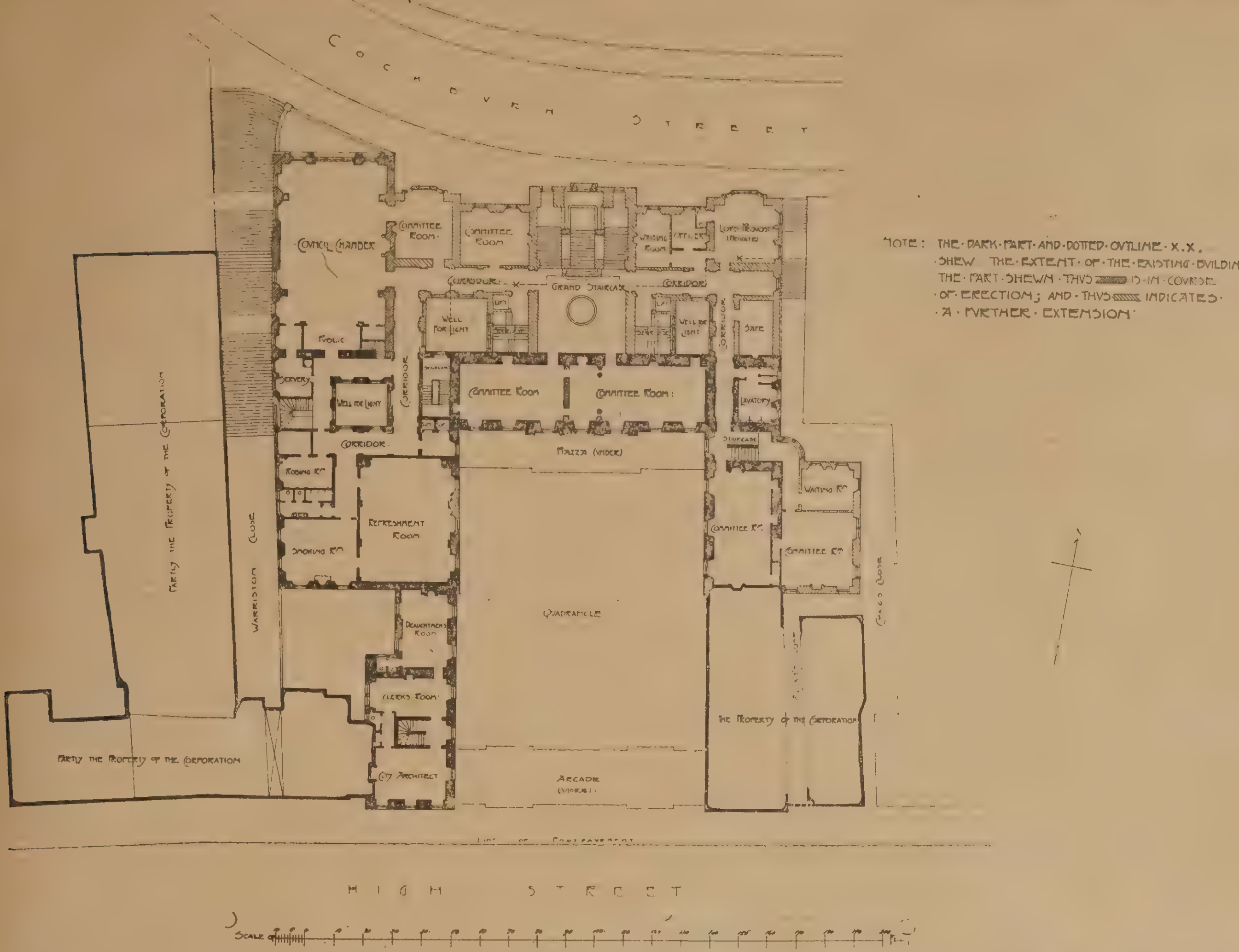
UNDERGROUND ARCHITECTURE.

HOWEVER interesting they may have been in other aspects, it does not appear that the Troglodytes or other Earth Dwellers troubled themselves much about the architectural character of their abodes. And yet it is probably from some prehistoric race of these peoples that the almost universal adoption of subterranean constructions was derived, producing in many cases works of stupendous magnitude. Many of the accounts of such that have come down to us have been discredited by modern critics, not seldom for no other apparent reason than that to some minds the primary meaning of a tradition is something to be disbelieved in. Whether there was truth or not in these old traditions, it is certain that at a very early date men had the idea of underground architecture. Herodotus tells us that in the time of Sardanapalus certain thieves anticipated Sherlock Holmes's Red-Handed League, and dug a subterranean passage from their own dwelling to the Royal treasure vaults. Zalmoxis, who was worshipped as a deity by the Getæ, is said to have acquired his supernatural reputation by having a secret underground dwelling prepared, into which, after asserting his own immortality, he disappeared for three years, after which he again exploited himself as proof positive of the truth of his boast. Demosthenes, again, is said to have acquired his powers of eloquence by constant solitary practice in an underground chamber which he had constructed for the purpose. In our own country there is the early tradition which tells of the underground palace made by Locrinus, son of Brutus, for his *chère amie*, the Saxon Princess Esynt. Beyond the fact that this palace was "in London," the old chronicles leave us in doubt as to its locality. There is no restriction on conjecture, so we may if we please associate this with that rather better authenticated product of underground architecture, the



Note:—The dark part and dotted outline x x, shew the extent of the existing buildings: the part shewn thus ▨ is in course of erection; and thus ▤ indicates a further extension:

EXTENSIONS TO EDINBURGH CITY CHAMBERS (MUNICIPAL BUILDINGS): PLAN AT BURGH COURT AND QUADRANGLE LEVEL. R. MORHAM, CITY SUPERINTENDENT OF WORKS, ARCHITECT.



EXTENSIONS TO EDINBURGH CITY CHAMBERS (MUNICIPAL BUILDINGS): PLAN AT COUNCIL CHAMBER LEVEL (FIRST FLOOR ABOVE QUADRANGLE). R. MORHAM, CITY SUPERINTENDENT OF WORKS, ARCHITECT.

passage which led from Baynard's Castle to a certain house on Paul's Wharf, which was occupied, so Court scandal averred, by another frail beauty, the famous "Fair Rosamund," whose royal friend was thus able to visit her without undue publicity. It is possible that Peel's old ballad, embodying some of the popular slanders against Queen Eleanor, wife of the first Edward, referred simply to supernatural agency, and was guiltless of any suggestion of underground locomotion. Those, however, who delight in discovering cryptic prophecies in unlikely places, may be of opinon that the Inner Circle or some other modern subterranean City railway is not obscurely hinted at. For what says the ballad?

> "At Charing Cross she sank
> Into the ground alive,
> And, after, rose to life again
> In London at Queenhithe"—

a description quite applicable to the royal lady taking a ticket at the former place, and being disgorged by the "elevator" at the latter.

There are, however, numerous traditions of other achievements of underground architecture which are not altogether or all unauthentic. There is the often-talked-of passage from Highgate or Hampstead to St. Albans, invariably associated with the redoubtable Dick Turpin. Certain traces are said to have been found, and of the many hazarded explanations perhaps the most plausible is that which suggests that it was the commencement, in Roman times, of an enormous military work between London and Verulamium. There was said to be an underground passage in connection with Sir Thomas More's house at Chelsea, though neither its destination or dimension seems to be known. Tradition asserts, too, that there was a similar way from the Tower of London to the Old Palace at Eltham; and a less shadowy authority declares that it was from a subterranean passage at Hampton Court that Charles I. effected his escape from the gaolership of Colonel Whalley. Relating to the other principal actor in the grim drama of rebellion and regicide is the tradition of an underground passage from Cromwell's house at Westminster, and readers of Dumas will not forget the effective use he makes of this belief in "Twenty Years After." It is only natural that many of these traditions of underground passages and dwellings should associate them with religious houses or churches, the obligations of sanctuary, the political importance of ecclesiastics, and the fluctuating relations between Church and State, making secrecy of transit and abode often absolutely essential. There was the alleged subterranean communication between Southampton and Netley Abbey; another between Warwick Castle and St. John's Priory; another between the Castle and Priory at Lewes. From the famous Abbey of historic Tewkesbury there ran, it was said, a passage underground to Malvern—possibly to the monastery founded there by the confessor.

From Durham Cathedral, "half church of God, half tower against the Scots," the monks could pass to the beautiful abbey of Kirkstall; from the stately Benedictine church at Reading, whose massive walls, 8ft. thick, had a circumference of half a mile, a similar passage ran, so the story goes, to Caversham. When any of the mighty Nevills, lords of Middlesham, needed ghostly counsel, it was said that a confessor could come, all the way underground, from the distant abbey of Gervaux; and the Percies or Seymours of Wressil could in like unseen manner attend mass or evensong at Howden Church, four miles or more away. The pious nuns of Watton, concerning whose rigorous discipline Fosbroke relates so many quaint particulars, were wont, tradition said, to attend the Holywell at Kilnwick, and there perform miracles of healing. But what doubtless seemed the greatest miracle of all was how they got there, till the mystery was put an end to by the discovery of a subterranean passage to the nunnery. From Guisborough Priory a tunnel ran for a mile and a half to a place called Toccotes, and in the midst of this, so we learn from Ord, was a mighty chest of gold. Easy enough to be plundered, it would seem, since its only guardian was a raven—but this raven, like Poe's,

> "Had all the seeming
> Of a demon that is dreaming,"

and when any venturesome wight approached with felonious intent, the seeming came true and the dreaming ended, and the Foul Fiend himself stood revealed. There was a passage, the old books tell us, between Someries Church and St. Mary's, Luton, and another from Newnham Abbey to the priory at Bedford, some two miles distant. This appears to be fairly well authenticated, and perhaps the same may be said of the tunnel between Larkbeare House, in Exeter, to the castle and cathedral, and of that between Sawley and Whally abbeys, in Yorkshire, stated to have been seven miles long, and of which traces are said to be found. Intervening water was as little of an obstacle in those days as now, always assuming the existence of these reputed passages. From Pontefract, for instance, a tunnel was said to run under the moat and have its exit at a mound a mile distant; and from Richmond Castle a similar passage led to St. Martin's Priory, on the other bank of the River Swale. Still more staggering are the legends which affirm a submarine communication between the Giant's Causeway and Rathlin, a distance of eight miles, and between the coast of Wigtonshire and the Isle of Man, about thirty miles! These find their parallels in the legendary passage from Naples to the Castle d'Elmo, and that convenient tunnel, four miles long, which led from the mainland to the delightful island of Capri. But there is nothing new, more especially in the way of underground architecture, and we need not, accordingly, be astonished at reading that ancient Egypt boasted its subaqueous passage between Assouan and the Island of Elephantiné.—(From the "Evening Standard.")

R.I.B.A. JUNE EXAMINATIONS.

PASS LIST.

Preliminary.

Bagot, W. H. (Aldgate, South Australia).
Benjamin, A. F. (Lond., W.)
Billings, P. U. (Sale).
Birkett, S. (Manchester).
Booth, A. (Barnsley).
Bown, H. L. (Harrogate).
Bray, A. G. (Bolton).
Brook, T. H. (Holmfirth).
Bulmer, F. H. (Woolwich).
Burbage, J. H. R. (Southampton.
Burke, M. J. (Dublin).
Cartwright, H. (E. Fnchly.
Chamberlain, A. (Newcastle-on-Tyne).
Chaundler, J. H. (Eastbourne).
Cheatle, R. H. (Burford, Oxon.).
Clay, H. (Gainsborough).
Clifford-Smith, W. (Poole, Dorset).
Clissold, W. (Minchinhampton).
Cobbett, G. B. (Addlestone, Surrey).
Collins, A. F. (Windsor).
Cooper, C. S. (Gainsboro').
Crabb, H. R. (Exeter).
Culley, N. (Huddersfield).
Curwen, R. B. (Lond., N.E.).
Dahl, J. L. S. (Liverpool).
Davidson, G. V. (Paisley).
Day, V. A. G. (Old Aberdeen).
Dick, N. A. (Edinburgh).
Dicks, H. E. (Cheltenham).
Dod, E. J. (Southport).
Donnelly, R. (Holywood, co. Down).
Downs, H. B. (Guiseley, Yorks).
Duncan, A. McL. (Perth).
Durston, C. C. (Weston-super-Mare).
Eaton, C. W. (Leicester).
Edwards, S. A. (Manor Park, Essex).
Ellis, T. M. (Hull).
Fifoot, L. S. (Penarth).
Gibson, G. McL. (Hornsea).
Gill, C. L. (London, N.W.).
Gott, J. H. (Margate).
Gould, G. H. B. (Ipswich).
Gutteridge, R. F. (Southampton.
Gwynne, G. I. (Boscombe, Hants).
Hall, S. A. (London, N.).
Halliday, J. T. (Plymouth).
Hart, F. J. W., (Lond. N.W.).
Hastewell, R. E. (Haltwhistle).
Hedges, F. R. (Wisbech).
Higson, H. W. (Bolton).
Hill, S. W. (London, N.).
Hird, H. D. (Halifax).
Hodges, W. A. (Wimbledon Park).
Holland, H. D. (Pemberton, near Wigan).
Holmfeldt, A. P. (Hull).
Holt, H. G. (Bolton).
Huddart, R. M. F. (London, W.).
Hunter, R. C. (Edinburgh).
Iron, W. S. (London, N.E.).
Jackson, W. (Hitchin, Herts).
Jaques, S. (London, E.).
Jennings, D. S. (Lond., W.).
Johnson, W. H. (Great Yarmouth).
Jones, F. H. (Leicester).
Jones, P. C. (Leicester).
Joynes, W. J. (Bristol).
Kerr, T. R. (Inverness).
Keys, H. P. (London, N.).
Körner, T. W. F. (Sunderland).
Lambert, A. P. (London, S.W.).
Langham, C. S. (Leicester).
Le Gassie, A. H. (Plympton, Devon).
Linnell, H. R. (Leyton, Essex).
Lloyd, J. W. (Taunton).
Lynham, A. G. (Bristol).
Macdonald, D. (Muir of Ord, Ross-shire).
MacGeorge, A. C. (London, W.).
Macmillan, A. L. (Southport).
Mac Rae, E. J. (Edinburgh).
Marshall, F. (Stockport).
Matley, J. (Oldham).
Mitchell, D. (Lond., S.E.).
Mitchell, J. (Edinburgh).
Mitchell, W. H. (Sale, Manchester).
Morland, G. (Croydon).
Morran, H. S. (Plumstead, Kent).
Murray, G. C. (Stoke, Devonport).
Murray, R. H. (London, S.W.).
Newton, P. G. (Kingstown, co. Dublin).
Noël, J. H. (Wakefield).
O'Connell, V. J. (Dublin).
Paice, W., jun. (Egham, Surrey).
Pearson, E. W. (Idle).
Petch, E. S. (Wakefield).
Phipp, R. A. H. (Devizes).
Pinsent, C. R. (London, N.W.).
Prentice, R. R. (Lond., N.).
Pryor, E. L. (London, S.E.).
Pursglove, A. (Heaton Moor).
Rainger, H. T. (Cheltenham).
Reid, J. (Dalmarnock, Glasgow).
Rigby, A. (Manchester).
Robinson, K. D. S. (London, S.W.).
Roe, C. K. (London, W.).
Rowe, P. J. (Marlow-on-Thames).
Saunders, F. S. M. (London, N.W.).
Scrivener, A. T. (Stoke-on-Trent).
Smith, J. (Alnwick).
Smith, W. J. (Richmond).
Snow, A. L. (Chislehurst, Kent).
Stenner, W. J. (Bristol).
Street, A. W. (Birkenhead).
Sturgess, A. D. (London, N.W.).
Taylor, C. N. (Manchester).
Thomas, C. S. (Swansea).
Thomas, H. (Swansea).
Thomas, P. E. (Penarth).
Thompson, J. O. (Poppleton, near York).
Thorp, R. W. (Headingley, near Leeds).
Thunder, C. (London, S.W.).
Travers, W. I. (Lond., W.).
Vardy, C. A. S. (Maidenhead).
Vaux, N. (Sydenham).
Vincent, E. A. J. A. (Chertsey, Surrey).
Wagstaff, A. (Glasgow).
Walker, E. G. (Lond., S.E.).
Walker, F. H. (Windermere).
Walton, W. B. (Blackpool).
Webster, F. H. (Norwich).
West, J G. (Cardiff).
Wilson, E. L. (Southport).
Wood, G. A. (Bradford).
Woodcock, R. S. (Aldeburgh-on-Sea, Suffolk).
Wren, E. L. (Leicester).

Intermediate.

The following have passed the Intermediate Examination, the names being given in order of merit as placed by the Board of Examiners :—

P. B. Dannatt; J. S. Brocklesby; B. Greig; E. G. H. Gunn; A. G. Maitland (Tain, N.B.); W. Greenwood (Blackburn); J. H. Belfrage; R. T. Longden (Burslem); E. P. Archer; E. Quiggin (Liverpool); H. Ryle (Newcastle-on-Tyne); C. F. Callow (St. Leonard's-on-Sea); H. Black; T. F. Amery (Sheffield); W. E. A. Brown; J. A. Fletcher (Leicester); W. J. Delbridge; S. Bridges; H. P. Gordon; H. E. Rider; G. E. Elkington; R. Wylie (Gateshead); G. M. Page (Lincoln); H. M. Pritchard (Cardiff); J. O. Raymond (Tring); G. S. Salomons (Manchester); J. Green (Birmingham); F. G. Newton; F. J. Toop (Lincoln); W. E. Brooks; H. Drury; E. H. Walker; F. J. Lucas; R. J. Archibald (York); A. F. Warth (Birmingham); W. P. Watson (Coventry); J. A. Hossack (Banff, N.B.); A. N. Campbell; J. Boyle (Bolton); H. F. Buckley (Halifax); F. J. A. Corfield; B. Drummond (Fleetwood); E. F. M. Elms; F. J. Forster (Darlington); E. T. Goff (Lowestoft); L. A. Loades (Morpeth); H. J. Mauchip (Bristol); S. Salisbury (Harpenden); J. H. Shearer (Exeter); W. H. Watkins (Bristol).

Final.

The following have passed the Final Examination, qualifying for Associate R.I.B.A. :—

J. P. Bishop (London); W. M. Dean (Gravesend); L. G. Delmar (London); L. W. Ensor (Huddersfield); C. H. Gage (London); L. C. Gregory (London); J. P. Hall (London); S. J. Halse (London); A. G. R. Mackenzie (Aberdeen); C. Stretton (Leicester); E. J. Pullar (London); R. C. Wrinch (Ipswich); F. D. Clapham (London); W. B. Dawson (London); E. G. Page (London); C. E. Power (London); T. W. Aldwinckle (London); C. H. E. Bridgen (London); D. J. Brundrit (Cheshire); H. Cayley (Cambridge); H. D. Day (Godalming); T. N. Dinwiddy (Greenwich); K. Gammell (London); G. R. C. Harding (London); C. L. Hall (Lancs.); A. Holstead (Alnwick); E. V. King (S. Shields); A. Pickup (Blackburn); L. E. Pryke (Surbiton); A. H. Roe (London); R. B. Rowell (London); J. G. Walker (Wakefield).

A NEW MEMORIAL HALL AT LAURENCEKIRK.

The new Dickson Memorial Hall, Laurencekirk, was opened recently. The hall has been given by Mr. Patrick Dickson, of Barnhall, and his sisters, Misses Dickson, Frogfield, Laurencekirk, and Mrs. Morrison, Aberdeen, to the Kirk-session of Laurencekirk parish church as trustees for the congregation. The building, the total cost of which will be about £2,500, consists of a main hall, with subsidiary classroom and retiring-rooms. In character the edifice is ecclesiastical, and the style is Late Gothic. The hall, which will accommodate an audience of about 300 persons, is 63ft. in length by 25ft. in width inside, with side walls 12½ft. high from the floor to the eaves, and is covered by a very strongly framed open timber roof, the apex of which is about 33ft. above the floor level. The principals are of the hammer-beam type, with arched ribs and brackets, forming a trefoil-shaped opening under each principal. The common rafters and boarding are carried upon massive purlins resting on the principals, the whole construction and covering being visible from the hall. The ends of the hammer beams are decorated with carving, angel heads with wings alternating with the gridiron and palm branches of St. Lawrence. At the north end of the hall is placed a permanent platform, raised about 2ft. above the floor. At the south end is a small gallery, over the vestibule, which is separated from the hall by a screen, glazed with clear glass in ornamental lead quarries. The hall is lighted by five two-light windows with traceried heads on the west side; by a two-light and a single-light of similar character on the east side; by a large three-light mullioned and elaborately traceried wheel window in the south wall behind the gallery. A feature of the interior is the stone arcade between the hall and the classroom, measuring 24ft. by 15ft., giving the classroom something of the effect of an aisle. The classroom may be divided into two portions, and it may also be shut off from the hall by heavy woollen curtains. The whole of the stone used in the building is freestone from Lauriston; and all the dressings to the doors, windows, piers, arches, &c., inside and outside the building, are moulded and finely scabbled; the walling outside is of broken jointed, squared, snecked Ashlar, with the quarry face on the exposed surface. The hall outside is distinguished by its steep gables, its massive buttresses at all corners, its traceried windows, and by a tall porch, which almost connects the vestibule with the footpath of the Station Road. Some character has been given to the porch by its spreading buttresses, its tall traceried lancets, and especially by the treatment of the doorway, over which there is a pointed arch as well as a lintel at the springing. The lintel has been richly decorated with carving, and the stone tympanum is also richly diapered and carved. In the gable of the porch is a flush panel, lozenge shaped, bearing the date 1900. A conspicuous feature of the building is the timber flèche, every portion of which is covered with lead. The flèche rises to a height of 18ft. above the ridge of the roof, and the top of the copper weather vane to about 4½ft. farther. The roofs are covered with slate of a particularly pleasant greenish-grey colour from Preselly. The glazing throughout the hall and classroom is entirely of leaded quarries, mostly of white glass, clear or slightly obscured, and enriched by bits of strong colour of fine quality in the heads of the windows. The hall has been furnished with an oak reading-desk, table and chairs, and also with stained and varnished pitch-pine benches.

The masonwork was done by Mr. Alexander Watt, builder, Laurencekirk. The other departments of the work were carried out by the following tradesmen :—Carpenter work, Messrs. Hendry & Keith, Aberdeen; plumber work, Mr. Robertson, Aberdeen; plaster and concrete work, Mr. Sellar, Aberdeen; slater work, Mr. Davidson, Aberdeen; heating apparatus, Messrs. McKenzie & Moncur, Edinburgh. The furnishings were supplied by Messrs. James Garvie & Sons, Aberdeen, who also did the glazing work. The architect was Mr. William Kelly, of Aberdeen.

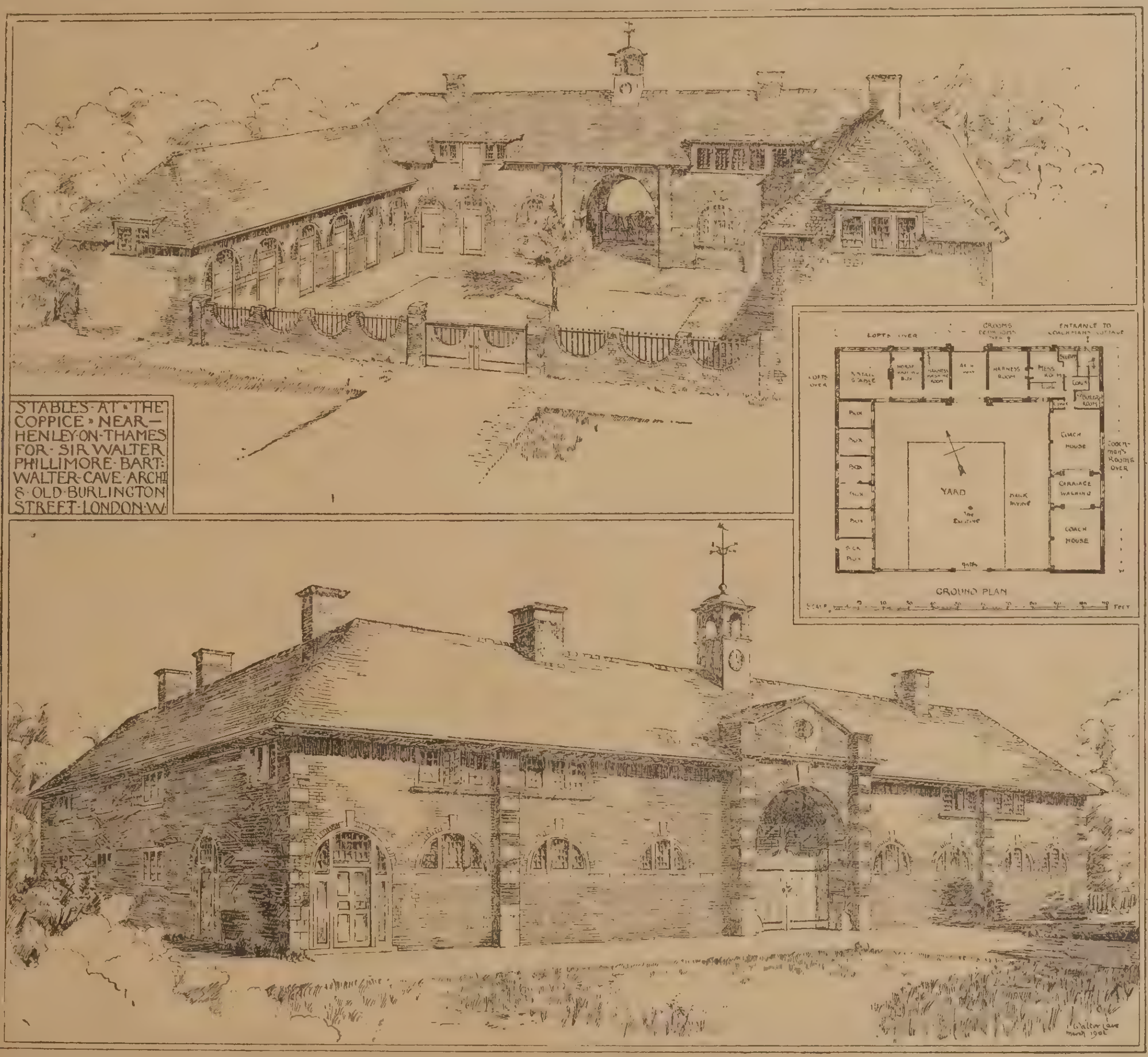
A NEW RAILWAY HOSPITAL AT CREWE.

In connection with an immense concern like the great works of the London and North Western Railway Company at Crewe—the largest works of their kind in the world—it is practically an impossibility to guard against accidents of a more or less serious character frequently occurring. In spite of all the precautions and the various means adopted by the railway company for the protection of their servants, accidents must of necessity occur from time to time, and, unfortunately, it sometimes happen that they are attended with results of a shocking character. It is in such cases as these that the benefit of efficient and skilled hospital treatment is appreciated, and the directors of the company have now provided proper hospital accommodation, with an able surgical staff, for cases of accident. The new building is in Mill Street, and has just been completed. It has been erected at a cost of between £7,800 and £8,000. It is lighted throughout with electricity, and the entire work has been carried out by the railway company themselves under the personal direction of Mr. F. Webb, the superintendent of the works. Its situation is so central that it is within easy access of the works, and also the steam sheds and railway station, and it is also near either the Manchester, Liverpool or Chester lines. There are two wards, each containing eight beds. At the side of each bed there is an electric-light switch, and also a small cupboard for the use of the patients. The wards open out on to a large verandah by means of French windows, and beyond the verandah is a garden. There is a commodious entrance hall, leading to the wards, and to the centre there is a novel table, the top of which consists of a portion of the trunk of a huge English elm tree. It has been cut according to the exact shape of the tree, and then polished. The operating-room is in close proximity to the wards, and is fitted up with porcelain and glass, the floor being paved with wood blocks, and covered with a casing of lead so as to guard against any possibility of damp. All the corners of the room and also the cornices are rounded, with a view of preventing the lodging of dust. The room is well lighted, and is equipped with all kinds of surgical appliances. Adjoining the operating-room there is a bathroom, with a movable bath, and to the left of one of the wards there is a room that is specially set apart for the use of the nurses. A long corridor leads to the patients' sitting-room, the kitchens, scullery, pantries, &c., and at the end of the corridor there is an isolation ward containing two beds. The mortuary is in the hospital yard, and is divided from the main block of buildings by double gates, which provide an entrance to the hospital from the work. On the side nearest to the street a surgeon's house has been erected, and this is to be occupied by Dr. and Mrs. Lawrence. Its style of architecture is in keeping with that of the hospital. It contains a study, drawing-room, dining-room, sitting-room, kitchen, pantries, scullery and all other necessary conveniences. The whole of the premises are heated with Langford's hot air apparatus, and Tobin's tubes provide the means of ventilation. It may be interesting to state that in the department over which Mr. Webb presides there are now some 18,000 men employed, about 12,000 of whom are engaged either in Crewe Works or in other parts of the local department at Crewe. There is in addition a large staff connected with the traffic department, and several hundred men are also employed in the permanent way department.

Law Cases.

Reversible Casement Windows: Interesting Patent Action.—Judgment was recently delivered at the Essex Assize Court, Chelmsford, in the case of *Clare and others* v. *The Crittall Manufacturing Co., Ltd.* This was an action to recover £50 due and damages for breach of contract under an agreement made with the defendant company in October, 1898. In opening the case for the plaintiffs counsel said they were the inventors of a patent reversible casement hinge which was developed in October, 1893. It consisted of a stiff vertical bar with horizontal arm top and bottom, joined together so as to become one rigid [-shaped appliance to be hinged at the side to the frame and at the end of the arms to the top and bottom rail of the casement, in order that the casement might be opened in the usual way on the side hinges and by releasing a catch reversed on the horizontal arm hinges. The object of the device was to enable the outside of the glass to be cleaned from the inside. A model of the invention was taken to the Crittall Manufacturing Co. in October, 1898, and after some negotiations a provisional agreement was drawn up by which the defendant company obtained the sole right to manufacture the device under certain royalties. The plaintiffs received £50 down from the defendants, who agreed to pay another £50 when the final specification was produced, together with an expert's opinion as to validity. Upon searching the patent records the plaintiffs found that other devices had been previously patented by a German named Rump and another by an Austrian named Osternberg. The latter failed to complete his English patent, and it therefore became public property in this country. Though resembling the plaintiffs' device, neither of these two inventions possessed the strong vertical bar connecting the two arms. In January, 1899, the defendants suggested that the matter should be concluded. In the following July plaintiffs obtained the final specification and produced a report by Mr. Bousfield, K.C., stating that in his opinion Clare's patent was not an infringement of any similar patent. In June, 1899, the defendants advertised the casement widely, calling it the "Crittall Safety Casement," and up to the present time had been manufacturing and selling it extensively, some marked Rump's patent and some not marked at all. Counsel produced various models of the different inventions and called evidence to show the difference between plaintiffs' device and those of Rump and Osterberg. The jury at this juncture expressed the opinion that no further evidence was needed on that point. Mr. J. A. King, agent for the "Mack" slab, of Queen Victoria Street, London, was then called to prove that he and a friend had seen the Crittall Manufacturing Co.'s stand at the Building Trades' Exhibition this year, and their representative told them that they had tried to make the casements satisfactorily without the vertical connecting bar, but found that this was absolutely indispensable. Counsel for the defendants submitted that the plaintiffs had no case and that the validity of the plaintiffs' patent was not proved. Mr. F. H. Crittall, managing director for the defendant company, said he went to Hamburg in May, 1899, and entered into an agreement with Rump to acquire the sole right to manufacture his patent, and since then he had manufactured under that agreement, although it was admitted that casements had been fitted that were not marked Rump's patent, which he regretted. Mr. Brunton, manager for Messrs. Crompton & Co., Chelmsford, stated that superficially the casement made by the defendant company was like the plaintiffs' patent, but in principle it was Rump's. The jury decided that plaintiffs' patent was the best they had seen, that it was a valid one and that defendants had been working under plaintiffs' patent. The judge gave judgment for the plaintiffs for £50 with costs and ordered an account to be furnished to plaintiffs. Stay of execution for ten days was granted.

An Impossible Patent.—The case of *Case* v. *Cressy* came before the Court of Appeal last week. This was an appeal against the decision of Mr. Justice Buckley that the plaintiff's patents (No. 14,115, of 1896) is invalid for want of proper subject matter. The patent is for the "improved construction or arrangement of shore groynes." In the final specification the nature of the invention was thus described: "This invention has for its object constructing shore groynes from a combination of upright or angle-wise-arranged timbers in couples, with lower ends set in concrete beds, preferably from about mean sea level to low-water mark, and landwards from the same point to the shore or sea-wall, the spaces between the upright or angle timbers having horizontal planks let in or slipped down to form intermediate screens." The specification added that metal uprights and plates, or a combination of metal and wood, might be employed. The plaintiff claimed "the construction of shore groynes in the manner described by preparing braced uprights, inserting them in holes, fitting them by cement-concrete, and finally screening the intermediate spaces by horizontal planks or their equivalents, as set forth, the structure taking the form shown in the annexed drawings." Mr. Justice Buckley was of opinion that the plaintiff had not invented anything, though he had made a discovery, but it was not proper subject matter for a patent. The plaintiff appealed. It was stated that his method of constructing groynes has, among other merits, those of cheapness and rapidity of construction. The court dismissed the appeal. Lord Justice Rigby said that, though he felt sorry that he could not adopt the view put forward on behalf of the plaintiff, he



STABLES · AT · THE
COPPICE · NEAR —
HENLEY-ON-THAMES
FOR · SIR WALTER
PHILLIMORE · BART:
WALTER · CAVE · ARCHT
8 · OLD · BURLINGTON
STREET · LONDON · W

thought the learned judge was quite right in holding that the plaintiff's method of construction was not a novelty, though the application of it might be a novelty. Lord Justice Collins was of the same opinion. It seemed to him that what the patentee had done was merely to use upon the seashore a fence which was well known and had been already used upon land. Lord Justice Romer agreed.

Ancient Lights.—In the Chancery Division of the High Court of Justice on June 25th Mr. Justice Cozens Hardy had before him the action of *Welborn* v. *Harrogate Central Arcade Co.*, by which the plaintiff asked for an injunction to restrain the defendants from erecting on their premises on the west side of Back Beulah Street, Harrogate, any building which would darken, injure or obstruct any of the ancient lights or windows of the plaintiff's premises. The plaintiff had received an offer from the defendants not to build higher than 14ft. 6in., and under those circumstances the question resolved itself into one of costs. Mr. Justice Cozens-Hardy granted an injunction in the terms of the letter referred to, and gave the plaintiff costs of the action, except those of bringing up the witnesses from Harrogate.

GLASGOW ROYAL INFIRMARY.

ARCHITECTS' REPEATED PROTEST.

THE following is a copy of a letter sent to the Executive Committee by the Glasgow Institute of Architects:—

Gentlemen,

I duly received your letter of 18th ult., which has already been acknowledged, and I am instructed to state that the Glasgow Institute of Architects regrets that no more explicit reply has been vouchsafed to its protest and appeal, by the Managers and the Executive, than what is contained in the official statement issued to the public (see p. 321 of the issue of the Builders' Journal for May 29th last). Nothing in that statement in any way answers or refutes the objections previously raised by the Institute. The statement, indeed, rather confirms them; and the Institute therefore remains of the opinion that the plans as adopted "are in many vital particulars inadequate and out of date": that their distribution on the site, particularly with regard to the "Jubilee Block," facing Cathedral Square, is bad, and that in consequence, if the reconstruction is proceeded with according to those plans, "the infirmary will not conform to the most modern standards of design in this class of building."

The criticisms of the Institute on the previous occasion were chiefly concerned with (1) the manner in which the competition was conducted, according to which solutions of the problem other than those put forward by the managers did not receive unbiased and adequate consideration; and (2) the insistence on the Jubilee Block as an integral part of the scheme. Such a block the Institute considered to be objectionable, because (*a*) it would shut out from the rest of the buildings the sun and air from the southern and most open part of the surrounding area, and (*b*) it would dwarf and irretrievably injure the external appearance of the cathedral.

With regard to the first of these two points, while the managers in their letter refer to the block plans which they have prepared with much time and labour as being "suggestive and illustrative only," and this is repeated in the statement and appeal of the Executive, one learns also from this latter that "when the final selection was made the Executive Committee fixed on a plan which the assessor reported as being one of two which most closely conformed to the sketch plans." *i.e.*, those drawn up by the managers. As further reason for the adoption of this particular plan the Executive give a list of special characteristics in respect to internal arrangements which they consider to be essential or desirable features, yet these were all contained in other designs submitted, which were at the same time free from the radical defects referred to.

As to the Jubilee Block, the managers now state, as their sixth conclusion, "That the new hospital, and not a section of it, should be regarded as alone worthy of the City of Glasgow, and as a fitting memorial to the sixty-three years' illustrious reign of the Queen." This is exactly the position adopted by several of the competitors and by the Institute, while objecting, from practical reasons already stated, to its inclusion as part of the scheme. With reference to the cathedral, it is therefore quite beside the point for the Executive to state that "the buildings must be lofty if the hospital requirements of the public are to be adequately met," for, while the buildings must be lofty, on other portions of the site (if that site is to be retained) there is no necessity for their being lofty in the direct alignment with the cathedral, nor, indeed, for there being any buildings at this point at all, as was shown in one or more of the plans submitted. The Institute does not admit that the injury to the cathedral is a question of architectural style; it is one of comparative height and scale. As regards these, the plan adopted is especially objectionable in that not only is the block itself seven storeys high, but it has in addition a lofty spire which would further and quite unnecessarily assist to dominate and destroy the effect of the cathedral.

The Institute of Architects feel it to be their duty in the interests of the public (for whom they speak as a body of technical experts in such matters) to thus repeat and emphasise their protest, and to again most earnestly urge the Executive, before committing themselves and the public to the erection of any portion of the building, as designed, to have the plans submitted to one or more independent hospital authorities of recognised and outstanding position for consideration and report. Further, should the Executive object to the outlay involved in such a course, the Institute would be prepared to arrange for it and to meet the cost provided the report did not bear out their contention, while submitting beforehand the name or names of the experts proposed, on obtaining the necessary facilities from the Executive.

(Signed) C. J. MacLean, Secretary.

A NEW CHURCH AT MUSWELL HILL, N.

THE foundation stone-laying of the L.B.A. Church, Muswell Hill, N., took place on Wednesday last. The design was selected in a limited competition held recently. The main gable is flanked on the right by a bold tower terminated by a spirelet and weather-vane, and on the left by a dwarf tower, both of which contain fire-proof staircases to the gallery. A bold projecting Narthex, containing the main entrance to the ground floor, forms a feature in front. A notable point in the plan is that the whole of the seating is arranged in a semicircular form, so that the entire congregation directly faces the preacher. The ceiling is vaulted in woodwork with a central crossing between four wide arches supported on columns. This vaulting is surmounted by an octagonal dome which conducts the foul air into an air-shaft, and is thence expelled into the open air through a patent air-pump ventilating flèche on the roof. The baptistery is to be kept open, and is lined with marble, having a bold moulded oak handrail in front supported by wrought-iron and copper standards on a marble curb. Ladies' and gentlemen's choir and baptizing vestries are placed immediately behind the pulpit and have direct access from the baptistery under the pulpit; this arrangement preventing the necessity of candidates passing before the congregation after immersion. Deacons' and pastor's vestries are also provided. A large schoolroom, with all necessary classrooms, ladies' working - room, superintendent's room, infants' room, kitchen and heating chamber, &c., is provided under the church; the level of the land making this desirable. The materials to be used are red brick facings with Bath and Costessey stone dressings. The roof is to be slated. A special system of ventilation is adopted, the form of ceiling lending itself to a very good treatment. The adult seating accommodation, reckoning 20in. for each sitting, is about 472 on the ground floor, 30 in the choir and 268 in the gallery. This gives a mixed congregation of about 900 persons. The architects are Messrs. George Baines, F.R.I.B.A., and Reginald Palmer Baines, of 5, Clement's Inn, Strand, London, W.C. The contract is let to Messrs. Mattock Brothers, of 219, Isledon Road, N., for £6,408 16s. The architect's estimate was £6,780.

New Patents.

These patents are open to opposition until August 12th.

1900.—**Brickmaking Machines.**—12.132. J. G. Lowood, Five Oaks, Sheffield; W. J. Gardner, 8, West Hill, Huddersfield; and J. W. Armstrong, 20, Meersbrook Road, Sheffield. This invention relates more particularly to "silica" bricks. It consists of a double-action brickmaking machine having automatic devices for filling the moulds with clay; dusting the upper surface; pressing and delivering the brick; and returning to its original position.

Fixing Glass in Windows.—13,371. A. G. Spencer, 77, Cannon Street, London. The pane of glass is held in the rebate of the sash by strips of wood or other suitable material, a strip of india-rubber being interposed to render the joint water-tight.

Brickmaking Machines.—13,919. T. C. Fawcett, Ltd., Whitehouse Engineering Works, Hunslet Road, Leeds; and J. W. Bottomley, of the same place. Means are provided to prevent the sides of bricks moulded in cylinder moulds being forced up in the die box and so spoiling the brick. Another part of the invention, relating to screw brick and tile presses only, provides means (in conjunction with a friction drive) for automatically stopping the machine each time the pressing rammer is withdrawn from the die box.

Firegrates.—16,643. G. R. Keel, 67, Beaconsfield Street, Newcastle-on-Tyne. It sometimes happens that the front of a fire is dull while the back portion is bright and glowing. According to this invention the grate proper is circular and may be rotated so as to bring any part to the front.

Builders' Cradles.—17,995. J. Coppard, 207, Pentonville Road, London. The cradle is hung by ropes and is provided with a cog-wheel and drum for raising and lowering purposes.

1901.—**Centre-Bit Drills for Iron.**—1,549. A. W. Watson, 8, Russell Road, Lea Bridge Road, Leyton. This bit may be used in an ordinary brace, and is for drilling iron—such as iron tanks. It resembles the drill for wood except that the centre portion is shaped at the point similar to an ordinary iron drill.

The following specifications were published on Saturday last, and are open to opposition until August 19th. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1900.—12,386, Millane, roller-blind fittings. 13,274, Whitaker, excavating apparatus and cranes. 14,028, Cottier, sliding windows. 14,097, Shanks, urinals. 14,098, Shanks, ships' water-closets. 14,179, Mechan, cowls. 14,219, Beer, glass tiles. 14,318, Murgatroyd & David, water-waste preventing cocks. 14,520, Doulton, flushing arrangements for latrines. 14,773, Meyer, pumps. 14,785, Mackintosh, apparatus for enlarging designs. 15,728, Tonks, Ltd., & Hollins, roller-blind furniture. 15,940, Schwarz, manufacture of limestone. 18,339, Christie, coverings for walls and ceilings. 21,580, Morrison, tap or valve. 23,428, Ward, & International Oil Furnace Co., Ltd., portable furnace for application to single or double flued boilers, kilns for bricks, &c.

1901.—281, Budd, construction of sheet metal spoke blanks for pulleys. 367, Lundberg & Lundberg, multiple wall connections for electric lighting, heating, &c. 439, Jirotka & Roth, acetylene lamps. 1,220, Mackintosh, manufacture of repeat patterns for textile fabrics, wallpapers, &c. 1,288, Beresford, valves for water-closets. 2.861, Barreto, apparatus for slaking lime. 6,773, Hughes, holder for paint brushes or liners. 7,188, Beck, acetylene gas generators. 7,240, Hennebique, construction of quay walls, retaining walls, &c. 8,275, Boult (*Soc. Lumière Boule*), incandescent or bunsen gas burners. 8,278, Boult (*Dugins*), roller for blinds and mode of operating them. 8,281, Boult (*Soc. Lumière Boule*), mantle supports for incandescent gas burners. 8,547, Vollmann, apparatus for cooling and purifying air. 9,739, Beny & Heinrigs, apparatus for slaking lime. 9,956, Brookes (*New Haven Novelty Machine Co.*), couplings for lead pipes, &c. 9,989, Chesterman, engineers' squares. 10,018, Speidel, manufacture of profiled articles of ornament.

A REMNANT OF OLD BRISTOL.

A BRISTOL newspaper has been supplied with some interesting particulars relating to four ancient houses between Messrs. Robinson's new factory and St. Thomas's Church. The earliest record of these houses (which have lately been renovated) dates from 1566. They then belonged to St. Thomas Church, and how long before that period they so belonged is not known; but they were probably built on land belonging to the church when it was founded in the twelfth century. The premises consisted at the above date of three tenements with their appurtenances, one of which was called the Church House. The next mention that can be traced relates to 1636, when the premises seem to have been converted into one messuage in the occupation of Thomas Bright, butcher, with a wool hall or loft adjoining, together with shops, slaughter-houses and chambers. In 1659 they appear to have been in somewhat the same condition, but between that date and 1689 they were converted into four dwelling-houses, and to that period may be ascribed the present buildings, as they are similarly described, without mention of any alteration in 1717, 1746, 1761 and 1789, and were still in that condition in 1822, when an investigation of the Bristol Charities was made by a Government Commissioner, and they have not since been structurally altered except by the addition of a shop front a few years ago.

The backs of the premises are immediately adjoining the churchyard, and against the opposite wall of the churchyard, within the memory of the present clerk of the church, the old stocks of the parish were fixed. These stocks were for many years kept within the precincts of the church premises, but cannot now be found, much to the regret of the present wardens, who would like to have retained them amongst other ancient remnants of the church fittings, &c. Previous to its removal to Temple Meads about sixty years ago the cattle market was held every Thursday in Thomas Street, and against the houses in question and others and the church were the pens for sheep and pigs attached to the walls and pavement by iron rings, and leaving passages only to the doorways. It was only a few years ago that the iron rings in the church wall were removed. A view of the pens and animals against the church wall is still retained as an ornament on the forms on which the vestry notices are issued.

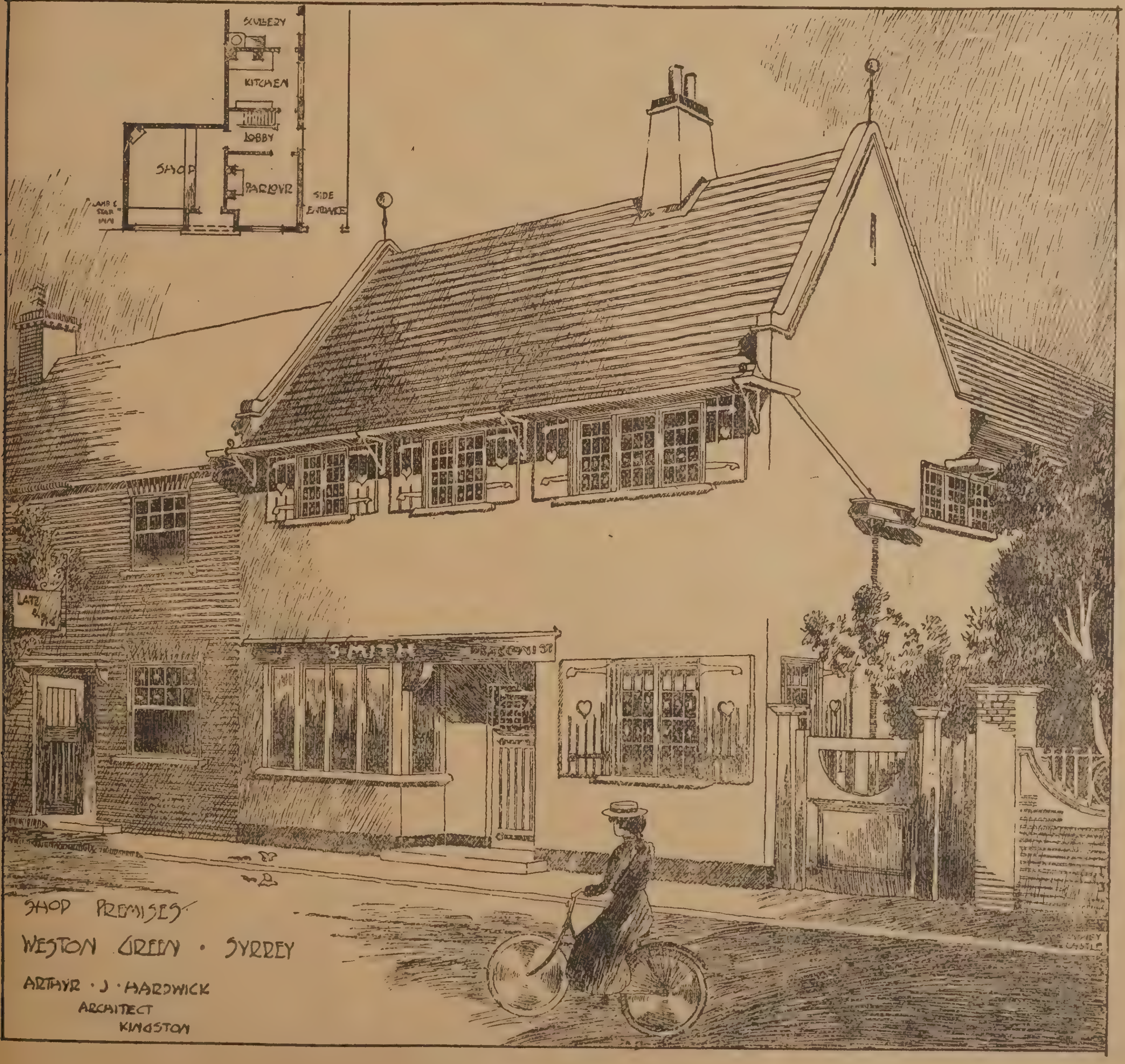
Cottage Shop at Weston Green, Surrey.—This shop, for Colonel Walter Campbell, is now in course of erection. It is to be carried out in white rough-cast with green slates. The plinth is formed of cement tarred; the woodwork to shop is in oak. The outside paintwork generally will be a dull green, and the window will be glazed with lead glazing. Mr. A. J. Hardwick, of Kingston-on-Thames, is the architect, and Mr. T. Adkin, of Surbiton, the contractor for the works.

QUEEN VICTORIA MEMORIAL.

The Committee Inspect the Designs.

THE Queen Victoria Memorial Committee met on Thursday last at St. James's Palace, and not only inspected the designs by the five selected competitors, but took into consideration various suggestions made by outside persons. They seem to have adopted the proposal that models of the designs should be submitted as well as drawings, a plan which was followed in the case of the monument in Edinburgh to Sir Walter Scott with excellent results, a Gothic design, which, although not such a grandiloquent one as the Albert Memorial, is far superior to it.

After examining the designs and models at St. James's Palace the committee adjourned to His Majesty's Office of Works, at Storey's-gate, and sat there until a late hour. Considerable time must elapse before the committee come to any decision, and their recommendations will, of course, be submitted for the approval of the King. His Majesty will, indeed, have the final decision in the matter, although no doubt his opinion will be influenced to an extent by the views of Viscount Esher, Lord Windsor, Sir Edward Poynter, Mr. Sydney Colvin, and the other gentlemen who constitute the committee. In the absence of Sir Arthur Bigge, who is on tour with the Duke and Duchess of Cornwall, Viscount Esher is acting as secretary to the committee.



Bricks and Mortar.

Aphorism for the Week.

But this pinnacle and flamework which has set your little heart on fire is all vanity; and you will see what it will come to, and that soon; and none will grieve for it more than I. And then everyone will disbelieve your pretty symbols and types.—Ruskin.

Our Plates. In the pair of semi-detached houses to be erected for Miss Charlotte E. Waters at Southborough, Tunbridge Wells, from designs by Mr. Sidney V. North, A.R.I.B.A., the cornice, columns and entablature are of wood to be painted white, with rough-cast from the first-floor level and red brick below. Wooden bays, iron casements and leaded lights will be used, and the roofs covered with Broseley tiles.—The line drawing by Mr. C. E. Mallows illustrates a partial reconstruction that Mr. W. D. Caröe carried out three years ago of the Whewells Courts at Trinity College, Cambridge.—The drawing of the workshops for the Birmingham Guild of Handicraft, by Mr. Arthur S. Dixon, was in the last Arts and Crafts Exhibition.—The residence at Windermere is built of local stone, rough-casted and lime whitened, covered with green slates from the neighbouring quarries. Messrs. Thomas H. Mawson and Dan Gibson, of Windermere, are the architects.

Capetown Cathedral. We have received from Major G. E. W. Malet, the organising secretary of the Capetown Cathedral Memorial Fund, whose address is Church House, Westminster, some particulars of the proposals with regard to this building. It is proposed to erect in Capetown a building which shall serve both as a memorial to those who have fallen in the South African War and as a thank-offering for those whose lives have been spared. In pursuance of the precedent of the erection of the English church at Constantinople after the Crimean war, it has been decided that the present memorial shall take the form of the eastern portion of the cathedral about to be erected in Capetown from plans by Messrs. H. Baker & Masey, architects. It will be seen that it is not proposed to add to the old cathedral at Capetown as was stated on p. 411 of our issue for last week. For this memorial portion of the new cathedral, which will be Gothic in style, a sum of at least £30,000 is required. Opportunity will be given to preserve on the walls of the building the names, as far as may be possible, of all those who have fallen. Towards the adjacent portion of the new cathedral a sum of about £20,000 has already been subscribed, mainly from Colonial sources.

Want of Taste in Exeter. A correspondent of the "Morning Post" who has been devoting a holiday to cathedral cities declares that Exeter has turned him into a dynamiter at heart, if not in practice. "It would be rude to speak of Deans and Chapters of the past as blockheads, but they are certainly wonderful blockers. They have had the charge of one of the great architectural masterpieces which reflects our national history. They have shut out the view of its magnificent east end with a hideous house for a canon. Dynamite! Its west end sent Freeman into raptures. But it cannot be seen for a quite superfluous church, which really need not have been rebuilt, just opposite. Dynamite! Inside, the blockers have been equally active. The unbroken line of roof is longer than that of any other cathedral in the country; the east window and the lady chapel are of exceptional beauty. But perched on the top of the chancel screen and filling up almost the entire arch is an organ of a particularly clumsy shape which effectually cuts the buildings into two halves and destroys its grandeur. It is a fine instrument, but obstructively out of place anywhere but on the floor of the transept. Finally, the glass which fills the exquisite tracery of the west window is too atrocious for words. It is of third-rate material; it belongs to the worst period; it is for the most part of a staring yellow, which has partly faded but is still flaunting. And so my first impression of the shrine of Bishop Quivil was that every attempt had been made to spoil the best points of view inside and out, while my last reminiscence is of a gaudy blaze of ugly colour."

A Swiss Convent. Architectural tourists in Switzerland this summer may find pleasure in visiting the Normal School of the Canton Aargau, at Muri, a little village on the Limmat, near the town of Baden, in Aargau. This school is established in a Cistercian convent dating from the thirteenth century, which is practically intact, only such changes having been made in it as were necessary to adapt it to the uses of the school. The convent has its legend, which is to the effect that the knight Heinrich von Rapperswyl during a pilgrimage to the Holy Sepulchre was in great danger from a storm, and vowed to establish a convent in honour of the Virgin Mary if he should be spared to reach home in safety. At that moment a star appeared through the clouds to signify that his prayer had been heard, and the storm soon abated. Returning home, he looked about for a suitable place for his convent, and while wandering in the wilderness the same star appearing in the sky, showed him that he had reached an acceptable site. He went to work with great energy, and in 1227 the convent was dedicated. In 1232, a year after the death of his wife, the good knight himself took the vows in his convent, and died there some years later. The Convent of Muri offers a very complete example of a well-organised monastic establishment, certain portions dating from the early Renaissance being very richly adorned with splendid woodcarving of the period.

CHOIR BENCH END, MIDDLETON CHENEY CHURCH, NORTHANTS.

The Tottenham Excavations. By the invitation of Mr. C. W. Sharrock, the manager of the works, a large party of the Essex Field Club recently visited the excavations for the East London Water Company's new reservoirs at Tottenham and Walthamstow. When completed these reservoirs will double the storage capacity of the company, raising it to 2,400,000,000 gallons. By these works the Lea will be diverted from its old channel into a new course which has been formed. The party inspected the so-called Viking ship, which had been uncovered in what had been a backwater in the river channel at some period. The archæologists of the party, however, were by no means satisfied that the ship had a rightful claim to anything like so high an antiquity, and it was considered that from 200 to 400 years was the greatest age that could be allowed. The discovery of fragments of coarse ware, certainly not earlier than the sixteenth century, in the same bed as the ship, and not far from it, supports this opinion. Another trip took the party to the offices, where in a shed near they saw the dug-out boat, about which there can be no doubt that it is early British. It was found on a bed of fine sandy silt, mixed with fresh-water shells, apparently the bank of an old river. Within a hundred yards from it, and practically in the same bed, the workmen discovered several pieces of Roman pottery and a well-made iron spear-head. From the constant shifting of the river-bed, due to floods, it would, however, be unsafe to lay much stress on this fact. It was hoped to secure this interesting relic for the Club Museum at Chingford, but the British Museum has established a prior claim.

The View from Richmond Hill. Mr. Henry Clarke, writing to the "Times" with reference to the statement that the City Corporation some generations ago had intervened for the purpose of preserving Richmond Park, and the suggestion that the London County Council and the Corporation should take steps to preserve the view from Richmond Hill, gives particulars of this action. "In the reign of Edward I. in the thirteenth century there existed a royal palace at Richmond which occupied about 10½ acres of ground. The only portion remaining of it is the gateway of the Wardrobe Court. The palace was surrounded by 350 acres of garden and park land, a portion of which now forms part of Kew Gardens and another portion forms the Old Deer Park. Charles I. extended the park in 1637 to the magnificent dimensions of over 2,000 acres; in fact, Richmond Park to-day is about the size of Regent's, Hyde, St. James's, the Green, Victoria, Southwark, Battersea, Greenwich, Finsbury and West Ham Parks altogether, with Kensington Gardens thrown in. In the Cromwellian period the Commonwealth probably hesitated about selling the additions made by the late king, and the Corporation was found willing to undertake the charge of the park, and by a resolution of the House of Commons in 1649 it was given to the City for ever. The Corporation, with its customary enterprise, managed this beautiful place of recreation until the Restoration in 1660, when the citizens, having probably learnt that his Majesty Charles II. wished it, restored it; the king graciously accepting it not as restored but as freely given unto him by the City."

After Four Thousand Years. The results of the last season's work obtained by Professor Petrie, at Abydos, and Mr. Randall-Macivor, at El Amrah, for the Egypt Exploration Fund, and by Mr. J. Garstang, at Beit Khallaf, for the Egyptian Research account, are, like those of previous years, now being exhibited at University College, Gower Street, and will remain on view till July 27th. The most interesting broad deduction from the objects brought together in this exhibition is the existence of a high standard of artistic excellence in Southern Europe as early as the first dynasty. The conclusion to be arrived at seems to be that Hellenic and Egyptian civilisation were separate from and independent of each other, but with points of contact. Last season, as in the one before, specimens of early Ægean pottery were discovered. The forms are of great beauty, not unworthy of the best days of Hellenic workmanship. Of the earlier work, the specimens of the casts, part is assigned to the prehistoric age and part to the first and third dynasties. "The prehistoric results," we are informed, "have been obtained from two cemeteries—one belonging to the first half of the prehistoric age, the other extending from the earliest time down to the first dynasty, and covering, therefore, the interval between the prehistoric series and the historic, which has not yet been well defined." These include slate palettes, worked flints, maceheads, whorls, marbles, pieces of ivory, domestic pottery, &c. Some pottery cylinder jars came from the tomb of King Ka—the earliest yet known; and with pieces of large pottery jars, all having his name incised on them while wet. An interesting but somewhat obscure object is a gold bar of King Mena—circ. 4777—with his name Aha engraved on it. This bar weighs 216 grains, the amount of the earliest standard for weighing gold. But its use has not been ascertained or conjectured. The Queen of Zer's bracelets—Zer was the second king of the first dynasty—were the most important finds of gold work, of which the originals are in the Cairo Museum. Four bracelets were found in the *débris* left by the builders of the Osiris shrine, by the Coptic destroyers and the Arabs employed by the French mission. The exhibition must arouse infinite delight in the specialist and speculative wonder in the ordinary educated visitor.

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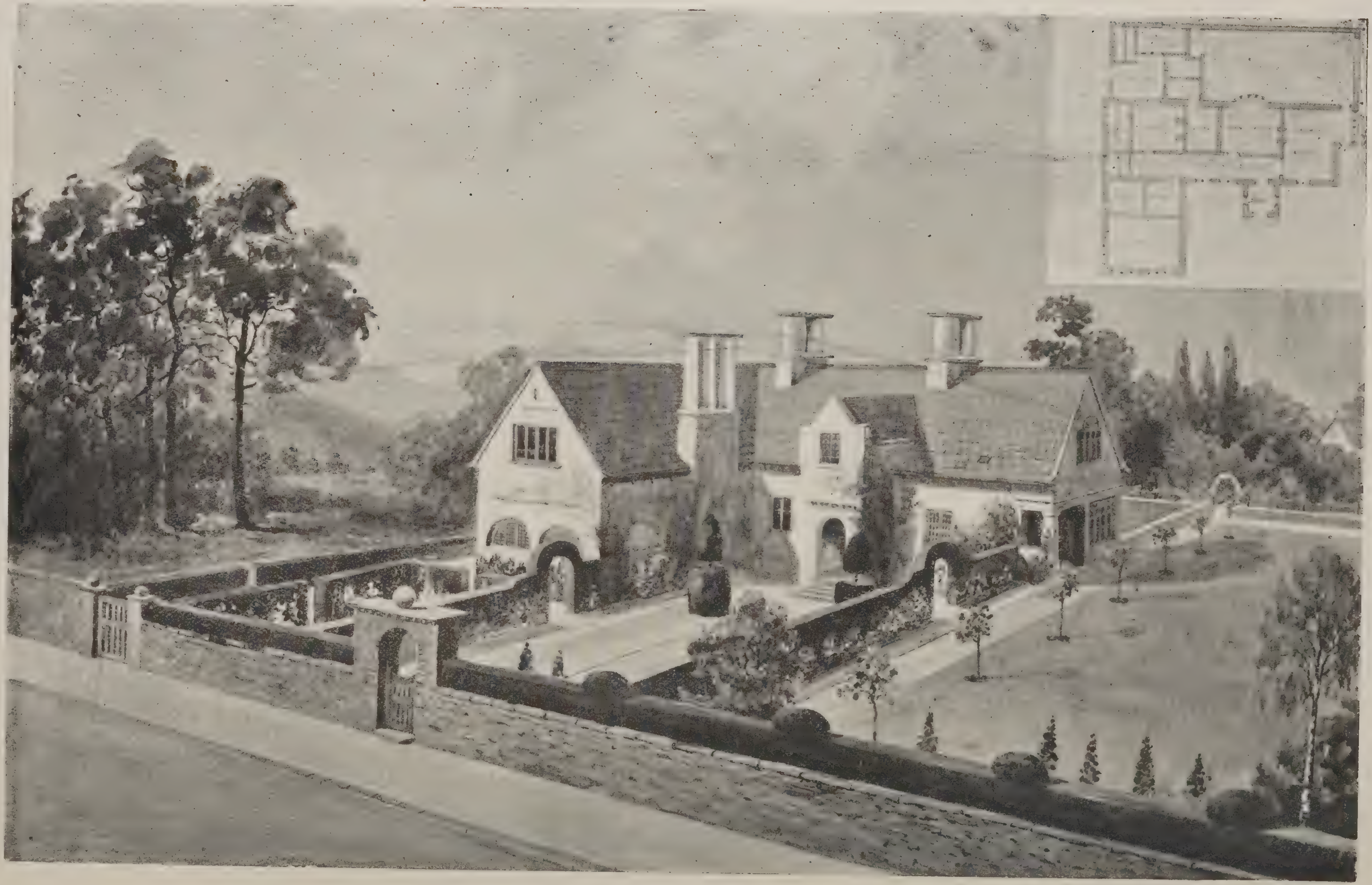

HOUSE AT WINDERMERE. THOMAS H. MAWSON and DAN GIBSON, Architects.

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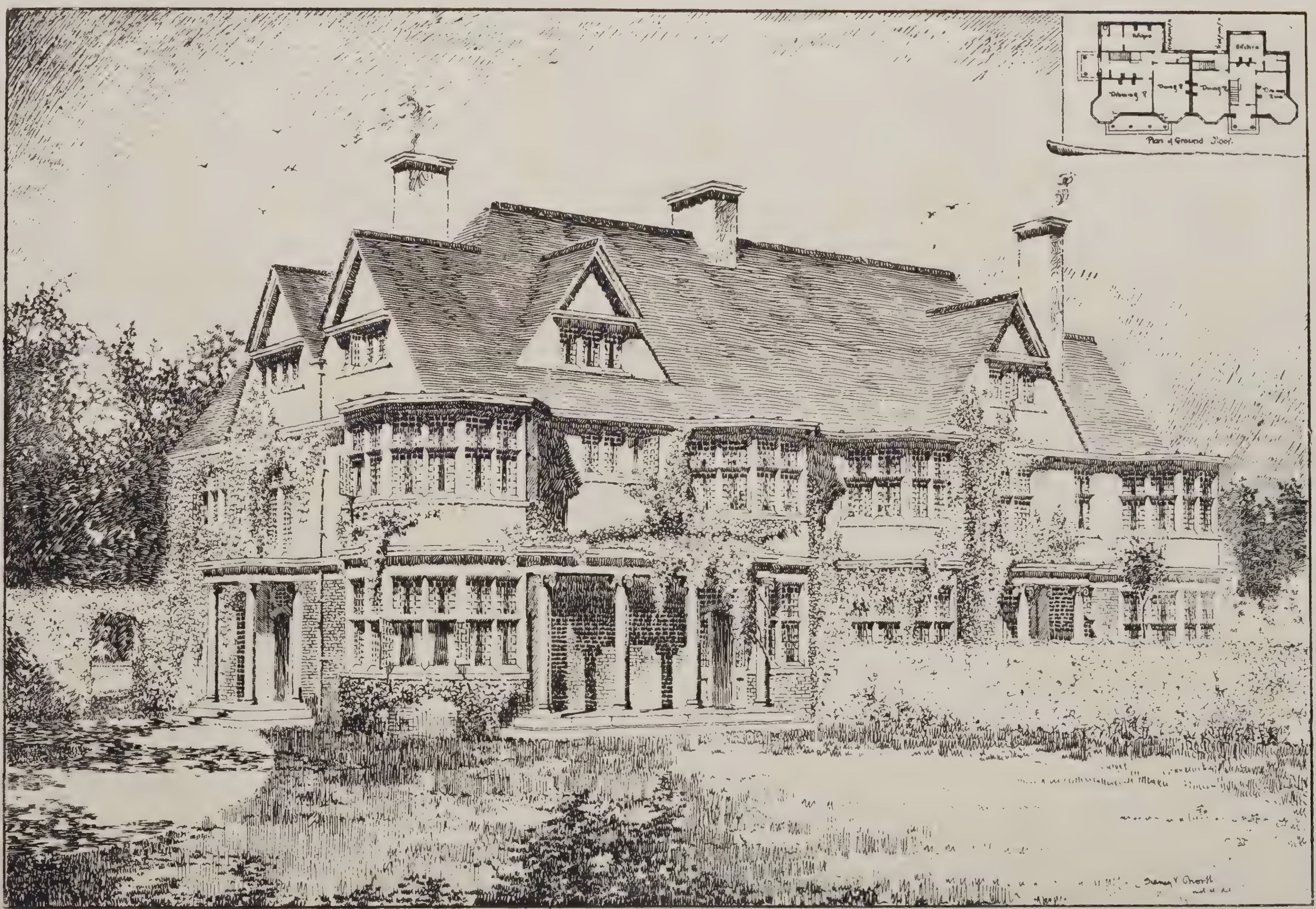

HOUSE AT SOUTHBOROUGH, TUNBRIDGE WELLS. Sidney V. North, A.R.I.B.A., Architect.

Supplement to
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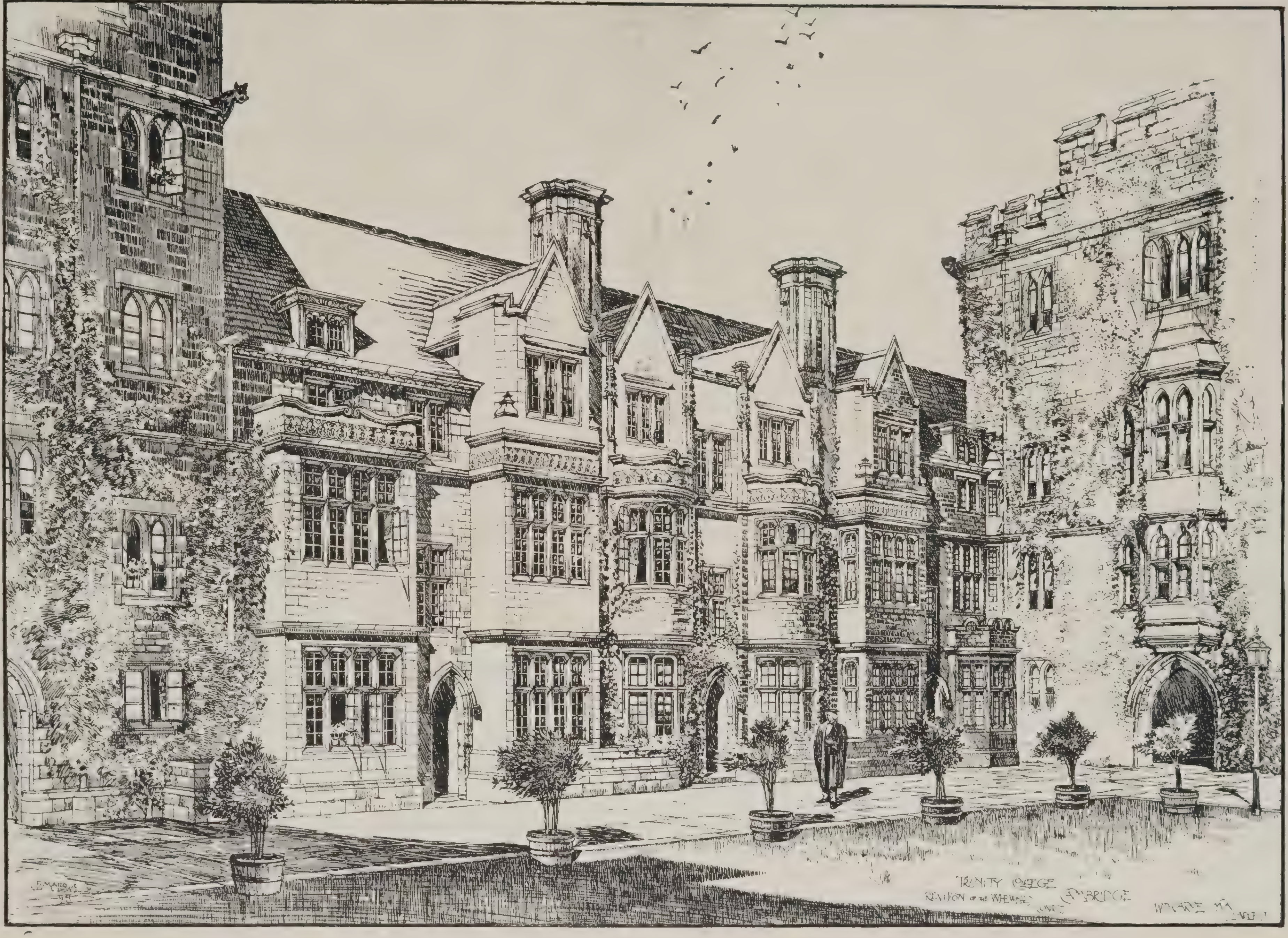
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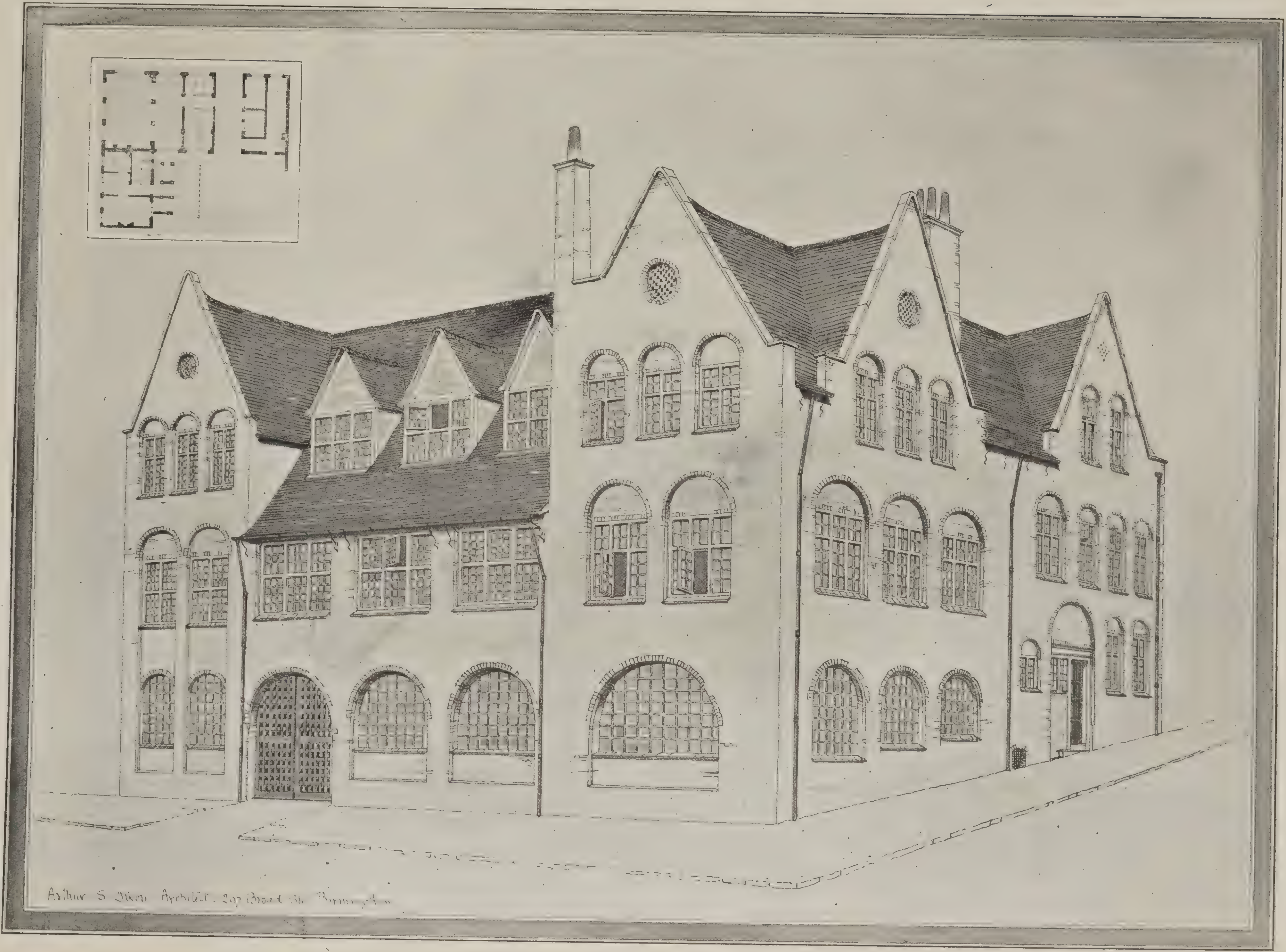

WORKSHOPS FOR THE BIRMINGHAM MUNICIPAL SCHOOL OF HANDICRAFT. ARTHUR S. DIXON, Architect.

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Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Openings for Architects' and Builders' Assistants in Canada.

CHELMSFORD.—G. H. writes : "I propose next spring to emigrate to Canada. I am thirty years of age and have had good experience in the building trade, but find it so crowded here that a bare living wage is all I can command. My education has been good and I have plenty of energy. Do you think I might reasonably hope to succeed out there ?"

Obtain from the Emigrants' Information Office, 31, Broadway, Westminster, S.W., the quarterly circular on Canada and the Australasian and South African Colonies (free), a copy of their handbook on Canada (price 1d.), and one of their "Professional Handbooks" (price 3d.). Also write to the "Canadian Architect and Builder," published by the C. H. Mortimer Publishing Co., Confederation Life Building, Toronto, Canada.

Septic Tanks.

NOTTINGHAM.—X. Y. Z. writes : "I have understood until recently that in the septic drainage system the septic tank should be constructed so as to exclude light and air as much as possible in order to encourage the microbes in their work, but I am now informed that *open* tanks are being used and are just as effective. Where can the latest and most trustworthy information be obtained, other than that contained in Sutcliffe's 'Modern House Construction'?"

Numerous methods have been devised for the systematic utilisation of bacterial agency in sewage purification by the construction of tanks, contact beds, &c. Amongst these may be mentioned the Exeter or septic tank, Scott-Moncrieff, Dibdin, Lowcock and Ducat systems. Each method claims certain advantages. One of the best books dealing exhaustively with the general principles underlying bacterial sewage purification and describing the various systems introduced is "Sewage, and the Bacterial Purification of Sewage," by Dr. S. Rideal, D.Sc., published by R. Ingram, Pleydell Street, Fleet Street, E.C. ; price 14s. T. E. C.

Paint on the Eiffel Tower.

STOCKPORT.—STOCKPORT writes : "What kind of paint is used for the ironwork at the summit of the Eiffel Tower, Paris ; how is it made ; what is its composition and its price ; where can it be obtained ; and how long is it supposed to last ?

We are unable to supply the required information. Red lead is considered to be the best paint for iron, and it may be used with boiled oil and a little turpentine for the first two coats. The iron must be thoroughly dried before painting. Perhaps querist may find some information in the paper on "The Preservation and Ornamentation of Iron and Steel Structures" in the Transactions of the Society of Engineers for 1883" (E. & F. N. Spon, Ltd., 125, Strand, W.C. ; price 10s. 6d). Last year "Hints on Painting Structural Steel" was published by the U.B. Publishing House, Dayton, Ohio, U.S.A. This little book, though it contains no mention of the Eiffel Tower, supplies much information on the composition of paint. It is intended to be a study of practical conditions in steel-making, the reasons for failure in metal coverings, the character of the materials to be used and the best methods of protecting steel products.

Renaissance Buildings in Bath.

LONDON, N.W.—P. J. H. writes : "What Renaissance buildings in Bath would be suitable to measure for the R.I.B.A. final examination ?

The best Renaissance buildings in Bath are undoubtedly the modern works of the late J. M. Brydon, such as the Art Gallery and Library. But why not measure the ancient Roman Bath itself ? It is small and in a comparatively good state of preservation, and one of the very few examples of actual classic architecture within easy reach of the English student, outside the British Museum.

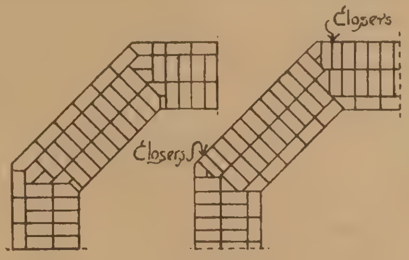
G. A. T. M.

Bond of Octagonal Shaft.

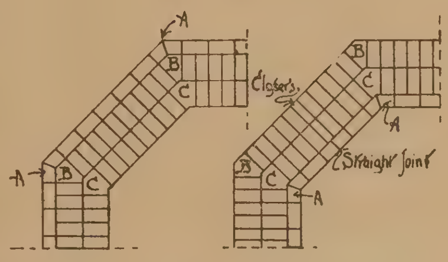
WALTHAMSTOW.—C. J. W. writes : "Which is the correct way to set out the bond of an octagonal shaft ? Would it be correct to set it out from the centre of each panel, with cut bricks at each angle, or start from the angle of each panel and work to the centre, having the cut bricks in the centre ?"

Neither method is more "correct" than the other. It is purely a question of balancing the advantages of each, and consequently plans are given of two courses of each of two systems. Referring to the accompanying illustrations, bond No. 1 is devised from the centre, with closers and cut bricks at the angle, and is obviously much more troublesome and more likely to be badly done than is bond No. 2 with its specially made angle bricks, marked A, B and C, and its closer or cut brick in the middle. In any event, having closers near the angles means *two* weak places on each face, and closers in the middle only *one*. On the other hand, in an uniformly tapering chimney the effect of central closers would be to accentuate the taper to all appearance, and probably the chimney would not look quite so well as if the closers were near the angles ; but appearance is of much less moment than stability in such a case as this.

G. A. T. M.



BOND NO. 1.



BOND NO. 2.

BONDS OF OCTAGONAL CHIMNEY SHAFT.

English Renaissance Architecture.

BRADFORD.—BRADFORD writes : "Which is the best part of England for studying Renaissance architecture, London excepted ? I am thinking of spending five or six days measuring and sketching old buildings. Please state what places I might visit in that time."

Where many districts are good it is a trifle difficult to say at once that one is best, but the triangle lying between Leicester, Peterborough and Northampton would be hard to beat for beauty and variety of English Renaissance architecture, mainly Elizabethan. The principal buildings would include Apethorpe Hall (two miles from King's Cliffe) ; Burghley Hall, Stamford ; Kirby Hall, near Weldon ; Rushton Hall, with its triangular lodge, near Kettering ; Rothwell Market House ; the town of Oundle, which contains much seventeenth-century work ; and Canons Ashby,

G. A. T. M.

Sketching at Leicester.

SOUTHPORT.—H. L. writes : "Kindly name some places in or within a few miles of Leicester that are suitable for sketching and measuring."

This is to a great extent answered in the reply to "Bradford," Yorkshire. In the town of Leicester there is the so-called Saxon church of St. Nicholas and three other good churches, St. Mary, St. Martin and St. Margaret ; while the town and county gaols were built respectively in 1792 and 1791, and the Free Grammar School in 1573. G. A. T. M.

Water for Boilers.

BARNSLEY.—G. W. S. writes : "What is the effect of rainwater on a cast-iron and on a wrought-iron boiler ? What kind of a boiler would be most durable for a small supply when rainwater is to be used ? We have at present a wrought-iron boot-boiler. The only alternative kind of water we have is extremely hard, and it coats the inside of boilers, &c., with a hard limey substance, which very soon blocks up the pipes. Will you kindly say what is the cause of this, and whether it could be cured ? At another place we have a large steel steam-boiler, the water supply to this being mixed, partly spring and partly rainwater ; it has become so very deeply pitted all over the inside so that it is about done. It has been worked about there days a week, and has only had a life of ten years. Will you please tell me what is the cause of this, and what would be the best remedy ? Is the rainwater the cause of the mischief ? This is the cause the boiler-maker gives for it, but I do not know whether he really understands. I can scarcely think the rainwater is the sole cause."

Steel is more liable to corrode than wrought-iron, and the latter more than cast-iron. Corrosion takes place more rapidly when partially exposed to wet than when wholly dry or covered with water. Iron in a state of vibration rusts more slowly than when at rest. Iron-rust is chiefly red oxide of iron with a little ferrous oxide and carbonate, and is produced by the action of the moist carbonic acid of the air and subsequent oxidation. It will thus be seen that rainwater, which contains a considerable quantity of carbonic acid, formed by the absorption of carbon dioxide (commonly called carbonic acid gas) from the atmosphere in falling, is more corrosive than water which contains a less quantity of free carbonic acid. The hardness of water is generally due to the solution of chalk by the carbonic acid in rainwater, which falling upon the surface of the ground soaks through the chalk, dissolving some on its way, reappearing as springs or is obtained from wells. When this hard water is heated the carbon dioxide is driven off and the dissolved chalk is precipitated to the sides of the vessel, forming the furr or calcareous coating our correspondent refers to. This hardness can be removed by adding lime to the water before admission to the boiler, the lime combining with the carbon dioxide to form chalk which is precipitated and with it the chalk originally held in solution by this same carbon dioxide. The water must be allowed to stand for some time to allow the chalk to settle. This process of softening water is known as Dr. Clark's. The hardness that can be removed by boiling is termed temporary hardness, but there is a permanent hardness which prevents soap lathering, due to calcium or magnesium sulphates or chlorides, which is not removed by boiling, for these compounds are soluble to a considerable extent in pure water, but as they are not deposited are not objectionable in a boiler. Another method of removing temporary hardness is by adding sal ammoniac, which decomposes the chalk and itself into ammonium carbonate, which volatises with the steam, and the very soluble calcium-chloride which remains in the boiler. When the water becomes after a time too much impregnated with this latter it has to be emptied and refilled. In reply to the other queries, a cast-iron boiler would be most durable for a small supply with rainwater ; the pitting of the steel boiler is due to the intermittent working, its being of steel, and the use of rainwater. We would advise the use of a cast-iron boiler, filled with water when not working, and softened spring or well water, not rainwater. If of steel, the same recommendations apply.

SOUTH KENSINGTON EXAMINATIONS.

QUESTIONS AND ANSWERS IN BUILDING CONSTRUCTION.—Honours: Part 2.

[NOTE.—The questions and answers in the Elementary stage were published in our issue for June 12th, those in the Advanced stage in the issue for June 19th, and those in Honours, Part 1, in the issue for June 26th. In the Honours examination, Part 2, it was not allowable to answer more than five questions, one of which, and not more, was to be selected from each of the first two divisions. No candidate was eligible for this examination who had not obtained a previous success in Honours, Part 1.]

DIVISION I.

61. *Sketch as Grecian Doric—stylobate, column and entablature (at a corner); show entablature up to next column. Sketch vertical section of entablature, also profile of capital, a quadrant of the cross-section of the shaft, and any other details you think necessary to explain the order.*

62. *English pointed architecture: draw elevation of upper part of a three-light window with tracery; give half cross-section across lights; give profile of section of moulding of window head, extending it into the tracery. State the period your drawing illustrates, and explain its special marks and tokens.*

We do not think it necessary to give these sketches. In answering question 62 it would be advisable to give an example illustrating a definite style, not a transition example.

DIVISION II.

63. *Write a specification for a water-closet on a first floor; the space is 8ft. by 5ft. and 10ft. to ceiling; the door is to be in a 5ft. side, the wall opposite door and the wall to the right are outside walls, and they show surface damp though apparently dry when cut into; the wall to the left and that in which the door is are stud partitions. The joists of an existing floor run lengthwise of the space; they are 10in. deep, 13ft. between their bearings, extending across the passage outside the door; the water-supply enters from above in the left-hand corner. The work is to be of the best kind, with floor tiled and walls for a height of 4ft. 6in. also tiled; provide also washhand basin and waste, and complete the work to connection with sewer (inclusive); the sewer is within 10ft. of the bottom of the wall (opposite to the door); provide window. Illustrate clearly by sketches and specify exactly. Floor, door, window, plastering, &c., all included.*

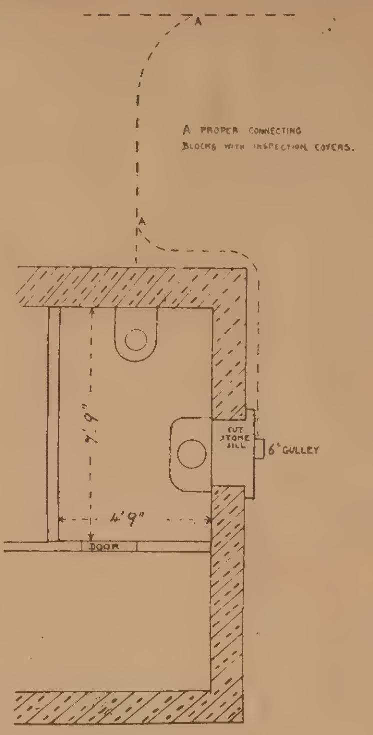
Specification of works to be done for such alterations in the existing building as shall be necessary, and to complete all the works herein specified to construct a water-closet, &c., at
for

All the materials shall be the best of their several kinds. All dimensions given are to be taken as finished dimensions. The work shall be done by capable men under proper and sufficient control.

The contract embraces and includes all items of tools and other appliances, labour and materials, and the proprietor shall have delivered to him on or before the day of a complete work perfect in every respect, all reinstatements executed and the place given up in clean tidy condition.

Excavator.—The necessary excavation and refilling shall be made for connection with the drain and for the drain.

Mason, &c.—The opening shall be carefully made for the window specified below, and for the soil and waste exits. The drains shall be carefully laid and connection made as shown on sketch. The concreting for tiling shall be composed of 1 part Portland cement and 5 parts coke broken to the proper sizes. It shall be laid on the place prepared for it and finished smooth for tiles at one operation. The tiler shall see that the walls are properly prepared for the tiles. The tiles shall be: for the floor No. , and for the walls No. ————————'s catalogue. Build in window and make good soil and waste openings.



SOLUTION TO QUESTION 63.

Carpenter and Joiner.—The flooring boards shall be taken up, side slips shall be nailed against the joists 4in. down, and the top corners shall be roughly chamfered off; the old flooring boards shall be cut in short lengths and placed between the joists resting on the slips.

Provide and fix complete window 5ft. by 2ft 6in. (sash dimensions), with 2in. sashes, double-hung single-pane sashes, glazed with obscured glass in lower sash; pulley-boxes, fastener, jamb-linings, 5in. architraves; to be at a level to suit height of washhand basin, and to be finished neatly. Batten the two outside walls for plasterer. Place in stud partition a 7ft. by 2ft. 9in. by 2in. framed and panelled door, to match in every respect the other doors in the passage, complete with frame, mortice-lock and special inside bolt; three 4in. hinges; inside architrave 5in.

Provide and fix proper ways and covers for pipes, the covers to be put on with screws. Timber to be best red Baltic.

Plasterer.—The outside walls shall be well raked out to the height of the wall tiling, and worked out in cement to the proper thickness, so that the surface of the tiles and plaster will be in the same plane. The stud partitions shall be lathed for this height, with expanded metal between the lathings. It shall be lightly filled with wood shavings to prevent cement plaster going through and falling down. It shall be properly plastered in cement mortar for the tiler. The walls shall be finished with three-coat work in grey, fit for painting. The cornice shall be brought out to suit battened walls.

Plumber.—Provide complete closet No. ——— ———'s catalogue, and No. ————————'s catalogue washhand basin. Fix as shown on sketch. Connect water-supply. Soil-pipe shall be 4in. heavy cast-iron, coated with Dr. Angus Smith's solution. Leaded joints properly connected to drain, rising 2ft. over eave, and finished with copper-wire dome. Soil-pipe from closet to be of 4in. heavy lead, having brass thimble for leading into branch of cast-iron pipe. Bath waste to similarly connect with 3in. outside waste, discharging over 6in. gulleys connected with drain.

Painter.—The door, window and casing to be primed, knotted, stopped, &c., four coats plain (other painter's work shall be postponed till plaster is seasoned).

64. *Write a specification for a lean-to conservatory 20ft. by 10ft.; break a door from drawing-room; provide door from outside. Sash bars iron. Sketch plan, and front and end elevations; the work is to be of a good class; glaze, supply stands, &c., complete.*

Specification of works to be done to supply and erect complete in every respect a conservatory at for ,

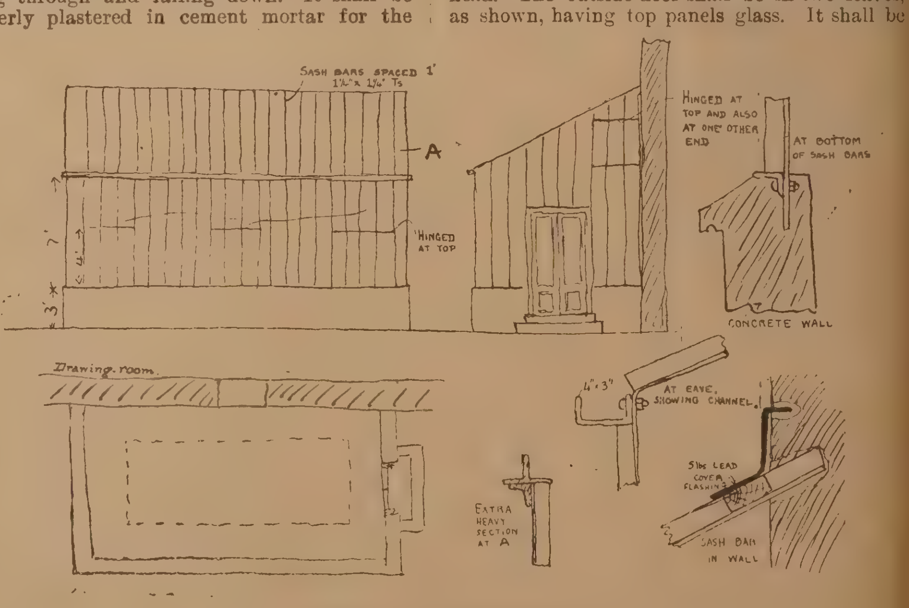
All the materials shall be the best of their several kinds. Any dimensions specified are to be finished dimensions. The work shall be done by capable men under proper and sufficient control.

The contract embraces and includes all items of tools and other appliances, labour and materials, and the proprietor shall have delivered to him on or before the day of a complete work perfect in every respect, all reinstatements executed and the works given up in clean tidy condition.

Excavator.—Excavation shall be made 2ft. deep and 2ft. wide for the foundation of the wall.

Mason, &c.—The wall shall be of concrete resting on a concrete footing 9in. deep and 15in. wide. The wall shall be 9in. thick. It shall rise to the height shown, it shall have the sash bars let in as shown, and it shall be finished smooth in cement mortar. The path round the stands shall be 2ft. 6in. wide of red 6in. tiles on concrete foundations 6in. thick, and this shall rest on a sufficiently hard foundation (stones or brick rubbish: the margin and space under stands shall be filled with good vegetable soil). The door into drawing-room shall be carefully broken out, and the door-frame properly built in and made secure.

Carpenter and Joiner.—The door and door-frame from the drawing-room shall be complete in every respect, with brass mortice-lock, three 4in. wrought-iron butt hinges, architraves, &c., to match the other doors, except that this door shall have the stiles, &c., narrowed to 2in. and have two plate-glass panels from lock-rail to head. The outside door shall be in two leaves, as shown, having top panels glass. It shall be



SOLUTION TO QUESTION 64.

a 2¼in. thick framed door in a 3in. by 4in. frame with three pairs of heavy 4in. wrought-iron butt hinges, top and bottom heavy tower bolts, and a good heavy mortice-lock having heavy brass handles on other leaf.

The stands shall be of 1½in. stuff well nailed to sufficient bearers.

Ironwork.—The sash bars shall be continuous. They shall enter the wall of the house, in which they shall be given a good hold (6in.) secured with cement mortar. They shall also enter the concrete wall. The sketches show some details. The sizes shall be extra large—for sides of door, sides of ventilating openers, and at corners, 2¼in. by 2¼in. ┬s. The opening lights shall be made with welded └-iron rim; sash bars, riveted. Good strong hinges and casement fasteners.

Glazier.—The glass of roof shall be ⅛in. thick, Hartley's rolled plate; in walls 32oz. sheet glazed on primed sash bars with raw oil putty.

Painter.—The whole shall be painted with four coats of best white lead and oil paint.

Plumber.—The flashing shown shall be put on in short lengths housed into a regular and sufficient raglet and made good with cement mortar.

Heating.—Provide sufficient small-bore high-pressure tubes under stand for heating. Carry pipe in suitable jacketing to laundry fire, in which place a proper coil. Supply expansion-pipe, test cocks, &c., complete.

DIVISION III.

65. *What is meant by saying that the height to which a pyramid of any building material may be raised is three times the height of a column of uniform section? Show how, by attending to a cardinal principle of construction, you can build a tower of brick or stone of very great height.*

A column of uniform section should be no higher than the number of ft. equal to the number of cub. ft. of the material which will make the safe load per sq. ft. The volume of a pyramid or cone is one-third of the volume of a column of uniform section on the same base and of the same height: and the same material will reach three times the height of a column if shaped as a pyramid or cone.

It is following a cardinal principle of construction to make your material do equal duty everywhere, as nearly as possible. In a column. each course has less to do per sq. ft. as it rises The area is constant, and the volume diminishes as the upper fraction of the height. In a cone or pyramid the area diminishes as the square of the upper fraction of the height, but the volume diminishes as the cube, *i.e.*, more rapidly. What we have to do is to shape our tower so that the weight on any cross-section will bear to the cross-section a constant ratio.

66. *With reference to the previous question:—A brick tower of efficient design is built on a square base 60ft. by 60ft.; it is 500ft. high. Allowing 6 tons per square foot as the safe load on a cross-section, and taking 120lbs. as the weight of a cub. ft. of brickwork, what is the area of the top? What weight in tons may be safely placed on the top?*

Given:—log. 111 = 2·04532, *log.* 112 = 2·04921, *log.* 4086 = 3·61130, *and log.* 36 = 1·55630. *You may assume* 1*ft. courses.*

Take 1 sq. ft. of base. Weight of a 12in. course (a cubic foot) $= \frac{120}{2240} = \frac{3}{56}$ tons. The area which will carry this load at 6 tons per sq. ft. $= \frac{3}{56 \times 6} = \frac{1}{112}$ sq. ft.

∴ each area should diminish by $\frac{1}{112}$th of the area of the course immediately below it if we assume 12in. courses.

$$\text{Area}_0 = 1.$$

$$\text{Area}_1 = 1 - \frac{1}{112} = \frac{111}{112}.$$

$$\text{Area}_2 = \frac{111}{112} - \frac{1}{112} \times \frac{111}{112} = \left(\frac{111}{112}\right)^2.$$

$$\text{Area}_3 = \left(\frac{111}{112}\right)^2 - \frac{1}{112}\left(\frac{111}{112}\right)^2 = \left(\frac{111}{112}\right)^3.$$

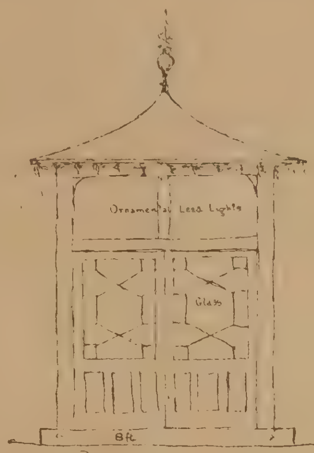
$$\text{Area}_n = \left(\frac{111}{112}\right)^n.$$

$$\therefore \text{Area at 500ft.} = 3600 \times \left(\frac{111}{112}\right)^{500}.$$

∴ log. area = log. 3600 + 500 (log. 111 − log. 112).

Area at top = 40·86 sq. ft., and at 6 tons to the sq. ft. it will carry 245·16 tons. The question is a compound interest question

67. *A well 20ft. deep affords at all times a supply of 1,000 galls. a day, sufficient for a country house; the well is 150ft. away from the house; the tank for a proposed water-supply may be placed in the roof between two king-post trusses of 25ft. bearing, but these will require to be strengthened. Design shelter for hot-air engine, which being in front of the house should be nice; provide for engine, piping, tank, &c., complete.*



SOLUTION TO QUESTION 67.

If we make a tank to hold 1,000 galls., which is advisable, the tank, when filled, will weigh (approximately) 5 tons. The king-post truss will provide sufficient lateral stiffness: it will be sufficient to bolt on to its members 4in. by ¼in. plates, making a jointed structure of the plates. Proper cross-bearers should he laid from tie beam to tie beam, and a regular floor should be formed and covered with a tray of lead turned up at the edges, with a proper overflow to the outside of the roof. The tank should be made of 2in. timber well bound and tied across the top and lined with 8lb. lead. It should rest on the tray, and be of such dimensions as will best fit the roof and hold 1,000 galls. The service pipe should come from the bottom. The tank should have an overflow of sufficient capacity led outside the roof. There should be a ball-valve on the supply main, but care must be taken if this is done to have one—or better two—relief valves on the main, which will lift and give relief when the engine pumps against the closed ball-valve.

The pumping engine should be as near the well as possible, because the shorter a suction pipe is the better. The shelter for the pump need not be large. It is not much larger than will hold the hot-air engine and a small box for coke. It is convenient to have this in the shape of a square kiosk, the four sides to open on hinges like doors so that every part of the engine may be easily got at for cleaning and repairs. The roof to be of lead and the sides of glass so that the engine may be seen at work from the outside. One of the relief valves (set easiest to open) should be here to give warning that the tank is full.

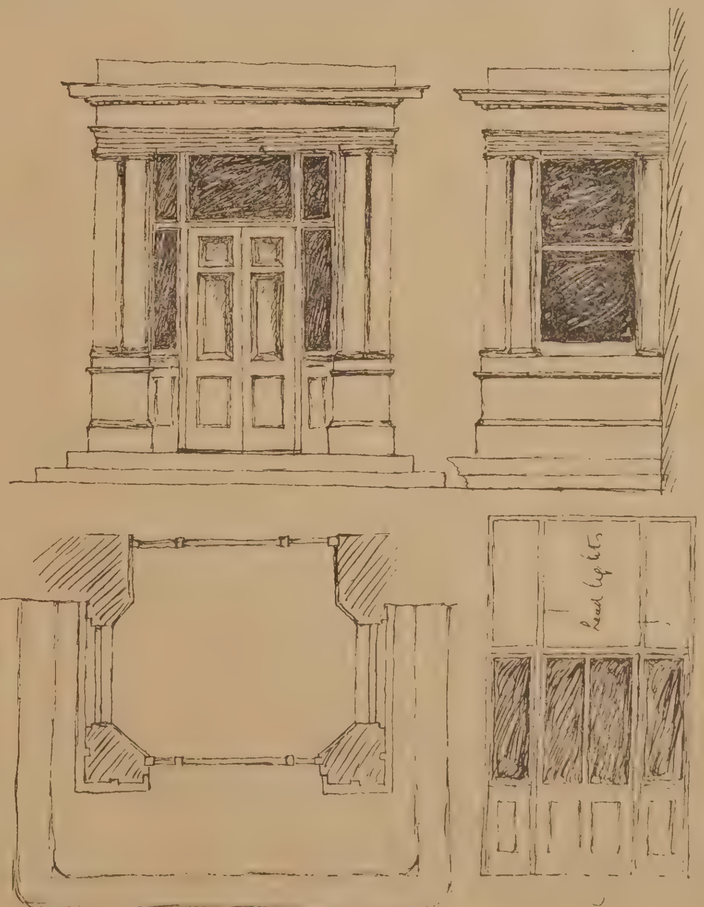
The engine should be ½ h.p. to enable it to take the load easily and to provide for its having to work no more than a reasonable time per day. There should be a hand pump independent of the pumping engine, to provide for accident and repairs. The pipe should be heavy 1¼in. lead pump pipe.

68. *Design and sketch two elevations and sectional plan of a porch for a country house (any style); show elevation of glass door and screen to vestibule. Give full details of your proposals, both by sketches and explanations in writing; take rough quantities and estimate the cost.*

(See accompanying illustrations.)

It is necessary to have the porch enclosed. It is also generally advisable to have as much light through the vestibule door as possible: for this reason plenty of light is provided in the porch and the panels and sidelights of the vestibule door are in plate glass. The top lights may be in lead-lights.

It is proposed to build the porch in clean small stones and cement mortar (or concrete) finished in cement.



SOLUTION TO QUESTION 68.

	£	s.	d.
Concrete, 8 cub. yds. at £1 10s.	12	0	0
Doors and windows, 210 sq. ft. at 5s.	52	5	0
Plasterwork outside	10	0	0
Ceiling jambs, &c., inside to be finished in pitch-pine	10	0	0
	£84	5	0

The concrete top should be well let into the wall of the house, and if this work is carefully done no lead will be needed for the top of the porch. The foundation being rock, the concrete will stand without lintels of any kind.

69. *Design and sketch a double labourers' dwelling in a rural district; show the necessary conveniences and the enclosure. The site is close to a public road. Take accurate quantities and price them.*

(See accompanying sketch.)

Quantities.

	£	s.	d.
Excavation, 49 cub. yds. at 1s.	2	9	0
General levelling and settling, say	2	0	0
	4	9	0

Bricklayer.

52½ft. × 15ft. × ¾ft. wall of house
¾ft. × 18ft. × 5¼ft. × ¾ft. gables
70ft. × 5ft. × ¾ft. boundary
6ft. × 2½ft. × ¾ft. } privy
12ft. × 9ft. × ¾ft. }
20ft. × 10ft. × ⅜ft.
6ft. × 12ft. × ¾ft. } breasts and
4ft. × 10ft. × ¾ft. } stack
} 1158 cub. ft.

— Less doors, windows and gate:

2ft. × 3½ft. × 2 ft. × ¾ft.
4ft. × 4½ft. × 2ft. × ¾ft.
3ft. × 6½ft. × 3ft. × ¾ft.
2ft. × 6½ft. × 3ft. × ⅝ft.
2ft. × 3ft. × ¾ft. (allowing for pillar) gate.
} —134 cub. ft.

	£	s.	d.
38 cub. yds. at 40s.	£76	0	0

Drain.

	£	s.	d.
Drain, 9yds. 6in. stoneware at 3s. 6d.	1	11	6
1 small gulley and setting, 15s.	0	15	0
	£2	6	6

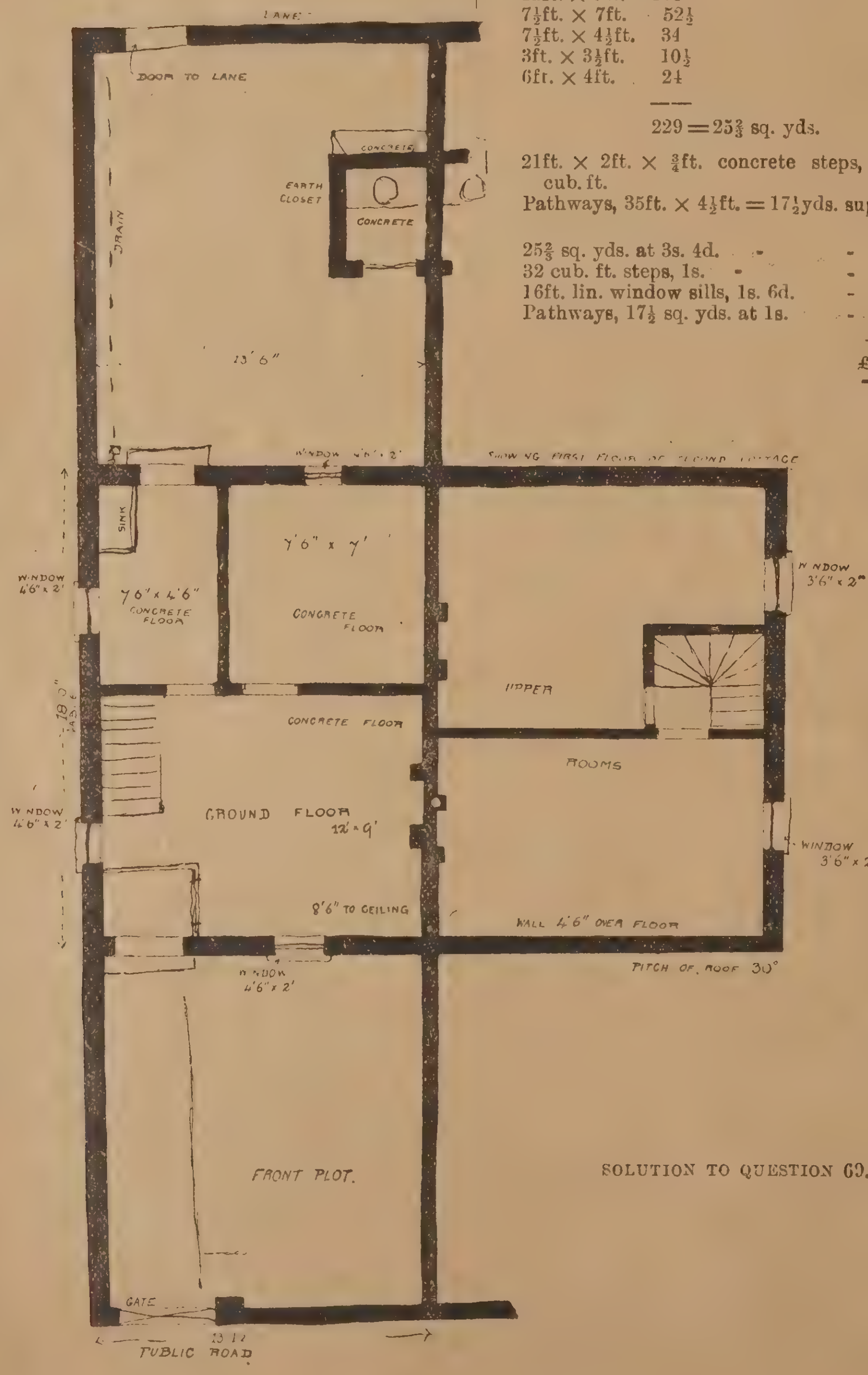
Concrete Floors, &c.

12ft. × 9ft.	108
7½ft. × 7ft.	52½
7½ft. × 4½ft.	34
3ft. × 3½ft.	10½
6ft. × 4ft.	24
	229 = 25⅔ sq. yds.

21ft. × 2ft. × ¾ft. concrete steps, say 32 cub. ft.

Pathways, 35ft. × 4½ft. = 17½yds. super.

	£	s.	d.
25⅔ sq. yds. at 3s. 4d.	4	5	5
32 cub. ft. steps, 1s.	1	12	0
16ft. lin. window sills, 1s. 6d.	1	4	0
Pathways, 17½ sq. yds. at 1s.	0	17	6
	£7	18	11



SOLUTION TO QUESTION 69.

Carpenter and Joiner.	£	s.	d.
1·8 squares flooring at £2	3	12	0
Stairs	4	0	0
4 windows at £2 complete	8	0	0
2 " " £1 15s.	3	10	0
1 gate complete	1	0	0
2 doors at £2 10s.	5	0	0
3 doors at £2	6	0	0
1 privy seat	0	7	6
1 scullery sink	0	10	0
2½ squares partitions, sheeted both sides, doors included, £2	5	0	0
	£36	19	6

The roof shall have rafters cleaned and sheeted with ¾in. tongued and grooved flooring, felted and slated. All is included in a general price per square.

Ironmonger.

	£	s.	d.
Locks and hinges	1	10	0
Iron gate	1	0	0
Three grates, average 15s.	2	5	0
	£4	15	0

Eave gutters and spouting included in price for roof.

Roof.

19ft. × 14ft. × 1·16 = 2⅔ squares.

	£	s.	d.
2⅔ squares at £6 5s.	16	13	4
Privy roof, ¼ square	1	11	3
	£18	4	7

No plastering.
Glazier included in doors and windows.
Painting, £3.

Collected:—

	£	s.	d.
Excavation, &c.	4	9	0
Bricklayer	76	0	0
Drain	2	6	6
Concrete and pathways	7	18	11
Carpenter and joiner	36	19	6
Ironmonger	4	15	0
Roof	18	4	7
Painting, lump sum	3	0	0
Total for a single house	£153	13	6

70. *Draw up a specification and give careful and minute instructions for the inside repairs and thorough cleaning, painting and decorating—including outside painting, &c.—of a town house of, say, £100 valuation. How would you arrange to get tenders, and what steps would you take on accepting a tender? Carry out the complete work as agent for the owner.*

You are to design schemes of colour and decoration for the principal rooms.

Specification of works to be done to repair inside and paint the house No. for

The contract shall embrace and include every item of every kind necessary for the complete execution of the work, workmanship and materials being everywhere of the best description.

The whole of the house from top to bottom shall be thoroughly washed down and cleansed. Ceilings shall be washed clean, old paper removed, painted work shall be pumiced smooth or the paint removed by burning, and any loose paint on painted walls shall be scraped off.

The drawing-room shall have the ceiling in light sulphur-yellow, the cornice picked out in white and shades of warm yellow: the enrichments in various shades, and the prominent parts gilt. The frieze shall be of a warm terra-cotta colour, and the walls below the picture rail light sage-green. The dado, which is in low relief lincrusta, shall be cream tinted white. The ceiling and frieze shall be in Duresco, and the enrichments, walls and dado in oil paint finished flat. The doors, windows, trimmings, shall be in best white enamel with gold lines on the mouldings. The floor-margin shall be stained dark-oak colour.

The dining-room shall have a blue ceiling: cornices and enrichments in shades of gold-yellow picked out in gold; frieze of light chocolate, walls darker, dado dark. Doors and trimmings, &c., to be of Indian red enamel. Library with light-green ceiling, shades of green on cornice, and enrichments in light orange; frieze walls dark sage-green, doors, trimmings, &c., in dark-green enamel. Breakfast-room same as dining-room, but with lighter shades. Floor margins stained dark and varnished.

All the work shall be done in the best manner, and so many coats shall be given as shall be sufficient to bear out and give a uniform finish and tint at every part. Before the work has proceeded too far the contractor will draw up a complete detail scheme showing his interpretation of the colours specified; and when this is agreed to by the architect he will sign it as having been approved.

Specify repairs to plaster, windows, doors, trimmings, mantelpieces, locks, keys, handles, window-fasteners, grates, ranges, flues, gas and electric fittings, water-pipes, bath and water-closets, cocks, traps, pipe casings, sash cords, broken glass, blind furniture, bells; lacquered work to be redone, polished work repolished, &c.

Outside painter's work—windows, doors, ironwork, stucco (after mending). Entrance door in hard varnished colour. The other work in plain colour as shall be directed.

Basement walls and ceilings in Duresco, woodwork plain painted. Bedroom ceilings distempered, tinted to match papers, cornices picked in colours, walls papered, woodwork flat tinted to match papers. Papers to average 1s. 6d. a doz. Margins of floors stained and varnished dark oak. Staircase, ceiling, distempered walls papered 2s. 6d. a doz., and varnished dado and margins painted; doors enamelled cream-white. Greenhouse painted white inside and outside. All things usually painted are included in the above, and all things are to be done to make the work perfect in every way, equal to the best work done.

Have this specification manifolded on the typewriter, and send it round to a few house-painting contractors asking for proposals. Select a contractor to the best of your judgment, prepare a short agreement for him to sign, and see that he carries out the work in accordance with the agreement. Inspect the work in progress, and pay reasonable instalments for any work completed.

Surveying and Sanitary Notes.

New Refuse Works at Gallangad for treatment of the scavenging refuse of the Vale of Leven have been opened. The works consist of brick buildings in which are placed machinery and apparatus for separating the rough material from the manure, this screened manure being considered saleable and of use to farmers. The motive power is a 7-brake h.p. oil engine. A railway siding has been constructed about a quarter of a mile from Caldarvon Station, and ten waggons have been purchased to convey the refuse from Alexandria.

Lifting a Street. — The Northwich Urban Council have commenced the stupendous task of literary lifting all the shops and buildings in Northwich High Street. This has been rendered necessary by the gradual subsidence of the street, which has sunk 4ft. 6in. during the last eight years. It is now to be raised 3ft. 6in., the buildings being lifted by hydraulic jacks. Some shops in which business is being carried on as usual are wedged up 4ft. or 5ft. above the present road level. A portion of the heavy expenditure entailed by this "shop-lifting" will be borne by the Salt Compensation Board.

Lime Water for Street Watering. — Dr. A. Eddowes, writing to a medical journal, suggests that the use of lime water, prepared fresh, for watering the streets in hot weather would prove to be a practice productive of sanitary comfort. The advantages claimed for the practice are said to be those, first of aggregating together loose particles of manure and thus to prevent them being diffused by the wind; second, of exercising a certain antiseptic action; third, of preserving wood paving; and, fourth, of rendering wood less slippery. The idea should be worth considering by the local authorities entrusted with the care of the streets, and an energetic surveyor might make trial of Dr. Eddowes's plan on an experimental basis.

The Drainage of Paris.—At various times within the last eight years notice has been given by the Paris municipal authorities that within a certain period after the completion of stated portions of the sewerage system the owners of houses within the district concerned would be obliged to connect their houses with it; and in 1897 a list of streets, comprising the greater part of all the streets in Paris, was published, with a formal notice that all buildings abutting on those streets must be connected with the sewers in them before the first day of January, 1901. This order, which gave more than three years for making connection, hardly seems unreasonable, but the Parisians did not think it necessary to hurry themselves, and connections have been made only at an average rate of about two thousand a year. Now the time allowed for making them has expired, and there are still more than twenty thousand buildings in the district without sewer connection. In addition to these, new sewerage districts have been formed and similar notices issued for them, so that thirty-five thousand additional houses must soon be connected with the new sewers, the limit of time for most of them being January 1st, 1904. The Municipal Government, very naturally, does not like to see its ordinances disobeyed, and is considering what steps should be taken in regard to the delinquents; while the latter, who plead as an excuse the difficulty due to the increased demand of getting competent workmen to lay house-drains have formed a "Houseowners' Protective Association" to resist as a body, if necessary, attempts to discipline individuals. How the affair will be settled it is difficult to say. With sixty thousand of the great Parisian tenement-houses to have their plumbing rearranged and connected with the sewer within the next three or four years, the demand for plumbers, which has hitherto made it difficult to finish two thousand houses a year, is not likely to diminish.

Artificial Asphalt Pavements.—Nearly 40,000,000 sq. yds. of artificial asphalt pavements have been laid in the United States. The practice is to lay a binder course immediately on top of the concrete foundation. This binder course is a mixture of stone broken to from ¾in. to 1in. and asphalt cement, and is laid in thicknesses of 1in. to 1½in. The binder is said to prevent the shoving or rolling which occurred when the asphalt wearing surface was laid direct on the concrete foundation. The stone used is first heated, and hot liquid asphalt cement is then added in sufficient quantity (usually 3 to 4 per cent.) to cover each particle of stone. It is important not to add too much of the cement, whilst if too little is used the whole mass will break up under the roller. The wearing surface consists of a mixture of siliceous limestone ground to pass a 200-to-the-inch mesh, with 9 to 11 per cent. of bitumen. The amount of bitumen varies with the quality of the aggregate, and in practice the proper proportion is ascertained by taking a small sample of the hot asphalt mixture and pressing it between two sheets of smooth brown wrapping-paper. If the bitumen is in the proper quantity there will be a scarcely perceptible stain on the paper; but if too much the stain will be blotchy. The proper stain is learned by experience.

Builders' Notes.

Mr. James Palmer, a retired builder, of Hallam Road, Clevedon, died recently at the age of seventy-five years.

Mr. C. Higginbotham, builder, of Castle Street, Dalkey, died recently. He erected a number of houses and terraces in the district, including the new Town Hall, the Parochial House and an addition to Bullock Church.

Mr. James Harris, of The Rest, Commercial Road, E., died recently at the age of seventy-five. The deceased was a native of Tisbury, Wiltshire, and after having been in business as a builder at Corsham and London, he went to Woking forty-four years ago. The business founded by Mr. Harris proved a most successful one, and probably he was more closely identified with the development of Woking than any other resident. His first large contract in Woking was the building of the central hall at the Oriental Institute, and among other buildings which he erected were Christ Church, the Catholic Church in Sutton Park, the Baptist Chapel, Police Station, &c., while as sub-contractor he did a great deal of work at the Crystal Palace.

Mr. S. Hanson Rowbotham, son of Mr. Thomas Rowbotham, the well-known builder and contractor of Birmingham, recently attained his majority, in celebration of which a large number of friends were entertained by Mr. and Mrs. Rowbotham at their county residence, Gilbertstone Grange, South Yardley. A large ballroom and dining-room were erected in the grounds, and in the course of the festivities the health of Mr. Hanson Rowbotham was proposed by Mr. E. Wood, architect, of West Bromwich, Sir James Sawyer proposing the health of Mr. and Mrs. Thomas Rowbotham. The "young master" received his early training in the building trade under the direction of Mr. Henry Martin and Mr. W. H. Bidlake, M.A., and is now engaged in superintending the large building contracts (amounting to about £300,000) being carried out by his father for the Greenwich Union. A gold watch was presented to him by the foreman and office staff in his father's employ.

The German Emperor and the British Fire-Prevention Committee.—At the meeting of the executive of the British Fire-Prevention Committee held last week Mr. Edwin O. Sachs, the chairman, announced the receipt of an appreciative message from the German Emperor in connection with the visit of the committee's deputation to Berlin last month, transmitted through Baron von Richthofen. On the occasion of the opening of the Berlin Fire Congress, the French delegate, acting under instructions from his Government, requested permission to call for cheers for the German Emperor, a courtesy which, coming so officially from France, created a considerable sensation. It was at the subsequent banquet given by the London committee, and attended by the British ambassador, that Mr. Sachs took upon himself to propose the Emperor's health, remarking that, although not instructed by his Home Government, as was the case with his French colleague, such instructions were of course quite unnecessary as far as Englishmen were concerned, seeing what a great pleasure it was to them to acclaim the Emperor as one of the three most popular men in the British Isles. Mr. Sachs' remarks were not only received with considerable enthusiasm at the time, but led to very considerable comment in Germany, as showing the difference between a spontaneous and an official compliment.

London County Council.—At last week's meeting the Finance Committee's return of the estimated and actual cost of works completed during the half-year ending March 31st, 1901, was received and adopted. This showed that the approximate expenditure on estimated works for the half-year was £155,000. On the total amount of work comprised in the statement, namely, £83,924, there was a balance of cost under final estimate of £391, or 0·5 per cent. Most of the works had been carried out at a cost somewhat less than the final estimates as certified by the chief engineer or architect. There were six cases in which the cost had exceeded the final estimate, but in only two was the excess considerable, namely, Redcross Street fire station, £1,023, or about 9 per cent; and Cobham Buildings, £1,129, or about 10 per cent. With regard to jobbing works, the results for the half-year were as follows: 593 works executed at a cost below schedule value of £1,207 7s. 6d., and 621 at a cost of £349 17s. 6d., making 1,214 works executed at a balance of cost below schedule value of £857 10s. 1d., or 6·9 per cent. At the present time the department had twenty-nine works in progress (exclusive of jobbing works), representing a total estimated cost of £733,350, in respect of which work to the cost of £546,507 had been executed up to March 31st, 1901. There were also thirteen other works not begun, the estimates for which amounted to £124,985. The General Purposes Committee reported that they had received a letter from Sir Alexander Binnie resigning his appointment as the chief engineer to the Council, as he desired to enter upon the private practice of his profession (see page xi of our last issue). The committee, reporting upon this, stated that they thought it very desirable that Sir Alexander should retain his position until the end of the year. It was recommended that the resignation should be accepted, and that it should take effect as from December 31st. The report was adopted after several of the leading members had testified to Sir Alexander's service and distinguished ability.

Views & Reviews.

Algebra.

This new elementary text-book on algebra is one of the best we have seen. It is extremely clear in demonstration and is easily read, avoiding the usual faults of science text-books in employing too much summarisation, with sentences often badly phrased and involved. In this book the author, who is the headmaster of King Edward's Grammar School, Stourbridge, has endeavoured to allow the rules of algebra to grow out of the rules in arithmetic, the student thus being led to associate the operations in the former with the operations in the latter, so that one set of rules serves for both sciences. This is undoubtedly the correct method, and has been adopted by all the best teachers and textbooks. Mr. Deakin has also endeavoured to encourage thought from the very beginning, the student being impressed with the importance of examining every question before he begins to work it out and to try to anticipate the answer. A useful chapter is included on mistakes made by beginners in algebra and the detection of these mistakes. The proofs of the rules are deferred to the latter part of the book, when the student has become familiar with the simpler rules, but this has allowed them to be given more fully than is usual with elementary text-books. We are glad to see that a chapter has been included on the graphic representation of functions, not usually dealt with in elementary books, for too often persons go through the various branches of elementary mathematics without any clear notion of their correlation. This is, of course, one of the great objections to the method of dividing science up into numerous divisions. The only adverse criticism we have to make on this book is that chapters should have been given on harmonical progression, permutations and combinations, the binomial theorem and logarithms, which are quite capable of being treated elementarily, and gain by being brought into clear and evident sequence with the remainder.

"The Tutorial Algebra. Part I., Elementary Course." By Rupert Deakin, M.A. Price 3s. 6d. London: W. B. Clive, 13, Booksellers' Row, Strand, W.C.

The Office Proper.

This is a book of systems for office management. The author says in his introduction that whatever else an architect or engineer may elect to put aside as not being absolutely essential to his success in life, he certainly cannot afford to neglect the cultivation of methodical work and a business-like system in carrying on his avocation, and his object in writing this book is to supply the need for a treatise on the business and office side of architecture and engineering. It is the result of many years' experience, only those methods being recommended that have survived the test of regular daily use. Among members of any profession there are always many who disdain to adopt some sort of system in the conduct of their business, and this is especially the case with the architectural profession, in which the anti-systematic art feeling exists to a large extent. Much, however, as it is desirable to work on a definite system it is possible to overdo the matter, thus stepping into the bounds of faddism. This is our complaint against the book under consideration. The author employs innumerable books. First, there are the diaries: the assistant records all he has done during the day; the principal has one diary for appointments and another for general professional work done; the draughtsman has a diary in which he enters what he has been doing every hour; there is an attendance diary, in which each member enters the exact hour of his arrival (though the time at which he leaves is not entered); a callers' book; and another engagements' book kept by the junior clerk. Letters next come under consideration. The author rightly emphasises the necessity for the stationery to be of good quality, and points out that if the writer's name is made unduly prominent followed by a long alphabetical display, the person to whom the letter is addressed may be led to conclude that the name is hardly sufficient to stand by itself, while "the absence of any such embellishment may be taken as an indication that the writer is, or believes he is, like the good wine which needs no bush." Should the name be omitted from the head of the note-paper, the writer is urged to refrain from making his signature an undecipherable cryptograph. All letters received are to be put in special marked baskets, numbered and entered in a letter register; then when replied to they are placed in another basket, and afterwards in a basket labelled "This Week's Letters." Files and cabinets are used, and a journal is kept in which requests and instructions in the letters are noted. The principal is to look over the envelopes to see that they are addressed properly, and all enclosures have attached to them a gummed label indicating the letter to which they belong. Finally, there are letter books and letter-despatch books. The same system applies to catalogues, which are not to be consigned to "some vile dusty place, unknown, unwrapped, unheeded and unsewn," but divided into sections and sub-sections, classified numerically, labelled, indexed and kept in presses and on shelves. After such an orderly discourse the author deals with specifications, drawings, estimates, certificates and reports, how they should be kept and prepared, concluding with chapters on cash-books and ledgers. Much useful information is supplied on these subjects, together with some excellent forms, but we feel that two many different books are employed, requiring too many entries to be made—so much so that in some cases it becomes almost ludicrous. This will perhaps be appreciated from the numerous books already referred to, but in addition there are several others not mentioned, such as the estate register, the sanitary register, the certificate book, the works book, the returnable documents register and the estate maps book. It is well to be systematic, but, as already pointed out, a system may be carried too far; and this is our feeling about this one in particular. Moreover, we think that the price of the book is double what it might have been considering its nature.

"Office Management: A Handbook for Architects and Civil Engineers." By W. Kaye Parry, London: E. & F. N. Spon, Ltd., 125, Strand. Price 10s. nett.

Deductions in Euclid.

This small book of deductions from propositions in Euclid, Books I. to IV., should prove of considerable use to students, teachers and others as a systematic summary of proofs of *a priori* propositions to those in Euclid, usually set as riders in the various text-books. It also serves a useful purpose in systematising the proofs of facts which are in every-day use by architects, engineers and draughtsmen in the applied sciences. We advise students of Euclid to use this book side by side with the ordinary text-books, for, being arranged in the same order, when a Euclidian proposition has been mastered this book can be taken up and all the subsidiary resultants followed out. The exercises or riders on Euclid at first are usually found by students very hard to master owing to their inability to clearly perceive the system of principles underlying the bare Euclidian propositions, and yet for the young brain these exercises are undoubtedly some of the finest stimulants and training to logical and coherent thought. What is now urgently needed is a book arranged upon a logical system for the solution of riders, giving hints upon methods of going to work and with numerous exercises. Then such a book as this by Mr. T. W. Edmondson will become enhanced in value as a book of answers to the problems.

"Deductions in Euclid." By T. W. Edmondson, M.A. 2s. 6d. London: W. B. Clive, 13, Booksellers' Row, Strand, W.C.

Calculations with Lead.

These tables of weights and measurements of sheet lead have been compiled for the use of lead rollers, plumbers, hardwaremen, builders, architects and measurers. They save considerable time in arriving at the estimated weight of a given length and breadth of sheet lead at so many pounds to the sq. ft. We need not enlarge upon their usefulness, which will be apparent to everyone. Like all of Messrs. Spon's handy-sized pocket note-books, this is got up in the very best style, having a neat leatherette cover and clear type.

"Weights and Measurements of Sheet Lead." By James Alexander. Price 1s. 6d. London: E. & F. N. Spon, Ltd., 125, Strand, W.C.

Engineering Notes.

A New County Bridge over the Derwent at Eddie Ford, in the parish of Muggleswick, was formally opened for the use of the public recently. The structure has taken the place of a footbridge and ford, which, especially in winter-time and after a heavy rain, were somewhat dangerous to cross. The new bridge has two segmental arches, with a span of 35ft. each, and is altogether 101ft. long and 25ft. high. The roadway is 15ft. in width. New approaches have been made to the extent of about 600ft., the old highway having been diverted. The cost is about £1,300. The contract was let to the late Mr. Thomas Westgarth, of Tow Law, and carried out under the supervision of Mr. Lowson Westgarth; Mr. J. E. Parker, of Blackhill and Newcastle, being the designer and engineer.

Power from Bubbles.—One of the most interesting devices by means of which natural water-power is rendered available for the use of man is the "Taylor System" of utilising the compressed air forced under the surface of a river by a cascade. The water is made to fall in such a way that the largest possible amount of air is drawn under, and the bubbles thus formed are trapped in chambers, whence their highly-compressed contents are distributed through pipes. The waste or "tail" race rises sufficiently near the level of the supply to sustain the pressure on the air chambers. This system of providing power has been in practical use in Magog, Province of Quebec, for more than a year, and a company has just been formed to utilise the waterfall of the Lachine Rapids for the benefit of Montreal.

The Largest Generating Station for Electric Power in Existence will be that which is to supply the New York Elevated Railway with electric traction—a great boon, by the way, to those coal-strewn avenues along which the elevated road at present runs. The normal capacity of the power station will be 65,000 horse-power, and the maximum capacity 100,000 horse-power. The steam plant will be made up of eight compound engines, which will be capable of running at a continuous productive capacity of 12,000 horse-power. It is, perhaps, interesting to observe that even these great engines are less in power than those which fill the engine-room of a great ocean liner. The "Deutschland's" quadruple-expansion engines, for instance, run at 18,000 horse-power. An electric train is already running along Second Avenue in New York. Like the trains of London prospective tubes, a motor will be attached to the front and the back of each train.

The New Weir at Windsor.—The picturesquely-situated weir which the Thames Conservancy has just completed between Romney Island and the Eton shore of the main river at Windsor is already proving a most useful factor in the controlling of the water in its district. The construction, which is perhaps the most remarkable feature on the Thames above Staines, is a novel piece of engineering, accomplished with no little difficulty under the personal supervision of Mr. Fenton, who has had charge of most of the conservancy work that has been carried out upon the river during the last few years. The central portion of the structure consists of a roofed gallery supported upon strong piles driven firmly into the bed of the stream. The cleverly-designed windlass can be easily run to and fro with the greatest ease whenever the massive iron panels are to be raised or lowered. During the recent drought the stream has been somewhat low, but by means of the new weir the water can be husbanded and kept as much as possible at "head" by drawing up the panels. In summer it was formerly somewhat risky for heavily-laden launches to approach the landing places at Thames side owing to the shallowness of the river and the possibility of their grounding or tilting. The new weir has, however, obviated this danger. The weir will also prove most serviceable in winter, as those in charge will be able to carry on their work easily in the roughest weather and quickly pass away the surplus water when the river is much flooded.

The Incorporated Association of Municipal and County Engineers held its annual conference at Leicester recently. Mr. E. G. Mawby, borough engineer for Leicester, who was elected president for the year, in his presidential address pointed out the great importance of having an adequate number of well-qualified building and sanitary inspectors as the best means of safeguarding the health of the community. He pointed out the danger in large towns of leaving in use defective and dangerous sewers of the worst type such as used to be laid before the days of their association. He had himself condemned 32 miles of such sewers in Leicester, and he was now carrying out a scheme to replace them at an estimated cost of £128,000. Certain experiments which he had submitted to the Local Government Board had resulted in that board sanctioning eight miles of a tributary sewerage scheme with ventilation by shafts without any surface grids whatever. The president described how the scheme of sewage disposal at Leicester, designed by the late Mr. Joseph Gordon, had proved so successful that the river Soar, which had been a black stream of offensive sewage matter, had been converted into a pure stream. He also described the three sets of baths provided by the Leicester Corporation, and added that they were about to add a fourth set at a cost of over £50,000. Mr. W. Howard Smith read a paper on the construction of permanent ways for electric tramways. Mr. Edward Manville (London) contributed a paper on the methods of safety for the overhead electric trolly system. Perhaps, he said, there was more liability to accident and more difficulty in guarding against it in connection with the trolly arm than with any other portion of the system. In the event of the trolly wheel becoming entangled it was difficult to prevent the trolly head being itself pulled off the trolly arm. For this reason the trolly arm should be long enough to carry the head free of the car, so that should it be dropped it would fall clear of the passengers. Electric shocks to passengers were exceedingly rare, and should not occur at all if the precaution was taken of thoroughly "earthing" all the metallic parts of the car, including the trolly standard itself.

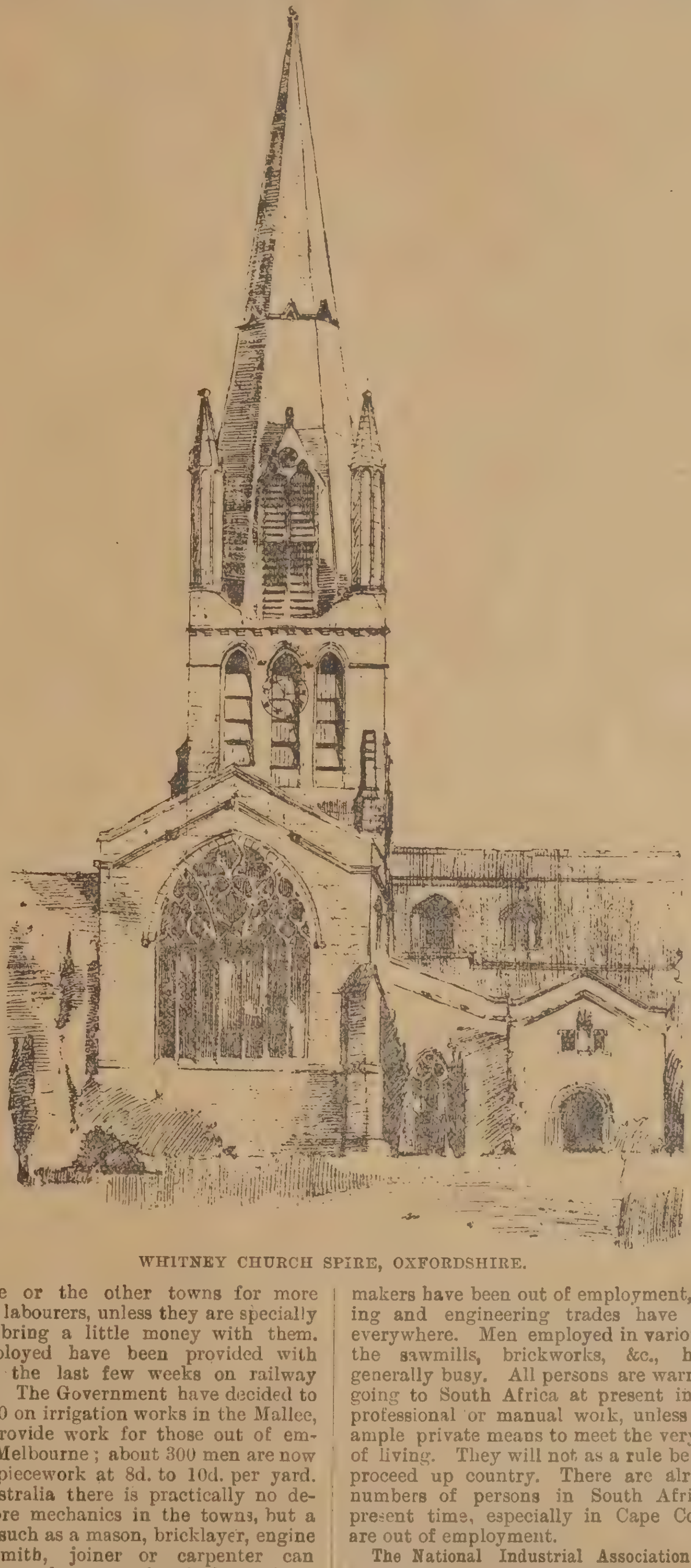
Masters and Men.

The Masons at Burton-on-Trent have struck work for an advance of 1d. per hour in wages. The present wages are 8½d.

The Scarborough Stonemasons' dispute has been settled. Early this year the operative stonemasons gave six months' notice to the Scarborough Master-builders' Association for an increase of wages from 8d. to 8½d. per hour and alterations in working rules. The Builders' Association considered the matter, but, taking into consideration the state of the building trade in Scarborough, they decided to offer the operative masons a reduction of ½d. per hour. An amicable arrangement has now been arrived at, the result being that the wages remain as at present, and certain modifications in the working rules have been made.

The Paviors in the employ of the Bradford Corporation have for some time past, through the Paviors' Union, been agitating for increased wages and for certain concessions with regard to their method of employment. They say that at present their pay works out at 7¾d. an hour, which is much below that paid in other towns where agitations have been successfully conducted. The Street and Drainage Committee of the Corporation have expressed themselves as being perfectly willing to receive a deputation of their own men, but they object to the presence of an official of the union, so that no interview has taken place. The men who are members of the union have now come out on strike. It should be said on their behalf that most of the paving work is let by the Corporation to subcontractors—old paviors who have been in the employ of the Corporation for many years. It is contended that the men's wage under this system is just what they choose to make it; in the summer months it would amount to more than 7¾d an hour. About fifty men will be concerned in the strike.

Labour in the Colonies.—The July circulars of the Emigrants' Information Office, whose address is 31, Broadway, Westminster, S.W., show the present prospects of emigration. This is the best season of the year for emigration to Canada. There is a fair demand for general labourers and for certain mechanics such as carpenters, blacksmiths and iron and steel workers, but not at St. John, New Brunswick, or at Winnipeg, Manitoba. Clerks and persons having no particular trade or calling, or otherwise unfit for manual labour, should not emigrate to Canada unless they have situations offered to them or have means of their own. In New South Wales a report from Sydney states that trade continues good, more especially for plumbers and builders, and the engineering trade has perhaps never been so busy. There is plenty of opening for good artizans in the engineering and general building trades, as well as for general handy men. In Victoria there is practically no demand in Melbourne or the other towns for more mechanics or labourers, unless they are specially skilled and bring a little money with them. Many unemployed have been provided with work during the last few weeks on railway construction. The Government have decided to spend £16,000 on irrigation works in the Mallee, which will provide work for those out of employment in Melbourne; about 300 men are now engaged on piecework at 8d. to 10d. per yard. In South Australia there is practically no demand for more mechanics in the towns, but a skilled hands such as a mason, bricklayer, engine fitter, blacksmith, joiner or carpenter can generally find employment after looking about for a little. Owing to drought and scarcity of employment emigrants are not recommended to go to Queensland at present unless they receive nominated passages or take a little money with them. In Western Australia, at Perth and Fremantle and Katanning there is a demand for mechanics in the building and other trades, good men getting constant employment at Perth; but elsewhere the supply is either sufficient, or, as at Coolgardie, in excess of the demand. At Jarrahdale there is a steady demand for sawmill hands and fellers. It is difficult for clerks, accountants, book-keepers and that class of labour to find employment anywhere. In Tasmania the supply of labour is, generally speaking, equal to the demand. In New Zealand, with the exception of a few places such as Dunedin, where some carpenters and boilermakers have been out of employment, the building and engineering trades have been busy everywhere. Men employed in various parts in the sawmills, brickworks, &c., have been generally busy. All persons are warned against going to South Africa at present in search of professional or manual work, unless they have ample private means to meet the very high cost of living. They will not as a rule be allowed to proceed up country. There are already large numbers of persons in South Africa at the present time, especially in Cape Colony, who are out of employment.



WHITNEY CHURCH SPIRE, OXFORDSHIRE.

The National Industrial Association has been formed to bring about an association of societies interested in trade questions, as employers, employed or as merchants; to keep before the minds of the employers and employed that the practical recognition of their common interest will strengthen and promote British trade and commerce; to enquire into and report on matters affecting British trade and commerce, with a view to enabling our manufacturers to hold their own in the markets of the world; and to create and cement between employers and employees a feeling of common interest: to provide an association where employers and employees can meet on all occasions on the same plane, and to create permanent machinery for conciliation which will be available in case of any threatened dispute between employers and their men. This association hopes to be able to act in perfect harmony with the federations or unions which may be in existence for the promotion of the interests of employers or employees; or with any boards of conciliation, or with any other associations or chambers which have for their object the promotion of trade and commerce. The *modus operandi* will be by instruction by the dissemination of suitable literature adapted to the education of the men for whom it is intended; the bringing of points of interest home to members of Parliament; the collection of matter from foreign Consuls, and the circulation of it in the proper quarters; the sending of joint deputations of employers and employees to the various markets of the world, with a view to discover in what way our trade with particular markets can be improved; the organisation of meetings of employers and employed in different trade centres, which should be addressed by speakers sent by the federation and the promotion of general discussion of subjects of commercial interest; to obtain the co-operation of chambers of commerce and mercantile associations throughout the country; judicious agitation in the press, and the re-printing and distribution of articles dealing with the subject. The association already has received support from numerous organisations and expressions of sympathy from eminent members of both Houses of Parliament and other gentlemen. Such an association would be most useful, and we hope that every large trade society in the building and engineering trades will join. Anyone desiring further information can obtain it from Mr. John Lockie at either of the following addresses: The Federation Offices, 124 and 125, Palace Chambers, Westminster, S.W.; 21, Dean Street, Newcastle on-Tyne; 8, 9 and 10, Great St. Helen's, E.C.; or Stonehall, Stonehouse, Devon.

Trade and Craft.

Bacterial Sewage Disposal.

We have received a copy of a new bacteria bed book from Messrs. Adams' Patent Sewage Lift Company, York, of which, whilst dealing especially with Mr. S. H. Adams' apparatus as applied to different systems, gives a very useful summary of the various types of bacterial disposal beds. The air-controlled feed apparatus is used in many different ways. The way in which the transmission of air to the interior of the apparatus causes an air-lock to shut off the supply, is not only unique but extremely simple and positive. With this feed a given amount of liquid may be delivered for a given time, or beds may shut off their own supply when full, and in each case feeds may be stopped and started in any desired sequence. The manufacturers have apparatus now in hand for weirs up to 5ft. in width. The timed overdraw siphon for discharging bacteria beds is helpful for use with "contact" beds, the length of contact being very readily determined when it is used. For simple beds, whether domestic or municipal, the alternating siphons are widely used. The storage of sewage and its discharge alternately to the beds not only ensures the delivery to the beds of sewage in a suitable form, but long periods of rest for recuperation. In all, the absence of moving parts has been made a *sine quâ non* with this apparatus. All the various operations are brought about by the simple application of natural laws—the pressure due to the liquid itself transferred through the medium of confined air to the apparatus to be controlled. Whilst the patent sewage lift is not specially dealt with in this useful catalogue, the application of this apparatus for automatic raising of sewage to bacteria beds is shown.

Keystones.

A New Parochial Room at Roundhay, in Lidgett Park Road, has been erected.

A Mortuary Chapel with a groined roof is to be erected at Hawarden Church, and will contain an altar tomb bearing the recumbent figures of Mr. and Mrs. Gladstone, for which Sir William Richmond has become responsible.

The Queen's Tower in Conway Castle is to be restored as a memorial to Queen Victoria. It is estimated that for about £200 the tower can be re-roofed, re-floored with oak and the windows re-glazed. By doing this a place will be provided to receive and store all local records, antiquities and curios.

In connection with the Church of St. James the Less, Bethnal Green, new buildings have been opened. They comprise clubrooms, gymnasia, dispensary, nurses' home, schools, rooms for cookery classes and other apartments. With the renovation of the church, vicarage and churchyard nearly £30,000 has been expended within the last four years.

Mr. Robert Wilson, architect to the School Board of Edinburgh, died last week. A native of Edinburgh, he was trained to his father's business, to which he succeeded after some preliminary experience in London. From his office have emanated the plans for the various schools erected from time to time under the Edinburgh School Board.

An Exhibition of Chinese Art will be opened towards the end of this month at the Whitechapel Art Gallery. It is to be the first of a series which will deal with the artistic and industrial productions of various nations, and will illustrate all kinds of national crafts. The director of the gallery is issuing in connection with this first exhibition an appeal for examples of Chinese art and for contributions towards the expenses.

The Architectural Association new Common Room has been opened to members at No. 56, Great Marlborough Street, W. The alterations have been carried out by Messrs. Shuffrey & Co., under the supervision of Mr. W. H. Seth-Smith, the president. The common room, offices and library will now be lighted by electric light. When the classes meet in October refreshments will be supplied, and members will be able to meet their friends and read the papers, professional or otherwise, during library hours. Stationery will be provided and smoking permitted.

A New Parish Church at Brockhampton is being erected on an eminence of the Home Farm near the new lodge, from plans by Mr. W. R. Lethaby, architect, of 2, Gray's Inn Square, London. The building is being erected of local stone only, namely, red sandstone from Caplar Quarry and greenstone from the Falcon, both of which are on the Brockhampton estate. A feature of the edifice will be the unusual thickness of its walls for a modern erection, namely, 3ft. It is intended to seat 135 worshippers (as against eighty in the old church), and is being built in the form of a cross. A lantern over the east end of the church will take the place of spire or tower, and the highest part of the building will not be more than 30ft. An oak belfry will be erected over the porch and the vestry will be under the chancel.

A New Fire Station for West Hampstead is being erected by the London County Council in West End Lane on land fronting the old village-green of West End. The site has cost £1,756 9s. 10d., and has an area of 16,000 sq. ft. The cost of the building will be about £11,373. The plans, which have been prepared by Mr. W. E. Riley, architect to the Council, contain several new features, such as the provision of an increased number of sets of quarters for the firemen and their families. Four of the sets of quarters will take the form of separate cottages, each with its own garden, at the rear of the station proper. Accommodation will be provided at the station itself for a steam fire-engine, horsed escape, and a hose pump, and there will also be a workshop, watch-house, recreation-room, stabling for four horses, and quarters for the station officer, five married firemen and two coachmen. The whole of the premises will be lighted by electricity.

A Monument of the "Maid of Orleans" has been erected at Mehun-sur-Yèvre. The statue is from the chisel of the Duchesse d'Uzès.

A New School at Vickerstown is being erected by the Barrow School Board to accommodate about 650 children. It is to be erected on the Central Hall principle, with classrooms adjoining. Mr. H. T. Fowler is the architect and Mr. Varley the contractor.

The Spanish Art Loan Exhibition at the Guildhall has been so popular that it has been decided, with the consent of the lenders of the works of art, to keep the exhibition open until August 28th, instead of closing it at the end of this month, as was at first arranged. The collection has been visited by over 200,000 persons.

A New Dispensary in Exmouth has been erected in Church Street. Standing in its own grounds, it contains vestibule, hall, waiting-room 22ft. by 15ft. consulting-room 15ft. by 14ft., dressing-room, dark-room, dispensary and caretaker's rooms. The building was designed by Mr. E. Ellis, and built by Mr. J. Lacy.

A New Congregational Church at Churchtown, Southport, has been opened recently. It has seating accommodation for about 750 persons, including the gallery which runs round three sides, the fourth side being occupied by endeavour room, minister's vestry, classroom, choir vestry and organ chamber. There are three entrances in the front and one at the side, and two staircases are provided for the gallery and a separate staircase for the choir. The seating and other woodwork is of pitch-pine and the roof is of an ornamental character. There is an octagonal tower on the south-west angle of the front, with a battlemented parapet, the principal elevation being in red pressed-brick with all the finishings to doors, windows, &c., in Cullingworth stone, finely tooled. A large four-light richly traceried window occupies the centra position, the work generally being of fifteenth-century character. The cost is about £2,800 and the architect is Mr. Francis P. Halsall A.R.I.B.A., of Southport.

Housing in London.—A conference betwee London County Councillors and Borough Councillors was held at the County Hall, Spring Gardens, S.W., recently on the Housing Question under the presidency of Mr. A. M. Torrance chairman of the London County Council. Mr D. Waterlow, chairman of the L.C.C. Housing Committees, said he was authorised to tell th conference that it would be ready to give to th Borough Councils all the benefit of its experience in the matter of building dwellings. Wit the County Council, the City Corporation an the twenty-eight borough councils all empowered to build under Part III. of the Housin Act some solution ought now to be found for th terrible housing evils under which London wa suffering. There was some danger that one o more authorities might compete for the sam piece of ground and thus force up the pric and he hoped as a result of their conferenc that a plan would be devised for avoiding th danger. In accordance with this suggestio several resolutions were passed, and the conference decided to meet again in the autumn.

Mr. William Vaughan has been appointed architect to the Bradford School Board from sixty four applicants. The position is a new o under the board. Owing to the accommodatio at the offices being already fully taxed, separa premises have been arranged for adjoining th building in Manor Row as the architect's offic Mr. Vaughan for nineteen years has been th chief architectural assistant to the Bradfor Corporation; and during that time has had larg experience in architectural work under Mr. Co He has been actively engaged upon the Car wright Memorial Hall, and amongst his rece designs may be mentioned the new baths West Bowling and the new gates in Bowl Park. The board of late have had a system holding competitions for work which has need the service of an architect, but the appointme of a permanent official to do the work is hop to turn out a means of reducing the expenditu For many years the architectural work und the board has been shared by Mr. E. P. Peters and Mr. C. H. Hargreaves, but neither of the gentlemen applied for the post allotted to M Vaughan.

A New Police Court and Station at Howden has been erected for the East Riding County Council at a cost of something like £4,000.

A New Mission Church at Wimbledon, dedicated to St. Peter, has been erected in Haydon Road, to seat 300. It is a chapel-of-ease in connection with All Saints' Church.

A New Church at South Lynn, dedicated to St. Michael and All Angels, has been erected near the railway station at a cost of £1,500. Schools have also cost another £800. Mr. L. F. Eagleton was the architect and Mr. R. Dye, the builder.

A New Hospital at Bristol is being erected for the Kingswood district. The site, of about four acres, stands on one of the highest points in the neighbourhood, and is nearly 370ft. above sea-level. Mr. A. J. Saise (surveyor) is the architect. The new hospital will have a south-west aspect and accommodation will be provided for about fifty cases.

A New Church at Cape Hill, Smethwick, dedicated to St. Chad has been erected. The style of the building, which has been erected in red brick with stone dressings, at a cost of £5,000, is a plain treatment of Early English Gothic, and accommodation is provided for 600 persons. The nave is 80ft. long and 24ft. wide, and divided from the aisles by arcades each of five arches. The chancel is 30ft. by 24ft. feet. Clergy and choir vestries are provided, as well as a large organ-chamber. The main entrance of the church is from a porch on the north side, near the corner of Edith and Shireland Roads. The interior of the building is faced with red brick dadoes and quoins to all windows, the remaining portion of the walls being plastered. The roof is open timbered, of pitch-pine and red deal; the windows have been glazed with leaded lights, and the heating of the building will be by the low-pressure system. The edifice is lighted from ornamental wrought-iron coronas, suspended from the nave arcading. Messrs. J. Harley & Son have carried out the work from designs by Mr. F. G. Gill.

EXAMINATIONS AT THE ECOLE DES BEAUX-ARTS.

THE WAYS OF THE STUDENTS.

THE spring entrance examinations of the Ecole des Beaux-Arts are unlike any others outside of Paris. For six months previously the ateliers or studios are filled with men preparing for these examinations. Early on the chosen day the streets in the Quarter are filled with men carrying drawing boards and other utensils, and when at eight o'clock the gates of the Ecole are thrown open hundreds of young men file in, shouting at the top of their voices. As his name is called each goes past the guard and up the stairs to the little rooms, or *loges*, to secure a place in which to do his work. These *loges* are about 10ft. by 12ft. each and hold six men comfortably. They are by no means ideal working-rooms, being dirty and ill-lighted, and opening off a long narrow passage: altogether they are about as uninspiring as one can imagine.

To the average person the idea of an examination suggests an ordinary room, presided over by a dignified professor with the utmost quiet prevailing, so that one can almost hear the scratch of the pencil. Who can picture an examination held while hundreds of men are singing, whistling or yelling and running up and down a passage? Yet this is just what happens at the Beaux-Arts when the men are making the sketches of a given subject (required to be completed in twelve hours) which determine whether or not they shall enter the greatest architectural school in the world.

The uproar is constant, the noise deafening. From the moment the men assemble in the court till the last one leaves the school at night this noise is constant. First one set and then another takes it up. One wonders that any work can be done.

At the last examination there were no professors in sight, only guardians, whose principal occupation seemed to be to sell food and drink to the students and afterwards to dispose of the beer and wine that were left. As a result, at about four o'clock the guardians, who were supposed to see that the men did not make use of books or photographs, were assembled in one of the vacant rooms discussing politics and drinking and adding to the noise made by the students.

But notwithstanding all the apparent drawbacks the drawings were being made. After studying all the morning on the schemes, most of the men would eat and then start on the finished sketches. As time went on and darkness set in out came candles, for there is no gas or electric light in the rooms; and about six o'clock some of the men handed in their finished work. Others, a little pressed for time, would be working with a will to finish before it was too late. When a party of visitors make their appearance at the door of this *loge* the busy one would call out "*Charette!*" And this would be respected, for it means, "I am in a hurry; need all my time. Don't bother me." At eight the guardians collected the drawings, most of which were completed. Then the men went out, still shouting.

On Sunday the professors went over all the drawings and marked them. On Monday afternoon the results were announced. As early as 4 p.m. hundreds of men assembled in the court of the Ecole to wait until the doors were opened at seven. If noise prevailed before, it was nothing compared with that which now was heard. With nothing to do but wait, and with every nerve strained in expectation, it is perhaps excusable if the 500 young men let themselves loose.

Finally the doors of the great hall were thrown open and the men crowded in. The noise was stilled in an instant, and one could almost have heard a pin drop as the names of the men and the marks they received were called out. Thus the examination was conducted.

New Companies.

Gerrard & Sons, Ltd.

Registered June 22nd to acquire the business carried on by J. Gerrard, T. L. Gerrard, S. Gerrard and J. A. Gerrard, at Swinton, Lancashire, as J. Gerrard & Sons, and the business of a builder carried on by William Richardson at Swinton, and to carry on the business of land and estate owners, builders, contractors, joiners, masons, decorators, shopfitters, undertakers, builders' merchants, sawmill proprietors, house agents, financiers, &c. Capital £30,000 in £1 shares. The first directors are J. Gerrard, T. L. Gerrard, S. Gerrard, J. A. Gerrard and W. Richardson.

Wire-Wove Wood Co., Ltd.

Registered June 24th to carry on the business of manufacturers of and dealers in wooden, metal or textile mats, matting, parquetry, carpets, linoleum, oilcloth, and wooden, metal or other pavements, makers of blinds and shutters, cabinet-makers, stonemasons, engineers, contractors, &c. Capital £5,000 in £1 shares.

J. F. Elton & Co., Ltd.

Registered June 25th to adopt an agreement with S. F. Dean for the acquisition of the business carried on by him at Archer Works, 80, Liverpool Road, Stoke-on-Trent, as J. F. Elton & Co., and to carry on the business of dealers in, agents for and manufacturers of china, earthenware, glass, pottery, terra-cotta, coloured, glazed or other bricks and tiles, &c. Capital £3,000 in £1 shares. The first directors are J F. Elton, A. Sherratt and J. E. Brunt. Registered office: Archer Works, 80, Liverpool Road, Stoke-on-Trent.

Decorators' Supply Co., Ltd.

Registered June 25th to acquire the business of paper-hanging merchants, oil and colour men, &c., carried on by F. Deecker, at 20–22, Tulketh Street, Southport, and 178, Lytham Road, Blackpool, as the Decorators' Supply Company, and to carry on the said business. Capital £5,000 in £1 shares (1,250 preference).

Snaith Plaster and Cement Co., Ltd.

Registered June 26th to acquire the business carried on at Cropwell Bishop, Nottinghamshire, as the Cropwell Plaster and Cement Company, and to manufacture and deal in plaster-of-Paris, cement, plaster, bricks, pipes, tiles, paper and other substances made from clay, earth, gypsum, iron, ironstone, &c. Capital £10,000 in £1 shares. The first directors are E. Gerrish and D. W. Snaith. Registered office: 41, Church Street, Birmingham.

Patent Weather-proof Window Co., Ltd.

Registered June 26th to acquire the patents of James Boardall for a new or improved weather-bar for windows and for improvements in sashes, and to carry on the business of glass and other window manufacturers, &c. Capital £1,000 in £1 shares. Registered office: 8, Old Bank Chambers, Bradford, Yorkshire.

Jesse Tildesley, Ltd.

Registered June 26th to acquire the business carried on by Jesse Tildesley at Willenhall, Staffordshire, and elsewhere; to adopt an agreement with F. T. Tildesley, T. P. Wood and S. J. Wood, and to carry on the business of manufacturers of iron and steel bridges, viaducts, girders, roofs, buildings, boilers, gasholders, tanks, doors, rooms and all kinds of engineering and constructional iron and steelwork. Capital £30,000 in £10 shares. The first directors are F. T. Tildesley, T. P. Wood and S. J. Wood.

International Wall Paper Co., Ltd.

Registered June 27th to adopt an agreement with N. T. Beard and to carry on the business of wall paper manufacturers, designers and dealers, and manufacturers of wall hangings of every description, builders, house decorators and contractors, &c. Capital £30,000 in £1 shares. Registered office: 25, Victoria Street, S.W.

Elliott Bros., Ltd.

Registered June 25th, to acquire the business carried on by F. H. Elliott and W. P. Elliott as Elliott Bros. at Southampton and Beaulieu, and to carry on the business of cement, lime, coal and brick merchants, carpenters, joiners, timber merchants, sawmill proprietors, ironmongers, builders, contractors, &c. Capital £20,000 in £1 shares. The first directors are F. H. Elliott, W. P. Elliott, F. E. E. Elliott and A. W. Pearce. Registered office: Millbank Wharf, Millbank Street, Northam, Southampton.

Morgans (Birmingham), Ltd.

Registered June 28th to adopt an agreement with John Morgan to carry on the business of timber merchants and sawmill proprietors. to deal in timber and wood of all kinds, and to carry on the business of general merchants, carriers, &c. Capital £1,000 in £1 shares.

Standard Range and Foundry Co., Ltd.

Registered June 29th to acquire and carry on the business of a hardware and oil and colour merchant carried on by J. A. Pratt at the Central Hardware Stores, Watford, and elsewhere. Capital £10.000 in £1 shares. Registered office: Central Hardware Stores, Watford, Hertfordshire.

Barnsley Brick and Tile Co., Ltd.

Registered June 29th to acquire land and buildings in Yorkshire or elsewhere, and to carry on the business of land, mine, quarry and brickyard owners, brick, tile, terra-cotta and earthenware manufacturers, builders, contractors, lime, stone, sand and brick merchants, &c. Capital £6,000 in £1 shares. The first directors are C. Wray, H. Owram, W. Foulstone, W. G. England and W. Dunk.

Lloyd's Milton Brick Co., Ltd.

Registered June 29th to carry on the business of brick, tile, pottery, pipe, slate, brick and stoneware manufacturers, clayworkers, cement, lime and terra-cotta manufacturers, &c. Capital £10,000 in £1 shares (8,000 five per cent. cumulative preference). The first directors are T. Lloyd and A. Youngman.

COMING EVENTS.

Tuesday, July 9, to Friday, July 12.

BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.—Annual Meeting at Birkenhead. Inaugural Address by the President, Mr. W. A. Richardson, M.I.C.E. Mr. William Ingham, A.M.I.C.E., on "The Design, Construction and Cost of Service Reservoirs." Mr. William Watts on "The Pollution of Public Water Supplies." Mr. A. G. Cloake on "French Practice in the Manufacture of Cast Iron Pipes." Mr. William E. Plummer, M.A., F.R.A.S., on "Rainfall, the Cycle of Precipitation." Visits to various works in the neighbourhood,

Wednesday, July 10.

INSTITUTE OF SANITARY ENGINEERS.—Meeting of the General Purposes and Finance Committee, at 4 p.m.

Saturday, July 13.

ARCHITECTURAL ASSOCIATION.—Third Summer Visit to Medmenham Abbey, &c., and "Danesfield," both at Great Marlow, by permission of the Architect, Mr. W. H. Romaine-Walker.

Thursday, July 18.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Annual Congress begins at Newcastle-on-Tyne.

Saturday, July 20.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS, Newcastle-on-Tyne.—Council meeting at 1.30 p.m.

Monday, July 22, to Saturday, July 27.

ARCHITECTURAL ASSOCIATION.—Annual Excursion.

Wednesday, July 24.

ROYAL INSTITUTE OF PUBLIC HEALTH.—Annual Dinner at the Whitehall Rooms. Presentation of Harben Gold Medal to Professor R. Koch, of Berlin.

Thursday, July 25.

ROYAL INSTITUTE OF PUBLIC HEALTH.—Congress opens at Eastbourne.

Saturday, July 27.

SOCIETY OF ARCHITECTS.—Summer Excursion to Oxford.

CONTRACTS OPEN.

COUNTY OF SOUTHAMPTON.

TO BUILDERS.

NEW POLICE STATION AT WOOLSTON.

Persons desirous of TENDERING for the ERECTION of NEW POLICE STATION at Woolston may see plans and specifications and obtain bills of quantities and all other information at the office of Mr. W. J. TAYLOR, County Surveyor, the Castle, Winchester, on and after MONDAY, 8th July, 1901, between the hours of NINE a.m. and FIVE p.m., Saturdays NINE a.m. and ONE p.m.

A deposit of five guineas will be required for the bill of quantities, and will be refunded on receipt of a bonâ-fide tender.

Tenders, endorsed "Police Station, Woolston," to be on forms supplied by the County Surveyor, and to be delivered to me on or before SATURDAY, 20th JULY, 1901.

The County Council do not bind themselves to accept the lowest or any Tender. (Signed) H. BARBER,
Clerk of the County Council.

The Castle, Winchester.

COMPLETE LIST OF CONTRACTS OPEN.

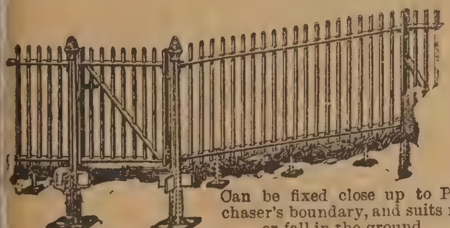
DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
July 12	Pennan, Aberdeenshire—Coastguard Buildings	—	Director of Works Department, Pennan.
„ 13	Little Bolas—Abutment and Wing Walls	—	A. T. Davis, Shirehall, Shrewsbury.
„ 13	Hellesden, nr. Norwich—Additions to City Asylums	Norwich Corporation	A. E. Collins, City Engineer, Guildhall, Norwich.
„ 13	Auldearn, Scotland—Cottages	—	J. Grigor, Carpenter, Auldearn.
„ 13	Chester—Shedding, &c.	Agricultural Society	T. A. Beckett, Secretary, St. Werburgh's Chambers, Chester.
„ 13	Church Coppenhall, Cheshire—Cloakroom Accommdn.	School Board	J. A. Atkinson, 18, Hightown, Crewe.
„ 13	Finsthwaite—Dwelling House	Misses Coward	J. Coward, Stott Park Mill, Lake Side, Finsthwaite.
„ 13	Greetland, Halifax—House	—	J. F. Walsh & G. Nicholas, Lancs and Yorks Bank Chbrs., Halifax.
„ 13	Halifax—Villa Residence	—	G. Buckley & Son, Architects, Tower Chambers, Halifax.
„ 13	Hexham—Public Slaughter-Houses	Urban District Council	R. T. Surtees, Surveyor, Hexham.
„ 13	Rhymney, Wales—Two Villas	Rev. R. E. Peregrine and W. D. Thomas	J. L. Smith & Davies, 50 High Street, Merthyr Tydfil.
„ 13	Sale, Cheshire—Additions to Technical School	Urban District Council	W. Holt, Engineer, Council Offices, Sale.
„ 13	Warminster, Wilts—Cottage	W. F. Morgan	W. H. Hardick, Architect, High Street, Warminster.
„ 15	Erith, Kent—Electric Light Station Works	Urban District Council	W. Egerton, 12 Queen's Road, Erith.
„ 15	Trealaw, Wales—Twenty Cottages	Ynyscynon Building Club	Mr. Lewis, 14 Sherwood Place, Llwynypia.
„ 15	York—Brick Wall	Lunatic Asylum Governors	Demaine & Brierley, Architects, Lendal, York.
„ 15	Slateford, Edinburgh—New Laundry	Caledonian Railway Company	Company's Engineer, Buchanan Street Station, Glasgow.
„ 15	Leeds—Underground Conveniences	Market Committee	City Engineer's Office, Municipal Buildings, Leeds.
„ 15	Leeds—New Premises	West Riding Union Banking Co., Ltd.	Oliver & Dodgshun, Architects, Park Square, Leeds.
„ 15	Macclesfield—Epileptic Ward & Nurses' Home at Asylum	Chester County Council	H. Bestwick, County Architect, Newgate Street, Chester.
„ 16	London, E.—Two blocks of Workmen's Dwellings	London County Council	Architect's Department, Housing of the Working Classes Branch, 18 Pall Mall East, S.W.
„ 16	Kingston-on-Thames—Addition to Nurses' Home	Union Guardians	W. H. Hope, Architect, Hampton Wick.
„ 16	Bury, Lancs—Retaining Wall	Sewering and Paving Committee	A. W. Bradley, Borough Engineer, Bank Street, Bury, Lancs.
„ 16	Gulval, Cornwall—Cloakroom, &c., at School	School Board	T. H. Cornish, 8 Parade Street, Penzance.
„ 17	London, S.W.—Repairs, &c., to Infirmary	St. George's Union Guardians	E. T. Hall, 54 Bedford Square, W.C.
„ 17	Leeds—Hospital Extension	Sanitary Committee	E. T. Hall, 54 Bedford Square, W.C.
„ 18	Wimbledon—Conveniences	Urban District Council	Council Offices, The Broadway, Wimbledon.
„ 18	Swindon—Pupil Teachers' Centre and School	School Board	W. Seaton, Clerk, Town Hall, Swindon.
„ 18	Atherton, Lancs—Public Baths	Urban District Council	F. H. Grimshaw, Surveyor to Council, Atherton, Manchester.
„ 20	Crumlin—House	—	R. L. Roberts, Architect, Abercarn.
„ 20	Woolston, Hants—Police Station	—	W. J. Taylor, County Surveyor, The Castle, Winchester.
„ 20	Oakley—Schools	Brill Managers	F. Taylor, 26 Temple Street, Aylesbury.
„ 20	Cymle, Neath—Rebuilding Public-house	E. E. Bevan	J. C. Rees, Architect, Neath.
„ 21	Kenchester, Hereford—Widening Culvert	Rural District Council	T. Llanwarne, 6 St. John Street, Hereford.
„ 22	Caterham, Surrey—Additions to Laundry, &c.	Metropolitan Asylums Board	T. D. Mann, Board's Offices, Embankment, E.C.
„ 22	Blackburn—Electricity Works	Electricity Committee	A. S. Giles, Borough Electrical Engineer, Jubilee St., Blackburn.
„ 22	Sheffield—Sandhouse, Brassfoundry, &c.	Tramways Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
„ 23	Broadway, near Sheffield—School and Offices	Norton School Board	J. Norton, Architect, Alliance Chambers, George Street, Sheffield.
„ 24	London, E.—Medical Officers' Residence, &c.	Poplar Union Guardians	J. & S. F. Clarkson, 136 High Street, Poplar, E.
„ 27	Brixham—Police Station	Devon Standing Joint Committee	E. H. Harbottle, County Surveyor, Exeter.
„ 27	Newton Abbot—Addition to Police Station	Devon Standing Joint Committee	E. H. Harbottle, County Surveyor, Exeter.
„ 27	Ramsey, I.M.—Business Premises	—	J. T. Boyde, Architect, Ramsey.
„ 29	Glasgow—Substruction of Central Station Extension	Caledonian Railway Company	Engineer, Buchanan Street Station, Glasgow.
„ 30	Cannock—Infirmary of Workhouse	Union Guardians	A. Veall, 84 Darlington Street, Wolverhampton.
Aug. 1	Chester—Asylum Board	Committee of Visitors	H. Beswick, County Architect, Newgate Street, Chester.
„ 5	Newport, I.W.—Library, Technical Institute, &c.	County Council	Newman, F., County Surveyor, St. Thomas Street, Ryde.
Sept. 16	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
	ENGINEERING:		
July 12	Chesterfield—Waterworks	Rural District Council	J. Frith, Engineer to Council, Baslow, via Chesterfield.
„ 12	Mansfield—Electrical Plant	Corporation	R. Hammond, 64 Victoria Street, S.W.
„ 13	Chorley, Lancs—Pumping Station	Rural District Council	A. Jolly, 9 High Street, Chorley.
„ 13	Fisherton Anger & Bremerton, Salisbury—Sinking Well	Waterworks Company	S. B. Smith, Solicitor, Crown Chambers, Salisbury.
„ 13	Christchurch, Hants—Reconstruction of Bridge	County Council	W. J. Taylor, County Surveyor, The Castle, Winchester.
„ 13	Gwaun-cae-Gurwen, Wales—Driving Heading	—	Mr. Powell, Gwaun-cae-Gurwen.
„ 15	Bangor, Ireland—Gas Plant	Urban District Council	T. Morgan, Town Clerk, Bangor, Ireland.
„ 15	Roxburgh, Scotland—Boilers, &c.	Lunacy Board	Bertrams, Ltd., Engnrs., St. Katharine's Wks., Sciennes, Edinburgh.
„ 15	London, E.C.—Ten Locomotives	Bengal-Nagpur Railway Co., Ltd.	Sir J. Wolfe Barry, 21 Delahay Street, Westminster.
„ 16	Birkenhead—Electric Tramcar Bodies, &c.	Corporation	A. R. Fearnley, Manager, Sessions House, Brandon St., Birkenhead.
„ 16	Bury, Lancs—Pumping Station	Water Board	J. Cartwright, Engineer, Peel Chambers, Market Place, Bury.
„ 16	Ashton-under-Lyne—Washing Machines, &c.	Workhouse Guardians	T. Williams, Clerk, Union Offices, Ashton-under-Lyne.
„ 16	Dover—Water Mains	Town Council	H. E. Stilgoe, Borough Engineer, Town Hall, Dover.
„ 16	Kingston-on-Thames—Wrought-iron & Steel Balconies	Workhouse Guardians	W. H. Hope, Architect, Hampton Wick.
„ 17	Lowestoft—Sea Wall	Town Council	W. T. Douglas, 15 Victoria Street, Westminster, S.W.
„ 18	Shrewsbury—Waterworks	Corporation	J. Taylor, Sons & S. Crimp, 27 Great George Street, Westminster.
„ 18	Egremont, Cheshire—Machinery and Tools	Wallasey Urban District Council	J. H. Crowther, Engineer, Great Float, near Birkenhead.
„ 18	London, E.—Electrical Plant, &c.	Stepney Borough Council	A. Wright, 27 Osburn Street, E.
„ 19	Buckingham—Water Supply Works	Rural District Council	G. Roberts, Engineer, Deanshanger, Stony Stratford.
„ 20	Kirkcaldy—Electrical Feeders, &c.	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
„ 22	Southall—Water Tower	South West Suburban Water Company	R. S. G. Moore, 17 Victoria Street, S.W.
„ 23	Wellingborough—Waterworks	Urban District Council	E. Sharman, Surveyor, Market Square, Wellingborough.
„ 24	Madrid—Cranes	Committee of the Port Works at Corunna	Commercial Department, Foreign Office, S.W.
„ 31	Heanor—Boilers, Pumps, &c., at Waterworks	Urban District Council	J. Holbrook, Surveyor, Heanor.
„ 29	Glasgow—Caisson Gate	Caledonian Railway Company	Sir J. W. Barry, 21 Delahay Street, Westminster.
„ 29	Grangemouth, Scotland—Steel Swing Bridge	Caledonian Railway Company	Sir J. W. Barry, 21 Delahay Street, Westminster.
Aug. 1	Manila—Harbour	—	Commercial Department, Foreign Office, Manila.
„ 5	Brecon—Electric Lighting	Asylum Committee	Giles, Gough & Trollope, 28 Craven Street, Strand, W.C.
	IRON AND STEEL:		
July 12	Manchester—Nails, Bolts, &c.	Ship Canal Co.	Stores Department, Manchester Docks, Trafford Road, Salford.
„ 15	Barton Mills, Suffolk—Iron Top to Bridge	West Suffolk County Council	A. A. Hunt, County Surveyor, Sudbury.
„ 16	London, E.C.—Steel Plates, Engine Tyres, &c.	South Indian Railway Co.	Company's Offices, 55 Gracechurch Street, E.C.
„ 17	London, E.C.—Iron and Steel Work for Overbridge	East Indian Railway Co.	C. W. Young, Secretary, Offices, Nicholas Lane, E.C.
„ 18	Leeds—Castings	Sewerage Committee	City Engineer, Municipal Buildings, Leeds.
„ 31	Amsterdam—Railway Stores	Netherlands Ministry for the Colonies	M. Nyhoff, Bookseller, The Hague.
„ 31	Sydney, N.S.W.—Rails	—	Agent-General for N.S.W., 9 Victoria Street, Westminster, S.W.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		PAINTING AND PLUMBING:		
July	12	Cork—Painting Works at the Hospital..	Joint Committee of Management ..	House Surgeon, Hospital, Cork.
,,	12	Hull—Painting at Technical School	Technical Instruction Committee	J. H. Hirst, City Architect, Town Hall, Hull.
,,	12	Manchester—Sheet Lead, Brushes, &c.	Ship Canal Co.	Stores Department, Manchester Docks, Trafford Road, Salford.
,,	13	Bristol—Painting, &c., at Schools..	School Board ..	W. A. Adams, Clerk, Guildhall, Bristol.
,,	13	York—Painting	Corporation	A. Creer, City Engineer, Guildhall, York.
,,	15	London, E.C.—Repainting Tower Bridge	Corporation	City Surveyor, Guildhall, E.C.
,,	15	Skenfrith, Abergavenny—Painting, &c., School	School Board ..	J. H. Farquhar, Clerk, Abergavenny.
,,	16	London, E.C.—Oils and Colours	South Indian Railway Company	Company's Offices, 55 Gracechurch Street, E.C.
,,	16	Ipswich—Painting and Decorating Works, &c.	School Board ..	J. H. Hume, Clerk, Tower House, Tower Street, Ipswich.
,,	16	Leeds—Painting at Workhouse	Union Guardians	J. H. Ford, Clerk, Poor Law Offices, South Parade, Leeds.
,,	18	Croydon—Painting, &c.	Town Council ..	Deputy Borough Engineer, Town Hall, Croydon.
,,	18	Styal, Handforth, near Manchester—Painting, &c.	Chorlton Union Guardians ..	Porter, Union Offices, Styal.
,,	18	Wakefield—Painting, Colouring, &c.	Corporation	City Surveyor, Town Hall, Wakefield.
,,	20	Castleford—Painting Methodist Free Church ..	——	H. Fawbert, Corner, Powell Street, Castleford.
Aug.	5	Cleckheaton—Interior Renovation of Church ..	——	Wesleyan Church, Whitcliffe Road, Cleckheaton.
		ROADS AND CARTAGE:		
July	12	Croydon—Portland Cement..	Corporation Tramways	Borough Road Surveyor, Town Hall, Croydon.
,,	12	Yardley, near Birmingham—Kerbing, &c.	Rural District Council	A. W. Smith, 460 Stratford Road, Sparkhill, Birmingham.
,,	13	Braintree, Essex—Granite ..	Urban District Council	H. H. Nankwell, Surveyor, Vestry Hall, Braintree.
,,	13	London, E.—Road Works, &c.	Stepney Borough Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
,,	14	Garston, Lancs—Road Works	Urban District Council	F. W. Bowden, Surveyor, Public Offices, Grassendale.
,,	15	Bedford—Granite	Corporation	T. S. Porter, Town Clerk, Bedford.
,,	15	Erith, Kent—Street Works ..	Urban District Council	Surveyor to Council, High Street, Erith.
,,	15	Hemel Hempstead—Kerbing, Paving, &c.	Hertfordshire County Council	U. A. Smith, 41 Parliament Street, Westminster.
,,	16	Epping, Essex—Making-up..	Urban District Council	G. J. Creed, Clerk, Epping.
,,	17	Winsford—Stone	Urban District Council	H. Hulse, Surveyor, Winsford.
,,	22	Stevenage, Herts—Granite ..	Urban District Council	W. O. Times, Clerk, Council Offices, Stevenage.
,,	22	Dover—Street Improvements	Town Council ..	H. E. Stilgoe, Borough Engineer, Town Hall, Dover.
,,	28	Lochgelly, Scotland—Granolithic Paving	Town Council ..	W. Birrell, 200 High Street, Kirkcaldy.
		SANITARY:		
July	12	Rattery, Devon—Drainage Works	Totnes Rural District Council	C. Ellis, Highway Surveyor, Buckfastleigh.
,,	13	Wheatley, Oxon—Sewers, &c.	Urban District Council	G. Whinship, 21 St. Michael's Street, Oxford.
,,	15	London, W.—Barging Refuse, &c.	Kensington Borough Council	W. Weaver, Borough Engineer, Town Hall, Kensington.
,,	15	Northwich—Sewering	Urban District Council	H. Bancroft & Son, 8 Mosley Street, Manchester.
,,	15	Cockfield, Durham—Stoneware Pipe Sewer	Barnard Castle Rural District Council	F. H. Livesay, 107 Newgate Street, Bishop Auckland.
,,	15	Cowdenheath, Scotland—Drainage Works	Police Commissioners	Buchanan & Bennett, 12 High Street, Edinburgh.
,,	15	London, N.—Stoneware Pipe Sewer	Hornsey Urban District Council ..	E. J. Lovegrove, 99 Southwood Lane, Highgate, N.
,,	15	Newtown Linford, Leics—Sewerage Works	Barrow-on-Soar Rural District Council ..	F. Griffith, Waterworks Office, Bowling Green Street, Leicester.
,,	16	Godstone—Sewerage Works	Rural District Council	Fairbank & Son, 13 Lendal, York.
,,	16	Heywood, Lancs—Lime, &c.	Gas Committee	W. Whatmough, Gas Manager, Municipal Buildings, Heywood.
,,	18	Leeds—Earthenware Pipes, &c.	Sewerage Committee ..	City Engineer, Municipal Buildings, Leeds.
,,	20	Bridlington—Sewers, &c.	Town Council ..	E. R. Matthews, Town Hall, Bridlington.
,,	22	Basford, Notts—Removal of Night Soil (two contracts)	Rural District Council	C. J. Spencer, Clerk, Public Offices, Basford, Nottingham.
,,	24	Lyme Regis, Dorset—Sewers	Town Council ..	M. C. Preston, Town Clerk, Lyme Regis.
Aug.	1	Stroud—Sewage Disposal Works ..	Rural District Council	F. Winterbottom, Clerk, John Street, Stroud.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
July	13	Bexhill—Cemetery Chapel ..	£10	Surveyor, Town Hall, Bexhill.
,,	31	Manchester—Fire Station and Police Station	£300, £200 and £100	W. H. Talbot, Town Hall, Manchester.
Aug.	1	Egremont, Cumbrld.—Alteration of Property in Main St.	——	J. Lowery, 59 Main Street, Egremont.
,,	31	Sheffield—Alteration of Ecclesall Church	——	Rev. T. Houghton, Ecclesall Vicarage, Sheffield.
Oct.	1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.



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ILLUSTRATED CATALOGUE OF ALL KINDS OF HURDLES, FENCING, GATES, &c. FREE.

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ROOFING SLATES:

Velinheli, Penrhyn, and Westmoreland.

SLATE SLAB GOODS:

Both Plain and Enamelled.

ALFRED CARTER & CO., LIVERPOOL.

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Admits clean diffused air, absolutely without draught.

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Noiseless—no loose parts to rattle.

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Estd. 1832.

VOL. VIII.

ARCHITECTURAL REVIEW.

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CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 9 0	—
Clover, best	per load	4 5 0	5 2 6
Hay, best	do.	4 10 0	5 0 0
Sainfoin mixture ..	do.	4 0 0	4 17 6
Straw	do.	1 8 0	1 16 0

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ..	per cwt.	1 8 0	1 8 7
Colza Oil, English ..	do.	1 7 0	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 4 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do.	1 0 4½	—
Linseed Oil, barrels ..	do.	1 12 3	—
Petroleum, American ..	per gal.	0 0 5¾	0 0 5⅞
Do. Russian ..	do.	0 0 4⅞	0 0 5
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	3 1 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 5 0	1 6 0
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	1 6 10½	1 7 0

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ..	per ton	85 0 0	—
Iron, Staffs., bar ..	do.	6 5 0	8 10 0
Do. Galvanised Corrugated sheet ..	do.	11 10 0	—
Lead, pig, Spanish ..	do.	12 6 3	12 7 6
Do. do. English common brands	do.	12 17 6	—
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17 9 0	—
Do. pipe	do.	18 3 0	—
Nails, cut clasp, 3in. to 6in.	do.	12 0 0	13 0 0
Do. floor brads	do.	11 15 0	12 15 0
Steel, Staffs., Girders and Angles	do.	6 0 0	6 5 0
Do. Mild Bars	do.	7 0 0	7 10 0
Tin, Foreign	do.	129 5 0	129 15 0
Do. English ingots ..	do.	130 10 0	—
Zinc, sheets, Silesian ..	do.	22 0 0	—
Do. do. Vieille Montaigne	do.	22 10 0	—
Do. Spelter	do.	16 12 6	17 2 6

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel ..	per load	3 0 0	4 0 0
Pine, Quebec Yellow ..	do.	4 7 6	6 0 0
Pine, Pitch	per load	2 9 0	3 0 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 0
Do. Petersburg ..	per bundle	0 0 9	0 0 10½
Deals, Archangel 2nd & 1st	per P.Std.	8 5 0	11 15 0
Do. do. 4th & 3rd	do.	8 0 0	—
Do. do. unsorted	do.	—	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	21 0 0	—
Do. do. 2nd "	do.	19 0 0	—
Do. do. unsorted	do.	11 0 0	—
Do. do. White	do.	9 10 0	11 5 0
Do. Swedish	do.	9 10 0	18 0 0
Do. White Sea ..	do.	9 15 0	13 0 0
Do. Quebec Pine, 1st ..	do.	22 0 0	23 0 0
Do. do. 2nd ..	do.	19 15 0	—
Do. do. 3rd &c.	do.	13 10 0	—
Do. Canadian Spruce, 1st	do.	12 5 0	—
Do. do. 3rd & 2nd	do.	9 5 0	10 0 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds ..	do.	6 0 0	9 0 0
Flooring Boards, 1in. prepared, 1st ..	per square	0 11 6	0 13 6
Do. 2nd ..	do.	0 9 6	—
Do. 3rd &c. ..	do.	0 6 9	0 7 3

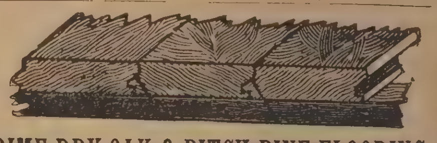
HARD WOODS.

		£ s. d.	£ s. d.
Ash, Quebec	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba ..	per ft. sup.	0 0 4 5/32	—
Do. Honduras ..	do.	0 0 3 21/32	—
Do. Tobasco	do.	0 0 4	—
Elm, Quebec	per load	0 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0 0 4 9/32	—
Do. African ..	do.	0 0 2 29/32	—
Do. St. Domingo	do.	0 0 6⅜	—
Do. Tobasco ..	do.	0 0 3 7/32	—
Do. Cuba ..	do.	0 0 4 27/32	0 0 3 13/16
Oak, Dantzic and Memel	per load	3 15 0	5 7 6
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ..	do.	6 0 0	17 10 0
Wainscot, Riga (Baulk)	do.	3 15 0	5 15 0
Do. Odessa Crown	do.	3 15 0	5 15 0
Walnut, American ..	per cub. ft.	0 3 1	—

The New Small Pox Hospital, Tyne Dock, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves, with descending smoke flues and patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

FLOORING BLOCKS.

Per 100 Blocks out of sizes.	YELLOW		PITCH PINE
	At Wharf.	ex Ship within one month.	At Wharf.
17¼ × 3 × 3	13 8	12 9	17 6
17¼ × 3 × 2	8 11	8 2	12 6
17¼ × 3 × 1½	6 10	6 3	9 6



PRIME DRY OAK & PITCH PINE FLOORING,
With Special Joint to conceal Nails—
1¼ × 4¼ Oak, 56/9 Pitch Pine, 26/9 per square
1 × 4¼ " 45/6 " 22/6 "
These prices include desiccation.

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SOIL PIPES, RAIN WATER PIPES,
MANHOLE COVERS, PUMPS IN VARIETY
CISTERNS, TUBES, &c., &c.,
HOT-WATER TANKS, UNDERGROUND PIPES.
A large assorted stock of RANGE BOILERS.
Special sizes to Customers' requirements at a short notice.
Special Quotations for Quantities sent Carriage Paid to any Railway Station.
Works and Offices { SOUTHWARK ST., LONDON, S.E.; and VULCAN FOUNDRY, THORNABY-ON-TEES.

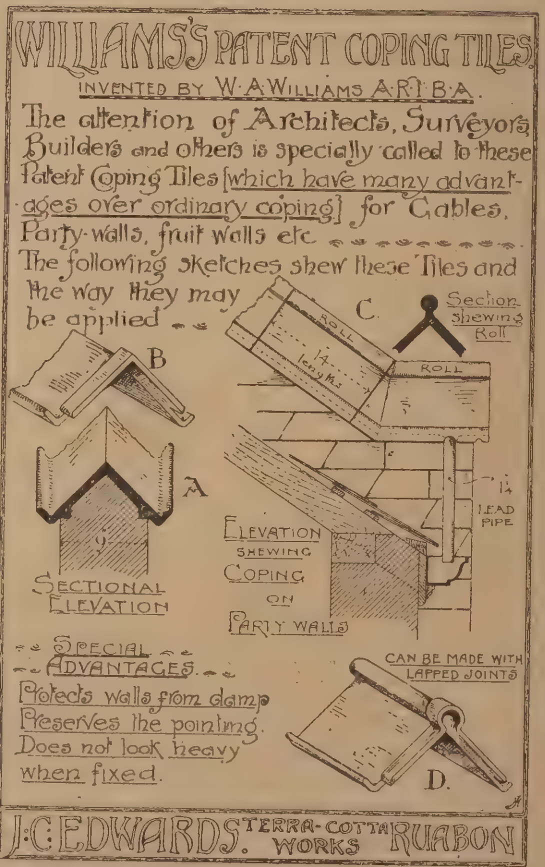
BUILDING WORKS,
SEWERAGE,
GAS AND WATER
SCHEMES.

THE COUNCILS JOURNAL.
MONTHLY, SIXPENCE.

The Councils Journal, the organ of the Parish and District Councils Association, circulates amongst members and officials of Town, District and Parish Councils, Boards of Guardians, School Boards, &c., &c., and publishes a monthly column, "The Work of the Councils," giving information as to Building Works, Sewerage, Gas and Water Schemes proposed by local bodies.

Eyre & Spottiswoode, East Harding St., London, E.C.

IMPROVED COPING TILE
(*PATENTED*)
For GABLES, PARTY WALLS, &c.



WILLIAMS'S PATENT COPING TILES.
INVENTED BY W. A. WILLIAMS A.R.I.B.A.
The attention of Architects, Surveyors, Builders and others is specially called to these Patent Coping Tiles [which have many advantages over ordinary coping] for Gables, Party-walls, fruit walls etc. The following sketches shew these Tiles and the way they may be applied.

SPECIAL ADVANTAGES.
Protects walls from damp.
Preserves the pointing.
Does not look heavy when fixed.

J. C. EDWARDS. TERRA-COTTA WORKS RUABON

This Coping prevents the water collected by it from running down and soaking into the wall beneath.

The end tile is provided with outlets, from which the water can be conducted to the eaves gutter or elsewhere by a small lead pipe, or the outlet holes can be omitted, the tile throated and set to let the water shoot clear of the building, but the pipe is recommended and the expense is trifling.

It can be used as well on the flat, as raking, for with a little care it can always be laid to a slight fall, the outlets then should not be more than 10 feet apart.

The Tiles are set and jointed in cement, the edges being scratched up rough to form a key, making a permanent and water-tight joint.

It will be seen that with these Copings the walls are protected from dampness, pointing preserved, rooms in roof kept dry, and defective flashings and fillets do not cause so much leakage.

No other ordinary Coping answers the same purpose.

Property and Land Sales.

By order of the Mortgagee.

CHISWICK, W.—With possession.—In the centre of a thickly-populated and favourite residential district, just off an important main thoroughfare; 10 acres of Freehold Building Land, beautifully timbered and possessing a frontage of 900 ft. to Duke's Avenue, with its fine adornment of noble chestnut trees, and Barrowgate Road, affording an unrivalled opportunity for a successful building operation. Valuable beds of sand and gravel underlie portions of the Estate.

MESSRS. MATTHEWS, MATTHEWS, and GOODMAN will SELL by AUCTION, at the Mart, Tokenhouse Yard, E.C., on Monday, July 22, 1901, at 2 o'clock precisely, in one lot, the very valuable FREEHOLD PROPERTY, known as Devonhurst, Duke's Avenue, Chiswick, comprising a noble mansion of modern construction, with fine suite of reception rooms, and 17 bed and dressing rooms, standing in its own grounds of about 10 acres.

Particulars, plan, and conditions of sale of Messrs. G. F. Hudson, Matthews & Co., Solicitors, 32, Queen Victoria Street, E.C.; at the Mart, E.C.; and, with orders to view, at the Auctioneers' Offices, as above.

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TELSCOMBE CLIFFS, near BRIGHTON. On the South Downs, facing the sea.—LAND SALE, SATURDAY, JULY 20th, 1901, in a MARQUEE on the Estate. Luncheon at ONE o'clock. Sale at THREE o'clock, when 100 Choice Sites will be sold, Freehold, land tax and tithe free. Repayment by instalments if desired. Free conveyances. A special train will leave Victoria and London Bridge at Ten o'clock on the sale day, calling at Clapham Junction and East Croydon. Return tickets, including luncheon, 5s.

MESSRS. HARMAN BROS. have received instructions to SELL by AUCTION on SATURDAY, JULY 20th, 100 valuable FREEHOLD BUILDING SITES, in choice situations facing the sea, and main avenues on the estate, which is delightfully placed on the summit of chalk cliffs facing the English Channel.—Particulars, plans, and tickets may be had of T. H. E. FOORD, Esq., Solicitor, 15, Philpot Lane, Fenchurch Street, E.C.; of Messrs. WARD, BOWIE, & CO., Solicitors, 7, King Street, Cheapside; of Messrs. HOOKER & WEBB, 4, High Street, Croydon; of Messrs. FAIRBROTHER, MORAN, & CO., 26, Queen's Road, Brighton; and of the Auctioneers, 25, Ironmonger Lane, Cheapside, E.C.

By EDWIN FOX and BOUSFIELD, at the Auction Mart, on WEDNESDAY next, July, 10th, at Two o'clock. Upset price, £1,800.

ISLE OF WIGHT.—22 Acres Building Land on the Sea Front.—FREEHOLD BUILDING PROPERTY, known as the Bouldnor-on-Sea Estate, well situate, close to Yarmouth, about a mile from the railway station; the property, which covers an area of about 22 acres, has extensive frontages to the high road from Yarmouth to Newport, and to other good roads, and affords uninterrupted sea-views across the Solent to the Hampshire coast; it is available for the erection of villa residences and bungalows, and from the invigorating climate, as well as its sheltered position, part of it is eminently suited for the erection of a good hotel or hydropathic establishment. Possession on completion; if not sold in one lot, then in building plots. Particulars of the Vendor's solicitors, Messrs. Edwards, Heron & Co., 24, Laurence Lane, Cheapside, E.C., and at Messrs. EDWIN FOX and BOUSFIELD'S Office, 99, Gresham Street, Bank, E.C.

SMALL BUILDINGS or RESIDENTIAL ESTATE of nearly eight well-wooded acres, on gravel and sand soil, in a charming position on the summit of Kingston Hill, adjoining, and with immediate access to, the highest part of Richmond Park. Thirty minutes' train ride from City and West End. Easy walk to Norbiton and Malden stations, and admirably situate for the erection of small healthful residences for the occupation of City clerks, &c. TO BE LET on Building Lease, or FREEHOLD TO BE SOLD. Part of purchase-money may remain on mortgage.—Agents, MORANT & CO., 91, New Bond Street, W.

STEEL JOIST BUSINESS.—150 TONS of STEEL JOISTS to be disposed of, with GOODWILL of only BUSINESS in town of population of 100,000 on South Coast.—Apply to Messrs. Bramall, White, and Sanders, 23, Leadenhall Street, E.C.

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THE BEST & STRONGEST BELT FOR DRIVING IN HEAT, STEAM, DAMP, WATER, OR OUT OF DOORS.

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Unbreakable, Clean, Healthy.
Being largely adopted by Architects everywhere.
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GATESMITHS AND WROUGHT IRON WORKERS.

BRICKFIELD, with unlimited red Foreham brick-earth, and Siding TO BE LET or SOLD.—Apply H. I. SANDERS, 104, Bevois Valley, Southampton.

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MISCELLANEOUS.

R.I.B.A. EXAMS. PREPARATION, personally or by correspondence, in three, six, nine, or twelve months' courses. Architectural Lending Library. Special three months' finishing courses.—For full particulars apply to Messrs. HOWGATE & BOND, Associates R.I.B.A., 115, Gower Street, W.C. (close to the British Museum).

R.I.B.A., Society of Architects, Surveyors' Institute (Building Section), and Civil Service Technical Examinations. Preparation by correspondence or in residence.—MIDDLETON & CARDEN, 19, Craven Street, Strand, W.C.

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The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two.

ARTICLED PUPIL required at once in an Architect's Office. Small premium.—Apply, Messrs. BUCKNALL and ELLIS, 10, Fisher Street, Swansea.

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A GOOD PRACTICAL FOREMAN PLASTERER, disengaged 15th inst., seeks engagement in Town or Country. First-class references.—"C.," 9, Etherdon Street, Walworth, London, S.E.

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ARCHITECTURAL ASSISTANCE rendered by young Architect at own or employer's office. Sketches, working drawings, specifications, levelling and surveys, &c.—FRASER, 52, North End, Croydon.

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GENERAL FOREMAN or CLERK OF WORKS seeks Re-engagement. Town or Country. Carpenter and Joiner. Age 38. Good references and testimonials. Just completed large mansion.—P. T. BELMONT, Waverly Road, Kenilworth.

GENERAL FOREMAN seeks RE-ENGAGEMENT. Aged 35. Town or country; country preferred. Just completing country job. Careful with extras and omissions.—D. Read, Foreman of Works, Holmbury St. Mary, Dorking, Surrey.

GENERAL FOREMAN DISENGAGED. Carpenter and Joiner. Many years' experience in difficult shoring and underpinning heavy buildings. Used to Gothic and general London work. Good references.—J. B., 66, Acre Road, Kingston.

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JOINER (24) wants EMPLOYMENT in Manchester district. Bench preferred.—E. ROBINSON, Brant Broughton, Newark.

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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ABINGDON.—For additions to Roysses Schools, for the Governors. Mr. J. G. T. West, architect, The Knowle, Abingdon:—

Bloxham	£6,997
Williams	6,425
L. Jones	6,300
Wheeler	6,315
Oxford Co-operative Company	6,100
Kingerlee	6,067
Buckle,* Abingdon	5,888
Colbourne	5,826

* Provisionally accepted.

BANBURY.—For the erection of new school buildings for 518 children in Britannia Road, Banbury, for the Wesleyan Day School Trustees. Mr. William F. Bird, architect, Midsomer Norton, Somerset. Quantities by the architect:—

T. H. Kingerlee & Sons, Oxford	£5,150	0	0
W. J. Bloxam	5,699	0	0
John Grant & Son	5,079	17	0
J. S. Kimberley	5,022	0	0
J. F. Booth	5,000	0	0
W. J. Harding	4,786	12	6
G. Orchard & Sons	4,725	0	0

[Rest of Banbury.]

BECCLES.—For the erection of a new Board School:—

F. C. Thurman	£4,011	12
Youngs & Son	3,730	0
Boddy & Pope	3,645	0
G. A. Dunn & Son	3,633	0
G. E. Hawes	3,552	0
Grimwood & Sons	3,479	0
Hipperson Bros.*	3,216	0

* Accepted.

BUNCRANA, &c. (IRELAND).—For the erection of five dwelling houses at Victoria Park, Buncrana; two dwelling houses at Dunfield Street, Waterside; one dwelling house at Collon, Londonderry; one dwelling house and offices at Lisahally, Londonderry. Mr. T. Johnston, architect, 11 East Wall, Londonderry:—

Five dwelling houses at Buncrana.

R. Colhoun, Strand Road	£2,410	0	0
J. Shannon, Magazine Street	2,095	0	0
J. A Fulton, Fountain Street	1,790	0	0
Shannon & Routledge, 85 Fountain Street	1,783	0	0
W. J. Maultsaid, Rosemount	1,685	0	0
Stitt & Co.,* Strand Road	1,647	10	0

Two dwelling houses, Dunfield Street, Londonderry.

W. J. Maultsaid	£1,600	0	0
D. Doherty, Spencer Road	1,200	0	0
W. Cooke,* 2 Miller Street	1,034	0	0
Crooks & Ferguson, Orchard Lane	1,010	0	0
J. A. Fulton	989	0	0
Stitt & Co.	900	0	0

One dwelling house, Collon, Londonderry.

M. Jack, Collon	£223	10	6
W. Cooke	185	0	0
Stitt & Co.	180	0	0
W. J. Maultsaid	175	0	0
W. J. Mooney,* Strand Road	167	0	0
S. McLaughlin, Bishop Street	162	0	0

[Rest of Londonderry.]

* Accepted.

DYSART.—Accepted for the extension of sewer at Edington Place, for the Town Council. Mr. D. Forbes Smith, A.R.I.B.A., surveyor. Quantities by the surveyor:—

David Wilkie, Sinclairtown	£97	6

EAST MOLESEY.—For the erection of a new police station at East Molesey, for the Metropolitan Police:—

		A.
T. Parker	£4,498	£120
Holloway Bros.	4,485	85
C. Ansell	4,450	100
Higgs & Hill	4,384	90
O. Craske	4,365	25
S. Hart	4,275	50
Gaze & Sons	4,159	35
Messom & Sons	4,079	100
Martin, Wells & Co.	4,044	—
G. Challis	4,032	100
Oldridge & Sons	3,991	75
E. Patterson	3,780	100

A. Old material.

ENFIELD.—For making-up the following private streets within their district, for the Enfield Urban District Council, viz., St. Stephen's Road, Enfield Wash; Park Road, Freezywater. Mr. R. Collins, surveyor:—

St. Stephen's Road.

Griffiths, Bishopsgate	£1,268	0	0
T. Adams, Wood Green	1,181	0	0
G. Porter, Hackney Road	1,098	11	4
E. J. Betts,* Enfield Highway	1,075	0	0

Park Road.

Griffiths	£1,026	0	0
T. Adams	1,016	0	0
G. Porter	973	10	9
E. J. Betts*	835	0	0

* Accepted.

ENFIELD.—For the construction of a sewer, with manholes, ventilators, and other works incidental thereto, at the Hadley portion of the district, for the Urban District Council. Mr. Richard Collins, surveyor:—

G. Bell & Sons, Tottenham	£4,979
C. Ford,* Harlesden	4,387

*Accepted.

HINCKLEY.—For the erection of a new post office at Hinckley, for the Commissioners of H.M. Works and Public Buildings:—

J. Cracknell	£3,675	0	0
J. E. Johnson & Son	3,600	0	0
T. Barker & Son	3,500	0	0
A. Jeffcote	3,495	5	8
G. H. Marshall	3,385	0	0
King & Ridley	3,258	0	0
W. Corah	3,230	0	0
W. Moss	3,207	5	0
T. & G. Harrold	3,120	0	0
Scarr, Jowett & Co.*	3,069	10	0

* Accepted.

KIRKCALDY.—Accepted for the painting of the Upper and Lower Schools, Sinclairtown, for the Dysart Burgh School Board. Mr. D. Forbes Smith, A.R.I.B.A., architect:—

James Henderson, Gallatown	£76	16

KIRKCALDY.—Accepted for the erection of shops and dwellings in Commercial Street, Pathhead, for Mr. Alexander Lees. Mr. D. Forbes Smith, A.R.I.B.A., architect. Quantities by the architect:—

Mason D. Wilkie, Sinclairtown	179	18	0
Plasterer—A. Hutchison, Sinclairtown	29	8	0
Joiner—A. Carmichael, Pathhead	£209	17	6
Plumber—A. Kirk, Pathhead	27	15	0
Slater—R. Page, Pathhead	15	0	0

(Total, £461 18s. 6d.)

KIRKCALDY.—Accepted for the erection of tenements in Harriet Street, Sinclairtown, for Mr. Colin Cummings. Mr. D. Forbes Smith, A.R.I.B.A., architect, Kirkcaldy:—

Mason—Henry Masterton, Sinclairtown	£775	0
Plasterer—Henry Masterton, Sinclairtown	250	0
Joiner—David Wishart, Pathhead	582	0
Plumber—Andrew Kirk, Pathhead	117	15
Slater—David Johnston, Dysart	54	0

(Total, £1,778 15s.)

LONDON.—Accepted for repairs to off-license premises, Old Ford, E. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, E.C.:—

Sheffield Bros.	£185

* Accepted.

LONDON.—For the erection of shops and flats at Lower Clapton, N.E. Mr. Herbert Riches, architect and surveyor, 3 Crooked Lane, King William Street, London, E.C. Quantities supplied:—

W. Holt & Sons	£15,098	Todd & Newman	£13,333
A. Porter	14,845	Green & Smith	13,280
S. J. Scott	14,073	Fred. & T. Thorne	13,000
J. Grover & Sons	13,650	Sheffield Bros.*	12,993
Courtney & Fairbairn	13,525		

[All estimates are exclusive of smith's, plumber's, hot-water, and sanitary engineer's, and bell hanger's work, stores, &c.].

* Accepted.

LONDON.—For repairs to shop premises, Walthamstow, E. Mr. Herbert Riches, architect, 3 Crooked Lane, King William Street, E.C.:—

M. Calnan & Son	£172	2	0
E. S. Hammerton	153	8	6
E. Jackson	125	0	0
W. Hennessey	121	13	0
S. White*	98	10	0

* Accepted.

LONDON.—For repairs at "The Duke of York," Hoxton, N. Messrs. C. Foulsham & Herbert Riches, architects, 3 Crooked Lane, King William Street, E.C., and Bromley-by-Bow, E.:—

Courtney & Fairbairn	£625
Sheffield Bros.	485
T. Osborn & Sons*	437

* Accepted.

LONDON.—For repairs at "The Unicorn," Notting Hill, W. Messrs. C. Foulsham & Herbert Riches, architects, 3 Crooked Lane, King William Street, E.C., and Bromley-by-Bow, E.:—

J. T. Robey	£213
T. Osborn & Sons	20[illegible]
A. W. Derby*	178

* Accepted.

LUTON.—For addition to warehouse, King Street, for Messrs. Barford & Sons. Mr. A. Wilkinson, architect, 84 Inkerman Street, Luton:—

G. Smart	£1,146
Foster	1,115
Neville Bros.	993
Angel	965
Saunders & Son*	923

* Accepted. [All of Luton.]

LYNN.—For new surgery, waiting room, stabling, and other alterations to residence, Stonegate Street, Lynn, for Dr. H. C. Allinson. Messrs. Wm. Jarvis & Son, architects, Paradise Parade, King's Lynn:—

W. H. Brown, Bridge Street	£1,004	12	0
Tash, Langley & Co., London Road	953	16	6
Robert Dye, South Gates	930	0	0
Bardell Bros.,* London Road	906	0	0

* Accepted. [All of Lynn.]

LONDON, S.W.—For the construction of the foundations of Block III. of the new Admiralty buildings, for the Commissioners of H.M. Works and Public Buildings:—

		A.
Foster Bros.	£30,885	—
J. Smith & Sons, Ltd.	29,791	—
Foster & Dicksee	25,812	£279
B. E. Nightingale	25,175	—
Pethick Bros.	24,740	—
E. Nuttall	24,240	312
W. King & Son	22,900	—
Higgs & Hill, Ltd.	22,400	—
H. C. Lovatt	20,910	302
J. Mowlem & Co.	20,878	261
J. Allen & Sons, Ltd.	17,950	150
Holloway Bros.	17,880	432
Leslie & Co., Ltd.	17,383	—
Perry & Co.	17,289	428
J. Chessum & Sons*	15,926	350

A.—Allowance if Limmer asphalte be used.

* Accepted.

PORTH (WALES).—For the erection of two shops and offices at Hannah Street, Porth, for Mr. J. Preece. Mr. Edwin Jones, architect, Porth:—

Enoch Bros., Trebanog, near Porth	£1,655	0
D. Richards, Ynyshir, Rhondda	1,500	0
R. Farr, Glyn Street, Porth	1,476	8
C. Jenkins & Son,* Porth	1,475	0

* Accepted.

SOUTH STONEHAM (HANTS).—For re-drainage of the workhouse, West End, for the Guardians. Messrs. W. H. Mitchell, Son & Gutteridge, surveyors, Southampton:—

S. Saunders, London	£2,200	0	0
Witt Bros., Bitterne	2,150	0	0
Grounds & Newton, Bournemouth	2,130	0	0
W. Roles & Son, Totton	1,975	12	9
Jenkins & Son, Southampton	1,945	0	0
Coston & Co., Southampton	1,895	0	0
J. Nichol,* Bitterne	1,695	0	0

* Accepted.

WEST HAM.—For supply of tramway machinery, &c. for electrical purposes, for the West Ham Town Council:—

Tramway machinery.

V. Coates & Co.	£22,000
Cole, Marchent & Morley	20,577
J. & H. Maclaren	18,0[illegible]2
Dick, Kerr & Co.	17,750
Scott & Mountain	1[illegible],598
British Westinghouse Co.	14,433
Lancashire Motor & Dynamo Co. (alternative)	14,318
Verity & Co.	13,598
Bergtheil & Young	13,597
Lancashire Motor & Dynamo Co. (alternative)	13,425
Lancashire Motor & Dynamo Co.	13,407
Thames Ironworks Co.	13,200
J. Fowler & Co.	12,855
Siemens Bros.	12,774
General Electric Co.	12,700
Ferranti	12,700
Mather & Platt	12,530
British Schuckert Co.	12,349
Brush Electrical Co.	12,270
F. Suter & Co.	12,180
Johnson-Lundell Electric Traction Co.	12,084
Parsons	11,829
Witting Bros.	11,790
International Engineering Co.	11,710
Allgemeine Elektricitäts-Gesellschaft, Berlin	10,840
Allgemeine Elektricitäts-Gesellschaft (alternative)	8,926

[Engineer's estimate, £25,000.]

Eleven water-tube boilers and fittings.

Rowland & Co.	£17,520
J. Thompson, Wolverhampton	16,250
Stirling Boiler Co.	15,214
Babcock & Wilcox	14,720
R. Hornsby & Sons	13,791

[Engineer's estimate, £18,000.]

The tenders have been referred to committee.

WORKSOP.—For the erection of new infirmary buildings on Kilton Hill site, Worksop, for the Guardians. Mr. Herbert C. Scaping, architect, Court Chambers, Grimsby:—

T. Roper, Sheffield	£19,949	10	0
J. G. Cooling, Gainsborough	17,880	14	6
G. Brown & Son, Newark	17,400	0	0
C. Longden & Son, Sheffield	17,020	12	6
W. Hall, Worksop	16,980	0	0
H. Vickers, Nottingham	6.900	0	0
Cahill & Leverton, Worksop	16,494	0	0
R. Stewart, Rotherham	16,130	0	0
M. Grantham, Sheffield	16,100	0	0
G. G. Middleton, Worksop	15,950	0	0
J. Cooper & Son, Ltd., Nottingham	15,616	0	0
D. Gill & Son, Doncaster	15,577	0	0
J. H. Vickers, Ltd., Nottingham	15,490	0	0
A. B. Clarke,* Nottingham	14,500	0	0

* Accepted.

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BUILDERS' JOURNAL,
EFFINGHAM HOUSE, ARUNDEL ST.,
STRAND, W.C.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

JULY 17, 1901.
No. CCCXXXVI.

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An Architectural Causerie.

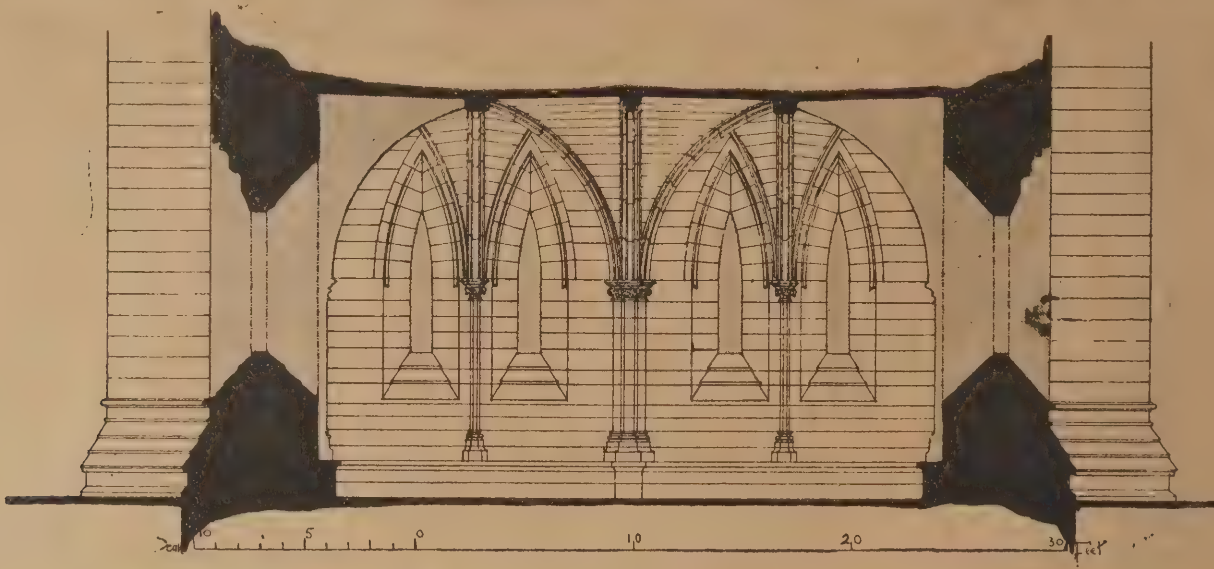
Rural Building By-laws.

THE Local Government Board has just issued new model by-laws with regard to new buildngs and certain matters in connection with building in rural districts. These have been badly needed for a long time. The local councils have always had power to alter the suggested by-laws of Part III. of the Act of 1890, which were certainly too stringent in rural districts; but it is a fact that in but few cases have local by-laws been altered from those suggested, rural and urban authorities usually swallowing them whole, as their by-laws having to be approved by the Local Government Board it was but natural they should think such would only be sanctioned by it. Much agitation has been going on in regard to these by-laws for some time past, and the Royal Institute of British Architects has twice deputed the Secretary to the Board to get them altered. The old by-laws drawn up under the Public Health Act of 1875 have considerably aided in the depopulation of the country, with the consequent aggravation of the housing problem in large towns, by forcing the cost of houses up beyond what could be afforded by landowners and tenants. We hope much from these new by-laws, which on the whole are very sensible. The suggested new by laws are confined to matters affecting health, and in the memorandum accompanying the by-laws attention is advisedly drawn to the powers the local authorities have of altering them should they desire to adopt them, and this can be done for part only of a contributory place. The present series contains no clauses dealing with questions of stability or the prevention of fire, or with the level, width and construction of new streets—matters that have been the chief cause of increased cost of building, and of hampering artistic building. Provision is made for excluding from the operation of the by-laws practically all buildings which are not dwelling-houses, or used wholly or partly for human habitation, or for the habitual employment of any person; thus the erection of buildings for agricultural purposes and outbuildings is wholly unrestricted. The by-laws make special provision for securing the dryness of the ground surface beneath buildings, and for preventing the entrance of damp exhalations or of impure ground air, but this clause only applies where the dampness of the site or the nature of the soil renders such a precaution necessary. A damp course is required in every wall of a new building for human habitation, and also a double wall to act as a vertical damp course where any part of the lowest storey is below ground, and the soaking of water through parapets is provided against. In other respects, as to size, material, position, strength, &c., the builder is entirely unfettered. Other by-laws provide for a proper space to secure a free circulation of air, that required in front being allowed to extend over the public highway, and at the back allowance being made in exceptional cases such as where parks or other open spaces occur. With regard to the ventilation of buildings, no undue restrictions are made on the position or shape of windows or fireplaces. A space beneath the building is stipulated for in order to allow of damp or foul air being dispersed and of preserving the timbers from decay. This is all very well in regard to a timber floor, but provision should, we think, have been made for allowing a tiled or brick floor upon a non-porous concrete layer; many old buildings have this and are perfectly healthy. Another by-law requires the drainage of the subsoil of a new building, but it will only need to be observed in cases where the site is naturally damp. The lowest storey is not to be placed at such a level as will prevent it being drained. Where drains are used but ordinary good work is insisted upon. Water-supplies are protected. It will be seen from this that the new by-laws merely insist upon the mere necessities of proper building, and it behoves architects and societies to urge their adoption in every district where they can reasonably be expected.

The Workmen's Compensation Act.

THE case of *Edwards* v. *Botting* reported on p. 460 of this issue affords another instance of absurd and faulty character of the Workmen's Compensation Act. This case was dependent upon whether the ridge-tile was on at the time of the accident or not, and as to whether the stipulated height of 30ft. should be measured from the bottom of the footings to the ridge. The restriction of the Act to buildings over the exact height of 30ft. is absurd, and it passes all understanding how ever such a clause should have been put in and passed. That the Act should be amended is a crying necessity; that a workman injured on a building through no fault of his own, and where the work is not of a hazardous nature and taken by the man in consequence of allowance being made him for the risk he takes, should be compensated by his employer is only fair. However, it is to be regretted in regard to this present case that no decision has been given in a higher court than that of a county. It is a well-known fact that when lawyers and other unpractical laymen get hold of questions in regard to building what a hash they make of them, and this especial case is only a further example. To rule that directly the first brick was laid the building commenced, is ridiculous; if the question is as to where the building starts it seems to us absurd to ignore the concrete foundations, for what are they in a general sense but footings, their object being to distribute the pressure over a larger area; but of course the case should not be dependent upon this, for with exactly similar buildings the foundations can and should vary with different soils. Then, with regard to the ridge-tile being reckoned in the height of the building, this might mean anything, for the difference of the ridge being off or on does not affect the height of the building materially at all so far as the workmen are concerned, and on this count the extra height of a finial might bring the building within the Act.

HOUSE AT COBHAM, SURREY. M. H. BAILLIE SCOTT, ARCHITECT.



CHAPTER-HOUSE, GLASGOW CATHEDRAL: SECTION LOOKING NORTH. MEASURED AND DRAWN BY ALEXANDER T. HEATHCOTE.

IMPRESSIONS OF GLASGOW CATHEDRAL.

BY J. JEFFREY WADDELL.

ALTHOUGH Glasgow Cathedral is comparatively small, it is most interesting both architecturally and archæologically, and it is the most complete mediæval building in Scotland. The exterior of the cathedral, however, is somewhat disappointing. Viewed from the north or south, the long line of the roof, unbroken save by the central tower and shallow transept, is uninteresting. The want of the western towers is consciously or unconsciously felt. The east end, while effective enough from the interior, always appears, viewed from without, to be patched and unworthy of a cathedral like Glasgow.

Seen from the Cathedral Square the aspect of the cathedral is more noble. Its grand west doorway is seen to advantage, the outline is good, and the ancient monuments in the foreground and the Necropolis in the background round the whole into an harmonious picture. The knowledge, however, that the cathedral once possessed western towers and that they were ruthlessly destroyed is a mental discord to what would otherwise be a completely satisfactory picture.

Probably the best general view of the cathedral—but one from which it is unfortunately very seldom seen—is from the Necropolis. Here the ground rises from the level of the banks of the Molendinar to a height from which the cathedral may even be looked down upon. Viewed from the banks where once the Molendinar ran, the cathedral appears firmly planted in stateliest fashion upon the opposite bank, towering far into the sky in outlines at once bold and graceful, vigorous and delicate. Here the long and somewhat harsh line of the roof is lost, and in its place we see a compact but shapely mass gathered round and supporting the spire. Especially fine does it look when its tower and crow-stepped chapter-house appear silhouetted against the brightness of the evening sky.

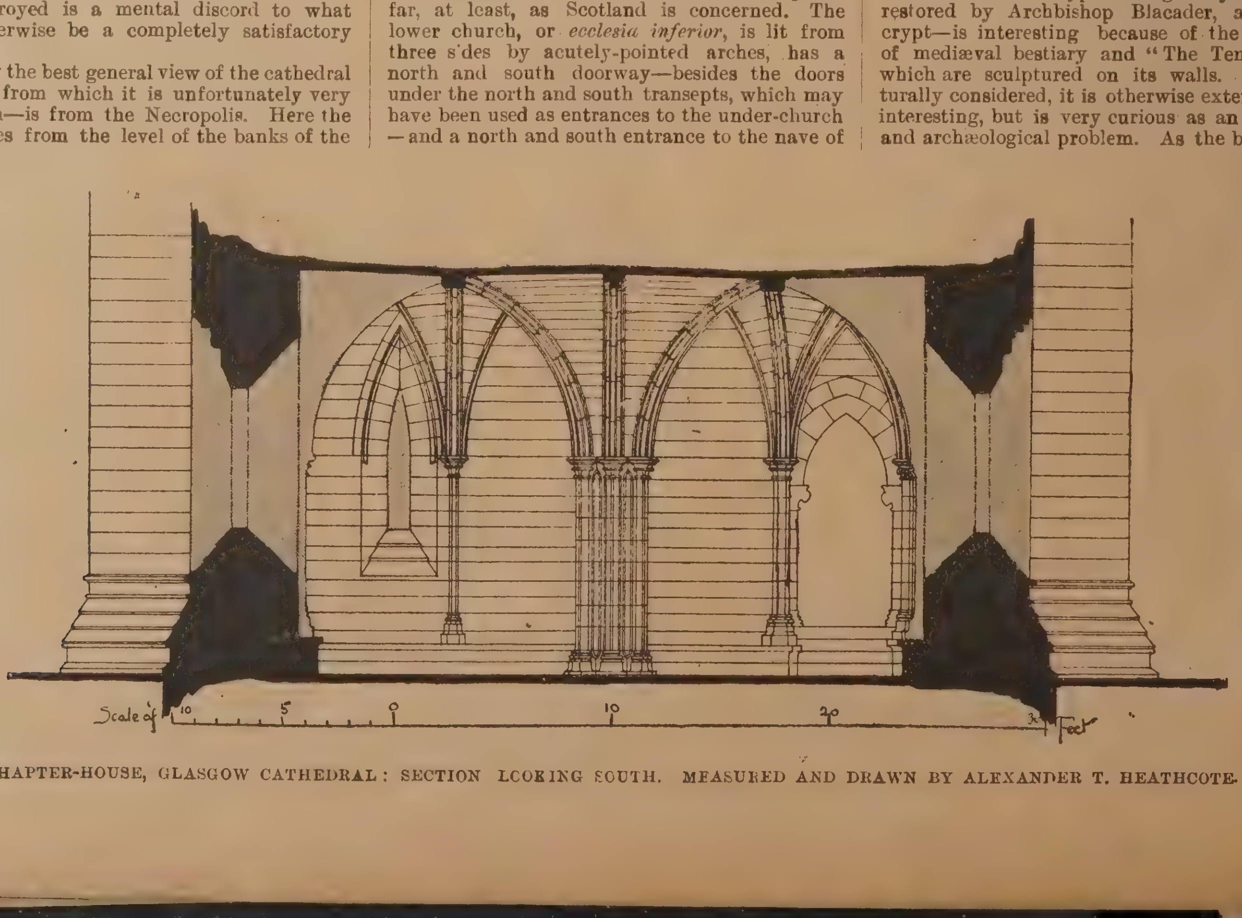
In spite of the fact that the cathedral has been built at so many different periods the result is wonderfully harmonious. Even the modern work rounds off and completes the old and is singularly unobtrusive—if it has no other merit, it is at least inoffensive—and, considering what one sees which passes for "restoration" in other cathedrals, Glasgow may consider herself fortunate. It is greatly to be regretted, however, that the mouldings and carvings have been so largely and recklessly "restored," and in so unsatisfactory a cement.

Viewed from the north, south or east, one is at once struck by the fact that the cathedral is two-storeyed, and that it is therefore unique as far, at least, as Scotland is concerned. The lower church, or *ecclesia inferior*, is lit from three sides by acutely-pointed arches, has a north and south doorway—besides the doors under the north and south transepts, which may have been used as entrances to the under-church—and a north and south entrance to the nave of the cathedral, and therefore cannot be properly termed a crypt. This lower church is, especially internally, the glory of Glasgow Cathedral.

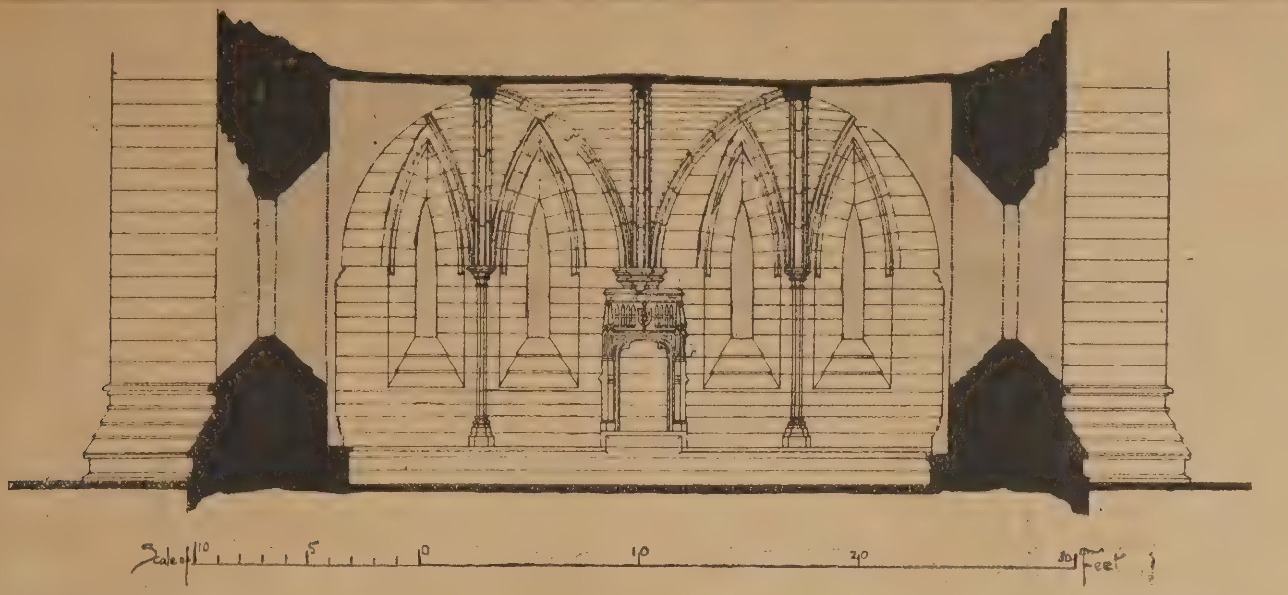
But the exterior is not to be despised. The doorways are very fine, especially the south porch, which is one of the finest of its class. Although it does not project beyond the line of the buttresses and is only covered with a lean-to roof, yet with its side arcading and benches it is quite an admirable piece of design. The north porch is neither so elaborate nor so good. It is not roofed over, and the side arcading, visibly cutting as it does into the side buttresses, looks weak.

But while the architect has not been so successful here, he has proved himself very ingenious in the way in which he has managed to overcome the difficulty of finishing the two centre windows of the east end. As the width of the choir between the aisles is considerably less than twice the width of the aisles, some variation of the design had to be made; so the centre butt was reduced by 6in., and 3in. were taken from either side by set-offs on the inner sides of the two centre bays and the two lights were spanned by the single hoodmould.

The exterior of the abandoned south transept called Blacader's Crypt—though only roofed and restored by Archbishop Blacader, and not a crypt—is interesting because of the examples of mediæval bestiary and "The Temptation" which are sculptured on its walls. Architecturally considered, it is otherwise externally uninteresting, but is very curious as an historical and archæological problem. As the base of the



CHAPTER-HOUSE, GLASGOW CATHEDRAL: SECTION LOOKING SOUTH. MEASURED AND DRAWN BY ALEXANDER T. HEATHCOTE.



CHAPTER-HOUSE, GLASGOW CATHEDRAL: SECTION LOOKING EAST. MEASURED AND DRAWN BY ALEXANDER T. HEATHCOTE.

nave is carried up to either side of the door from the church, it is evidently an addition which was not contemplated, as some suppose, at the time when the erection of the nave had proceeded at least as high as the top of the door. The base of this aisle is also different from that of either the nave or the choir.

With regard to the windows, the chief of these, the great west window and the windows of the north and south transepts, are "restorations" or, to be more correct, modern designs; the others are very simple, and with the exception of those of the choir north aisle are of the usual early type. The last-mentioned windows, however, are exceedingly original—not to say peculiar—and cannot be said to be very satisfactory as pieces of design. The window is divided into three lights of about the same height by two broad mullions with bold mouldings, and the tympanum is pierced in the centre by a quatrefoil, and on either side there are trefoil-headed openings with little shafts with caps to receive the mouldings.

The windows of the south aisle of the nave are very different in design from those in the north aisle, are of a later date and have their tympanums filled with geometrical tracery. The lower two-light windows in the transept gables have also geometrical tracery springing from caps of shafts on jamb and mullion. The composition of these is admirable. The nave clearstory windows are simple two-light windows with tracery, but without cusping. These externally somewhat resemble those of the choir; and as the centre aisle of the cathedral was never intended to be vaulted no flying buttresses are used, so that without these and so short a transept the clearstory appears almost continuous from one end of the cathedral to the other.

Both the aisles and the clearstory are surmounted with a heavy parapet supported on corbels and pierced at intervals by large gargoyles many of which are quaint and grotesque.

The most typically Scotch part of the cathedral is the chapter-house and sacristy. With its crow-stepped gables—which give it quite a semi-domestic appearance—its picturesquely-weathered buttress tops, its curiously but effectively-weathered shields, its attenuated but equilateral-headed windows to the sacristy, but with its acutely pointed but stumpy lancets beneath—all contribute to make an exceedingly picturesque and interesting structure. Like the aisle of Car-Fergus, it was founded in the thirteenth century (by Bishop William, as the inscription on the dean's seat declares), but was not roofed over until the fifteenth century, when Bishops Lauder, Cameron and Turnbull completed it, and the first inserted the dean's seat.

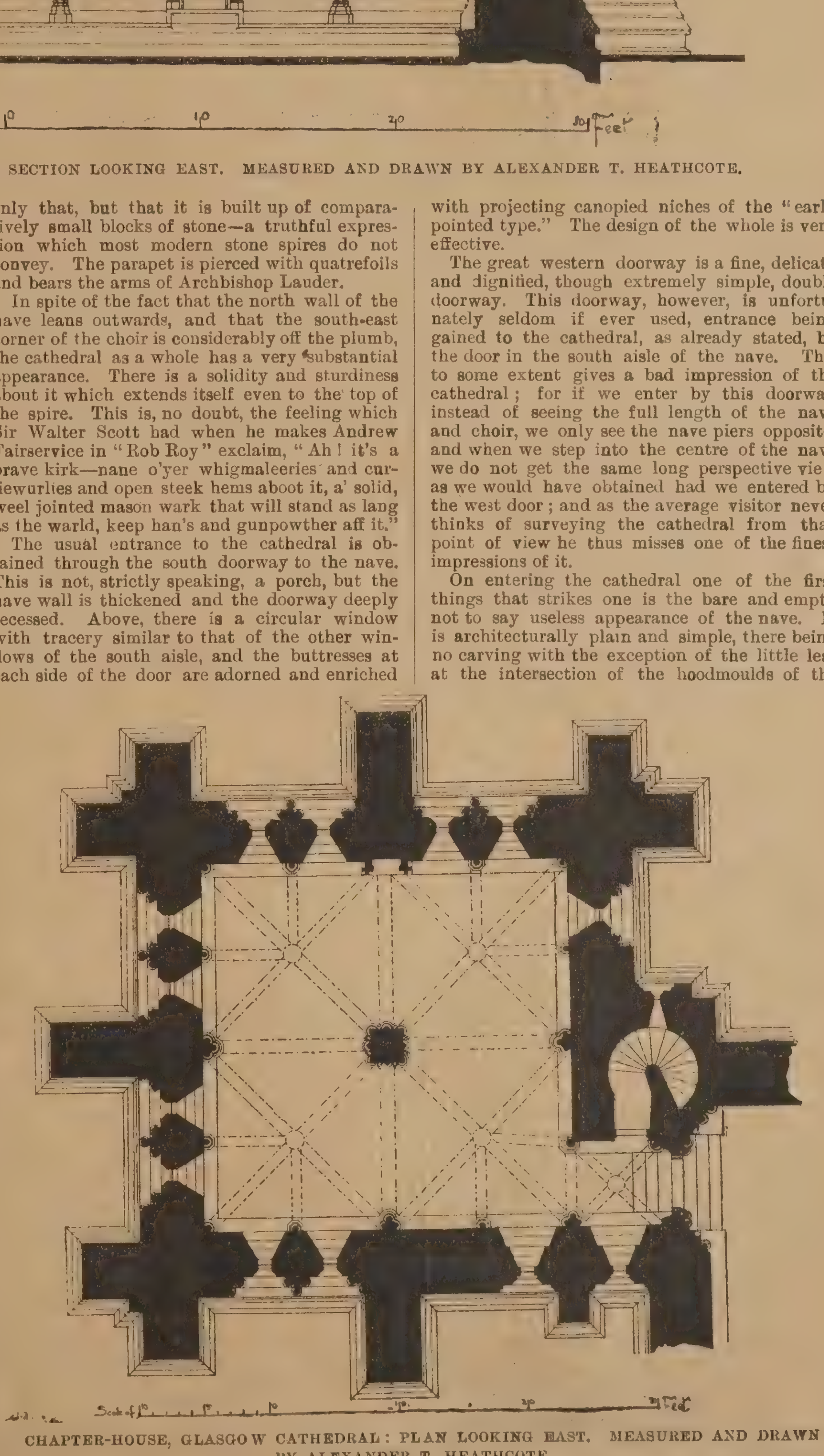
One of the finest features of the exterior is the central tower. Seen diagonally, with its angle turrets projecting to their full extent, it appears at first sight to be somewhat squat, at least in comparison with most modern work; but this very squatness, which the vigorous visible entasis accentuates, gives the spectator the idea that the spire is a stone one, and not only that, but that it is built up of comparatively small blocks of stone—a truthful expression which most modern stone spires do not convey. The parapet is pierced with quatrefoils and bears the arms of Archbishop Lauder.

In spite of the fact that the north wall of the nave leans outwards, and that the south-east corner of the choir is considerably off the plumb, the cathedral as a whole has a very substantial appearance. There is a solidity and sturdiness about it which extends itself even to the top of the spire. This is, no doubt, the feeling which Sir Walter Scott had when he makes Andrew Fairservice in "Rob Roy" exclaim, "Ah! it's a brave kirk—nane o'yer whigmaleeries and curliewurlies and open steek hems aboot it, a' solid, weel jointed mason wark that will stand as lang as the warld, keep han's and gunpowther aff it."

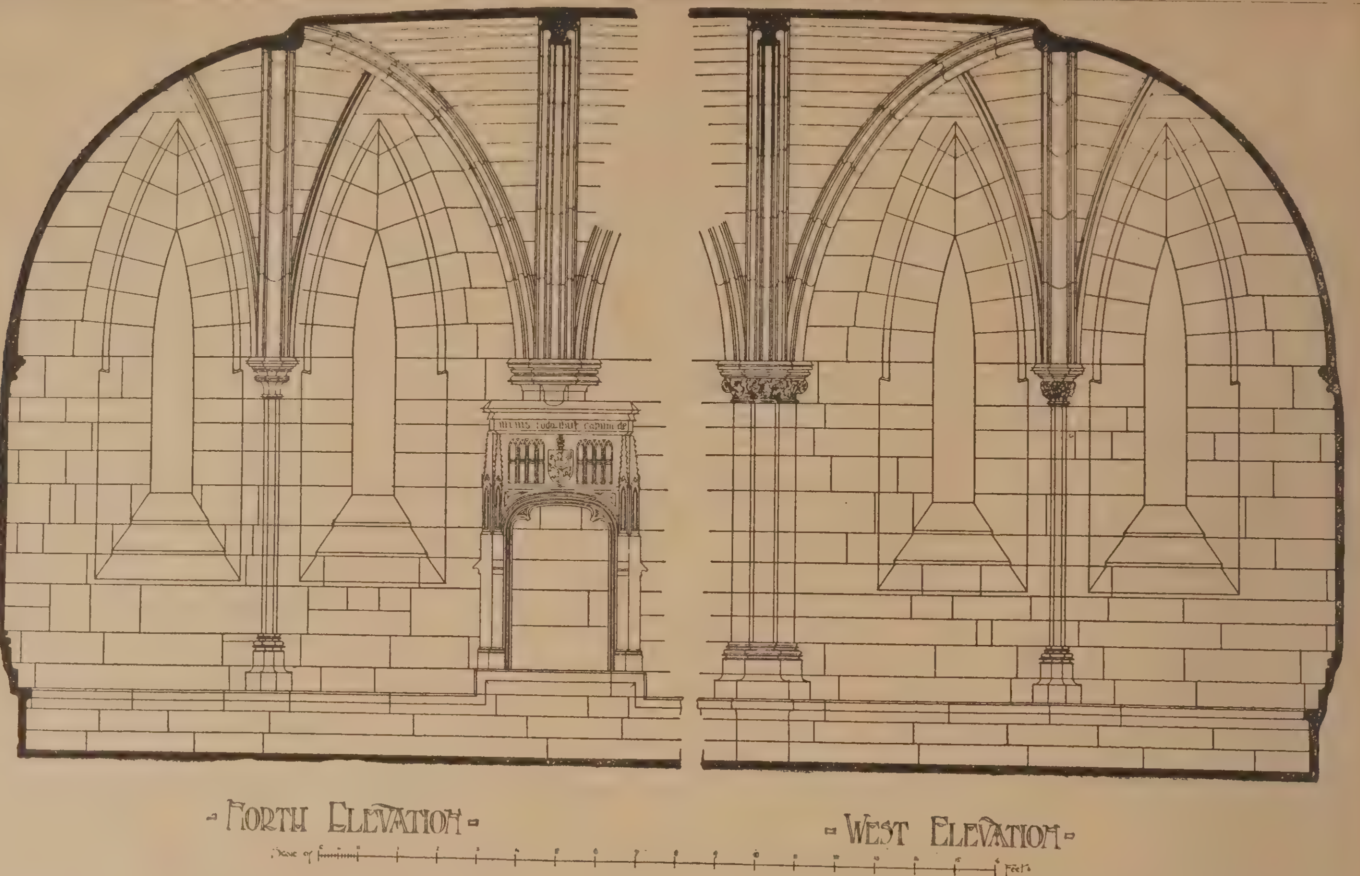
The usual entrance to the cathedral is obtained through the south doorway to the nave. This is not, strictly speaking, a porch, but the nave wall is thickened and the doorway deeply recessed. Above, there is a circular window with tracery similar to that of the other windows of the south aisle, and the buttresses at each side of the door are adorned and enriched with projecting canopied niches of the "early pointed type." The design of the whole is very effective.

The great western doorway is a fine, delicate and dignified, though extremely simple, double doorway. This doorway, however, is unfortunately seldom if ever used, entrance being gained to the cathedral, as already stated, by the door in the south aisle of the nave. This to some extent gives a bad impression of the cathedral; for if we enter by this doorway instead of seeing the full length of the nave and choir, we only see the nave piers opposite, and when we step into the centre of the nave we do not get the same long perspective view as we would have obtained had we entered by the west door; and as the average visitor never thinks of surveying the cathedral from that point of view he thus misses one of the finest impressions of it.

On entering the cathedral one of the first things that strikes one is the bare and empty not to say useless appearance of the nave. It is architecturally plain and simple, there being no carving with the exception of the little leaf at the intersection of the hoodmoulds of the



CHAPTER-HOUSE, GLASGOW CATHEDRAL: PLAN LOOKING EAST. MEASURED AND DRAWN BY ALEXANDER T. HEATHCOTE.



CHAPTER-HOUSE, GLASGOW CATHEDRAL: DETAIL OF NORTH-WEST BAY. MEASURED AND DRAWN BY ALEXANDER T. HEATHCOTE.

nave arches, and this plainness is accentuated and rendered almost painful by the fact that there are no fittings and that it is unseated.*

Surely this state of matters ought to be remedied by the inhabitants of the city which boasts of being the second in the empire.

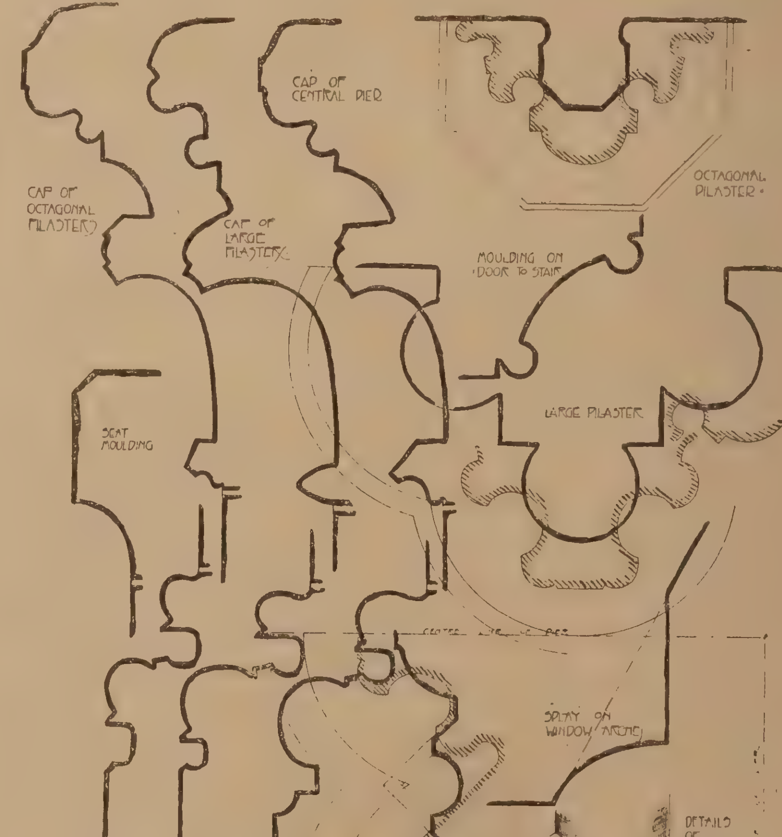
The nave, arches, triforium and clearstory are fairly well proportioned, but the effect is somewhat marred by the want of a good roof (the present roof is one of the "renovations" of Blore) and also by the fact that the shaft from the roof stops on a corbel at the triforium string course instead of running to the floor. On the whole, however, the effect of the nave is interesting as showing what can be done in even a cathedral without the use of carving.

(*To be concluded.*)

STRAIGHTENING A CHIMNEY STACK.

THE work of bringing back to the perpendicular one of Messrs. John Lysaght's stacks at Bristol was begun the week before last.

Built of brick, in substantial proportions, the chimney has done duty for about twelve years, and is amongst the prominent landmarks of St. Philip's Marsh; but during the last two or three years it has developed a list, the summit having at length gone about 5ft. out of the perpendicular. The trouble was occasioned at the foundations, which extend about 10ft. or 15ft. underground and are embedded in masonry fixed on piles. Reaching a height of about 175ft., the chimney has a diameter of 15ft. at the base, and it tapers slightly, being reduced in width about a yard at the top, where it is fitted with ironwork weighing 4 tons. Its walls have a thickness of about 4ft. The onerous task of remedying the existing defect was entrusted to a firm of specialists—Messrs. W. J. Whitehead & Co., of 82, Queen's Road, Liverpool, who have given particular attention to the straightening of chimneys. They have carried out exacting work at dizzy heights in such huge chimneys as that of the Weston Works, near Runcorn, which is no less than 330ft. high, and on Murphy's Vauxhall chimney at Liverpool, which, 310ft. high, dwarfs a number of neighbouring stacks; whilst the firm have



CHAPTER-HOUSE, GLASGOW CATHEDRAL: DETAILS.

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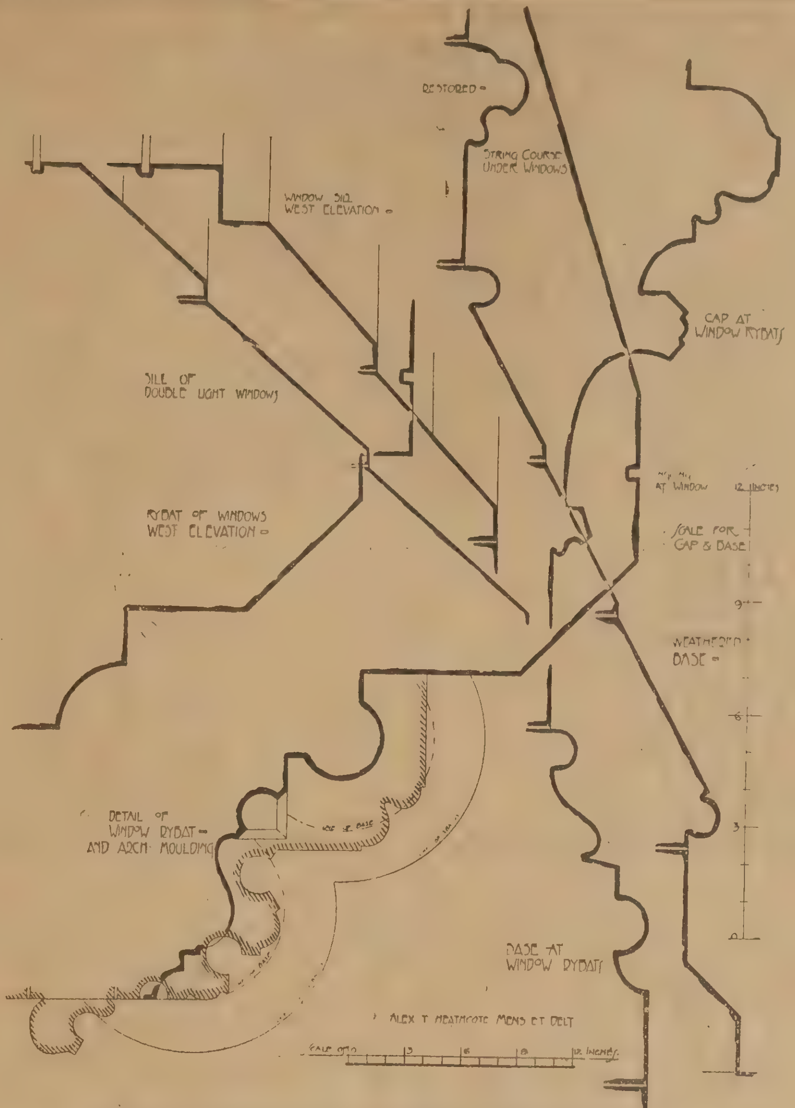
* I am glad to be able to say that since this was written it has been proposed that the nave be seated with chairs.

established a record by laddering a chimney of 450ft. high in 11½ hours, such a work usually occupying a fortnight. The chimney was that of the United Alkali Co. at Glasgow.

There are preliminary measures to be taken, there is overhauling to be done and care is taken not to precipitate anything even approaching an inelegant and risky wobble of the chimney. Thus it is that, first of all, a series of ladders, each 15ft. long, are secured against the wall of the chimney from bottom to top, and at Messrs. Lysaght's they were fixed on the side to which the structure inclined. The sections fit into sockets, and each is fitted in position by irons driven into the wall, so that the ascent of the chimney may be made at the outset. The arrangement of the ladders is on a plan which Mr. Whitehead has made specially his own. Next two stout iron bands are bolted around the chimney, about 2ft. apart—the lower band being about a yard from the ground—and it is within this space that the whole of the cutting and wedging take place. With chisel and hammer bricks are chipped away in a thin line on what may be termed the outer side of the chimney—that is, the side from which the stack has fallen out of the perpendicular—and supports are introduced into the gaps, whilst on the opposite side of the chimney broad wedges are driven into the wall. As the aperture broadens on the outerside constant play has to be made with wedges and other material to prevent jamming, and on the opposite side of the chimney the wedges continue to be driven home with further force, everything being at the same time kept fairly taut so that there may be no fear of excessive oscillation. So the process goes on, occupying some days, and Mr. Whitehead makes a point of always being on the scene until the task of straightening the chimney is safely accomplished.

Wolverhampton Municipal Buildings.—The Wolverhampton Town Council propose to extend and improve the municipal buildings. The present town hall was open in 1871, but owing to the rapid growth of the town and the gradual development of its municipal undertakings the buildings is now quite inadequate to meet the Corporation requirements. A scheme has been prepared by Mr. F. T. Beck, who estimates the cost at carrying it into effect at £14,314.


RESTORED
STRING COURSE UNDER WINDOWS
WINDOW SILL WEST ELEVATION
CAP AT WINDOW RYBATS
SILL OF DOUBLE LIGHT WINDOWS
AT WINDOW
12 INCHES
SCALE FOR CAP & BASE
RYBAT OF WINDOWS WEST ELEVATION
9
WEATHERED BASE
6
3
0
DETAIL OF WINDOW RYBAT AND ARCH MOULDING
BASE AT WINDOW RYBATS
ALEX T HEATHCOTE MENS ET DELT
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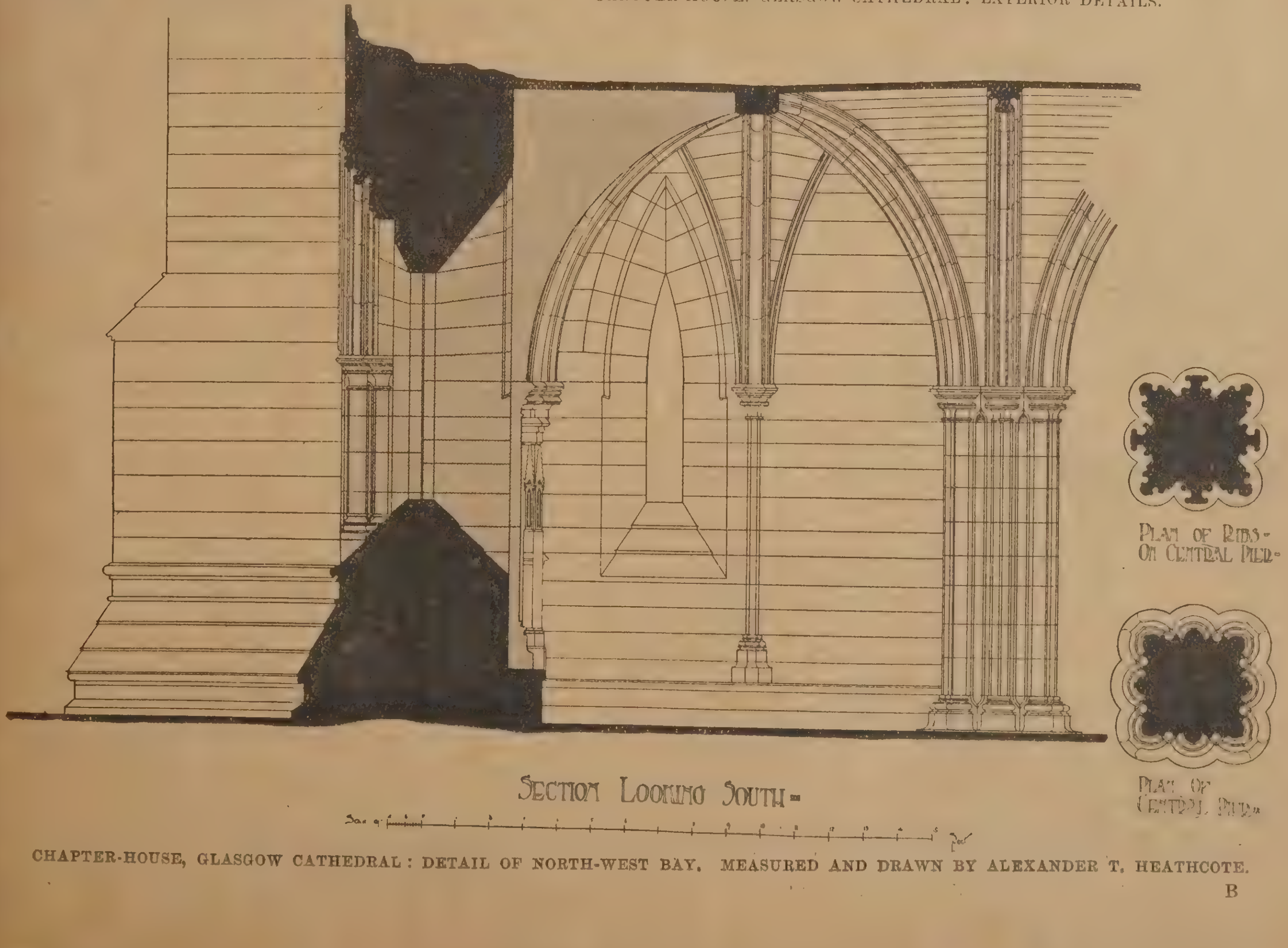
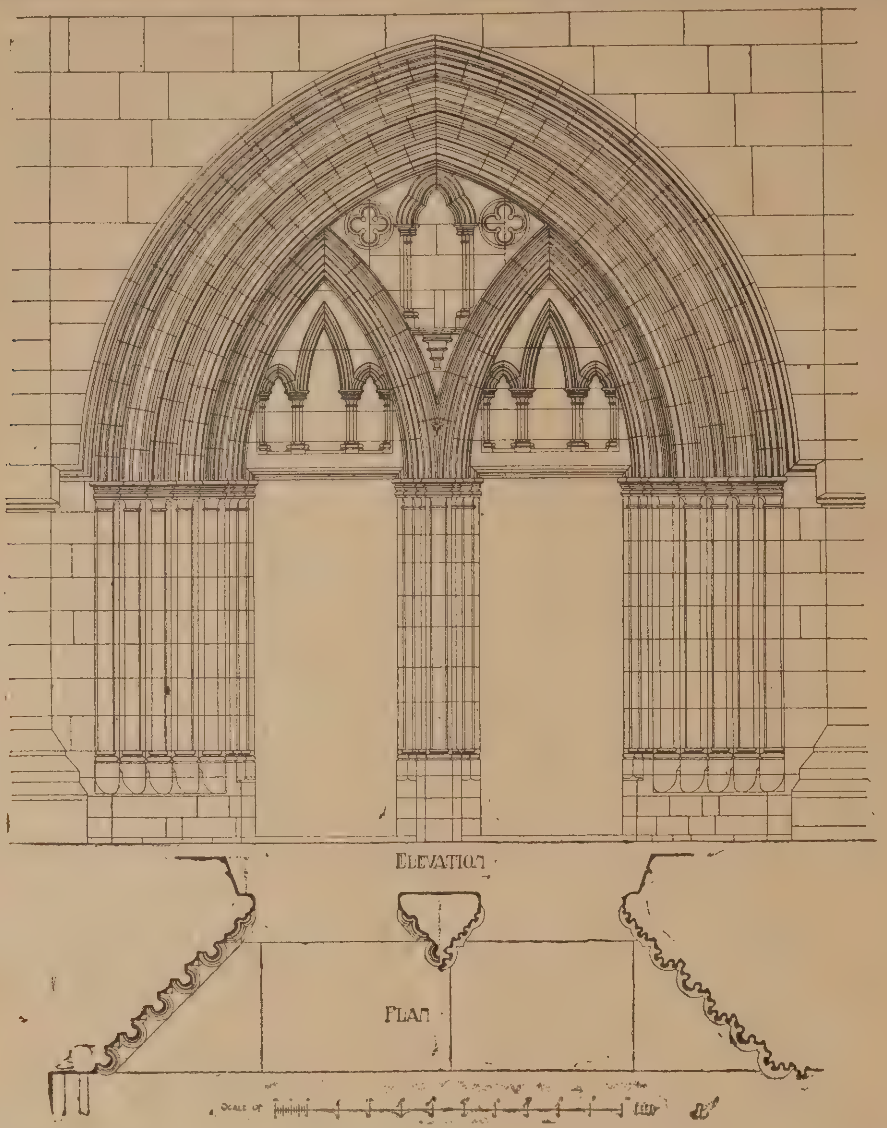
CHAPTER-HOUSE, GLASGOW CATHEDRAL: EXTERIOR DETAILS.



CHAPTER-HOUSE, GLASGOW CATHEDRAL: DETAIL OF NORTH-WEST BAY. MEASURED AND DRAWN BY ALEXANDER T. HEATHCOTE.



WESTERN DOORWAY, GLASGOW CATHEDRAL. MEASURED AND DRAWN BY R. M. MCKISSOCK.

WELBECK ABBEY.

Last Saturday week the members of the York Architectural Society visited Welbeck Abbey by char-à-banc from Worksop. The park was entered by the imposing gateway to the Bolsover Drive, which has been made through a pleasant wood of lofty Spanish chestnut, fir and other trees. In front of the mansion the party were met by Mr. J. Wallace Stevens, an old member of the York society, who conducted them over the grounds. The mansion facade consists of a series of gables in striking contrast to the later addition of an extensive Italian wing. The latter, unfortunately, has been greatly damaged by fire, but is now in course of reconstruction. A small ornamental garden with centrepiece is receiving an addition of an alcove at the side. Passing along the exterior of the latest addition from the designs of Mr. H. Wilson, and noticing a clock dial showing the month and day of the week, the party proceeded under an archway and entered the house. The entrance hall is richly furnished, the walls panelled, overmantel sculptured, with the family arms, and ceiling with ornamental plaster. The Gothic room has a fan-traceried vaulted ceiling; on a table stands a model of the horse St. Simon. Another apartment had overmantel and mirrors of Chippendale character. In the drawing-room is a bust of the late Queen Victoria. There are several paintings by Vandyck, amongst which is a full-length figure of the Earl of Strafford, who at one time occupied the King's Manor at York. Over the doorway is a portrait of Archbishop Laud. There are some interesting miniatures of Queen Elizabeth, Mary Queen of Scots, &c., magnificent cabinets, inlaid tables, and model of the ship that brought King William III. to England. The doors in all these rooms are polished. In another apartment were portraits of Queen Elizabeth and King Edward VI., and a large red jewel case of Queen Mary, wife of William III.

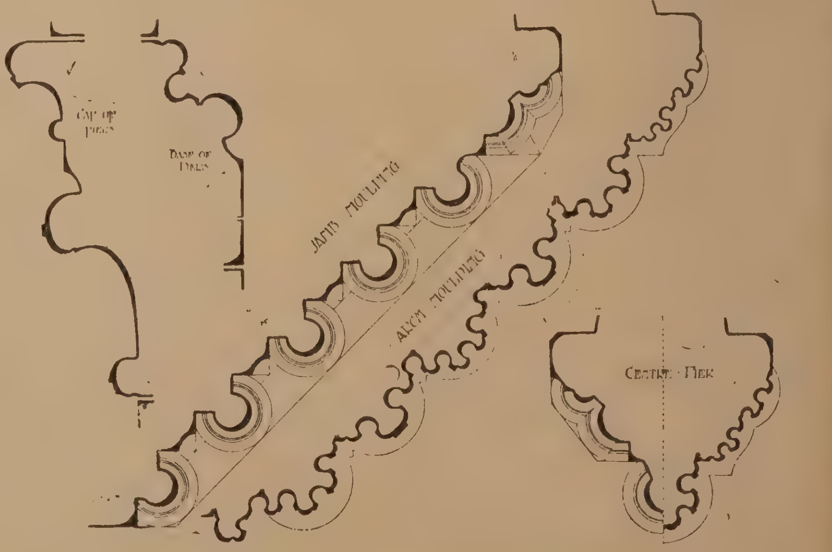
The old school of architectural design was now left for the new school of to-day. The recent additions designed by Mr. H. Wilson came in for a good deal of attention. The library consists of several apartments; it has a plaster ceiling following the rake of roof and cutting across same, enriched with flat ornament and circular panels depicting the zodiac, &c. The tall entrance arch and that to Ingle Nook is of rouge marble. Near the latter is a bust of William, Emperor of Germany. The chapel consists of centre and sides separated by columns supporting an entablature. The oak seats have carved subjects and carved texts from the Scriptures. The lectern of metal is an imposing object. The altar frontal is a metal one with large subject panel in relief.

The print gallery contains a valuable collection of prints of old Roman buildings, &c. The picture gallery, known as Underground, was now visited. It is 159ft. long by 63ft. wide. In it is a cabinet, the "Green Dale Oak," constructed out of that tree, and having subject panels relating to its history. The kitchens were then seen; these are the oldest portions of the house, occupying the vaulted undercroft of the abbey buildings, and are of the time of Henry II.; the doorways are of the usual transitional character. The kitchen being so far from the dining-room, a tram line connects them.

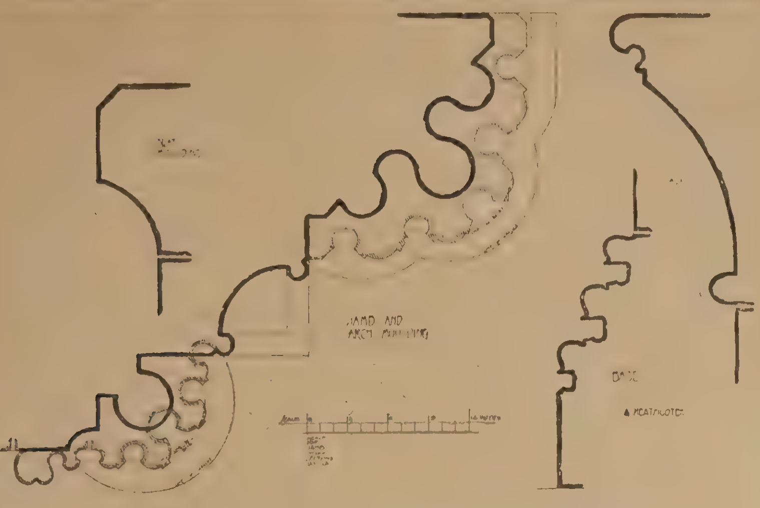
The house was now left for the riding school, 400ft. long by 100ft. wide. It has a wide centre, covered by curved iron and glass roof, with side aisles. A drive was now taken to Belf, where Mr. Stevens entertained the party to tea, at the conclusion of which Mr. Channon, F.R.I.B.A., moved a vote of thanks to Mr. Stevens for his valuable services, which was carried with acclamation.

Law Cases.

Fire-resisting Construction between Trade and Private Premises.—The case of *Dicksee* v. *Hoskins* came in the Court of Appeal last week before the Master of the Rolls, Lord Justice Vaughan Williams and Lord Justice Stirling. This was an appeal from the judgment of a Divisional Court, the Lord Chief Justice and Mr. Justice Lawrance, on a special case stated by a Metropolitan police magistrate on allowing an appeal under the London Building Act, 1894, from a notice of objection to a proposed building served by the appellant, who was a district surveyor under the Act, upon the respondent who was a builder. The case was reported on p. 248 of our last issue for May 1st last. The question was whether the proposed building was one to which section 74, subsection 2, of the London Building Act applied. That subsection provides as follows: "In every building exceeding ten squares in area used in part for purposes of trade or manufacture and in part as a dwelling-house the part used for purposes of trade or manufacture shall be separated from the part used as a dwelling-house by walls and floors constructed of fire-resisting materials." The proposed building was the re-erection of an old beer-house. It would, when built, exceed ten squares in area, and was intended to contain—in the basement, beer and wine cellars; on the



WESTERN DOORWAY, GLASGOW CATHEDRAL. MEASURED AND DRAWN BY R. M. MCKISSOCK.



DOORWAY, CHAPTER-HOUSE, GLASGOW CATHEDRAL.

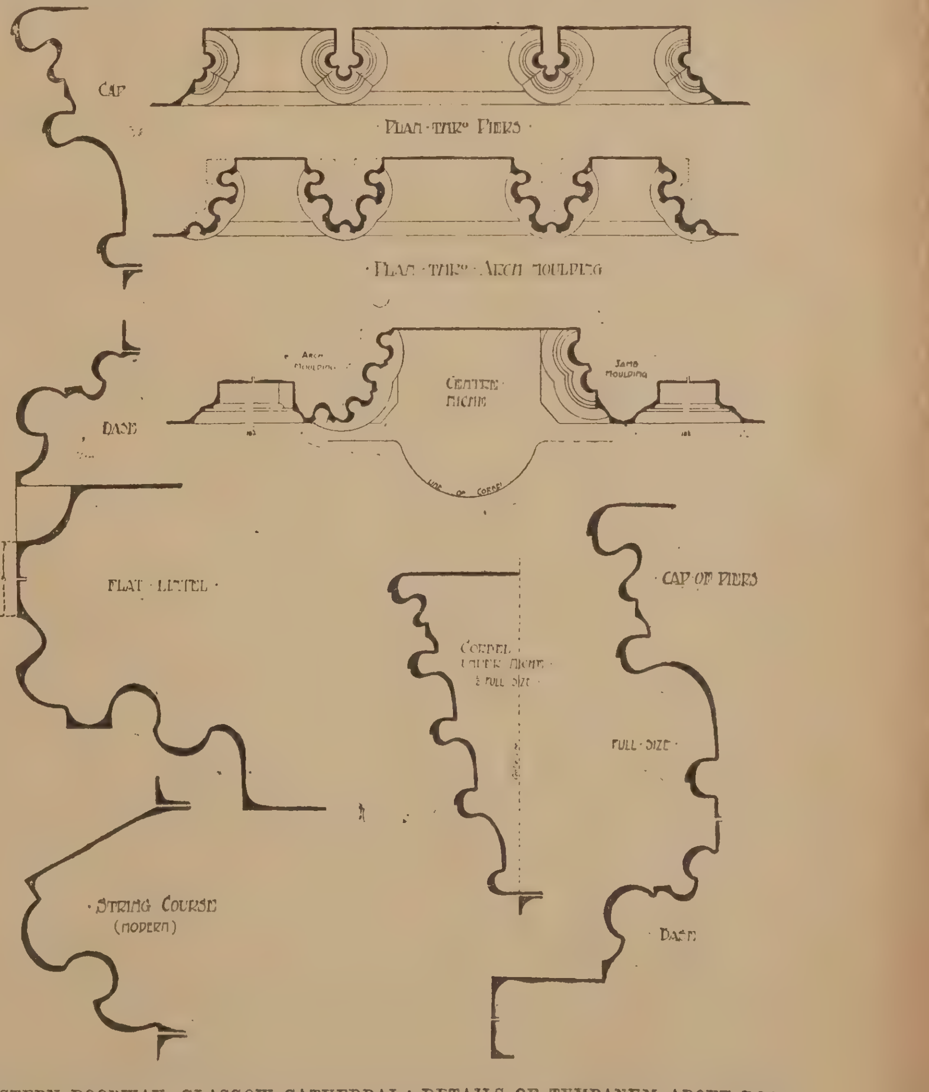
ground floor, a bar, public lobby, saloon bar, private bar, parlour and a public room; on the first floor, a sitting-room, three bedrooms and a kitchen; and on the top floor, attics. It was intended to be licensed and used for the sale of wine and beer to be consumed on or off the premises under the Beerhouse Act, 1830, and the Refreshment-house Act, 1860. The trade of the beerhouse was to be carried on on the basement and ground floor, and the licensee and his family were to reside in the upper floors of the building. The whole of the building was to be covered by the justices' certificate and Excise license. The floors separating the ground floor from the first floor and the staircase leading to the first floor were not intended to be constructed of fire-resisting materials, and the learned magistrate found that, if sub-section 2 of section 74 of the London Building Act applied to the building, the provisions of that section would be contravened. The learned magistrate also found as a fact that the basement and ground floor of the building were intended to be used for the purposes of the trade of a beerhouse, and that the part above the ground floor was intended to be used as a dwelling-house for the licensed occupier, but held that the case was governed by the decision in *Carritt* v. *Godson* (1899, 2 Q.B., 193), and allowed the appeal and overruled the objection of the district surveyor. The district surveyor appealed to the Divisional Court, and they dismissed the appeal. He now appealed to the Court of Appeal. The Court allowed the appeal. The Master of the Rolls said that, personally, he did not agree with the findings of fact found by the learned magistrate, but he was bound by them. The magistrate seemed to him to be inconsistent in finding as he had done and also holding that the case was governed by *Carritt* v. *Godson*. But accepting the findings, it followed of necessity that the appeal must be allowed. Lord Justice Vaughan Williams said he concurred reluctantly. Lord Justice Stirling also concurred.

A Blackpool Solicitor's Building Transactions.—The case of *Morgan and others* v. *Todd* came before the Court of Chancery of Lancashire last week. This was an action brought by the trustees of the late Thomas Thomas, a builder, of Blackpool, and by Young Willie Thomas and Matthew Eden, also builders, of Blackpool, against James Todd, chartered accountant, of Preston, the trustee in bankruptcy of Arthur Kay, a solicitor formerly practising in Blackpool, who absconded about the end of 1898, for the purpose of establishing a partnership between the plaintiffs and Kay in the purchase and development of a large plot of building land in Dickson Road, Blackpool, on which some twenty-one houses and two shops were erected. Counsel for the plaintiffs informed the Vice-Chancellor that the case had been settled upon the terms that the defendants should pay the plaintiffs a sum of £315 and their costs of the action, and that this should be in settlement of all claims by the plaintiffs against the defendant or the defendant against the plaintiffs. Counsel for the defendants said that Mr. Todd had received a certain sum from the sale of part of the property, and the amount mentioned by Mr. Mansfield would be paid out of that sum. An order was made accordingly.

Wages due from a Builder.—At the Chelmsford County Court, before Judge Tindal Atkinson last week, James Strowger, carpenter, Broomfield, sued Myer Cohen, builder, Beach Road, Dovercourt, on a judgment summons for £7 18s. 11d. for wages due. Plaintiff stated that defendant carried on business as a builder at Dovercourt; he believed defendant had now four houses in course of construction there; plaintiff also believed defendant had bought land, and that he employed about ten men. Defendant said he was a builder until about nine months ago, but he had been sold up by the sheriff. There were a lot of judgment summons against him, but he was trying to pay all his debts, and was willing to pay plaintiff 10s. a month. He was superintending the erection of some houses at Dovercourt for his mother, and was making about 30s. a week. His Honour made a fresh order for the defendant to pay 10s. a month.

Workmen's Compensation.—At the West Bromwich County Court last week an interesting case under the Workmen's Compensation Act of 1897 was heard. The executors of Ezra Hadley, deceased, brickmakers, of Round's Green, Oldbury, brought an action to set aside an arbitration award granted to Samuel Yates, of Summer House, Round's Green, in respect of an injury he sustained at the applicants' works on the December 13th, 1899. An award was made on July 18th, 1900, under which the respondent received 14s. a week. The applicants now offered the respondent a situation and contended that the compensation was excessive, adducing evidence to show that he was in a fit state to perform certain work. Drs. Buttery and Martin Young, however, deposed that Yates was now in a worse state than when the award was made. The judge, in summing up, said he had never heard a more utterly hopeless application to set aside an award. He complained that the applicants' manager had attempted to coerce the respondent, and he characterised his conduct in the matter as highly improper. The application would be refused.

Earl Carrington and Building By-laws.—Earl Carrington, who has lately developed his estate in the vicinity of High Wycombe for building purposes, was summoned last week by the town council of that borough for breaches of the by-laws. Two summonses charged him with making roads of insufficient width and one with failing to deposit a plan. The hearing lasted six



WESTERN DOORWAY, GLASGOW CATHEDRAL: DETAILS OF TYMPANUM ABOVE DOOR. MEASURED AND DRAWN BY R. M. MCKISSOCK.

hours, at the end of which two summonses were dismissed, with costs against the Corporation, the defence being that the streets were made in accordance with an old by-law. The third summons was withdrawn. Earl Carrington, who was present, refused to take his costs, but asked the prosecution to accept the decision of the Bench as final. Counsel for the Corporation, however, resolved to appeal against the decision.

St. Leonards Architects' Claim.—In the Sussex County Court recently Messrs. Piggott & Oxley sued Mr. Meads and others to recover fees for services rendered in preparing plans and quantities, getting out tenders, and work generally, the amount claimed being £85 15s. 3d. The case was heard by a common jury. Mr. Charles Archer Piggott, of Saxon Chambers, St. Leonards-on-Sea, architect, said in the year 1898 he met defendant Meads, who asked witness if he could have one of the plots. Witness said he would try to arrange it, and Mr. Meads entered into a building agreement with the owner on January 17th, 1898. In the latter part of the year witness met Mr. Meads and a conversation took place with regard to the plans and drawings of a villa. On October 31st, 1898, Mr. Meads came to his office and brought with him a rough sketch. The cost was to be £1,200. Witness looked at the sketch and said it would be impossible. Mr. Meads asked witness to get out a proper sketch. Witness did so. Mr. Meads wrote to witness on November 6th, 1898 saying, "I think the plan will do very well." On November 7th, 1898, Mr. Meads came to witness's office with the plan. Witness showed him a proper drawing, saying defendant could not possibly expect the villa to be erected for the sum named, £1,200. Witness then got out quantities and prepared specifications, sent them to London, and issued them to various builders, and obtained various tenders. On December 13th, 1898, witness received some tenders, and opened them in the presence of Mr. Meads. The lowest was for over £2,000. Defendant said he was not prepared to pay so much money, and asked witness to reduce the plans and alter the style of the work and material so as to get it down as low as possible. Witness told him he thought they might reduce it to £1,600. Witness received a letter from Mr. Meads on December 14th, in which he stated he had talked the matter over with Mrs. Meads and she was willing for certain alterations to be made. On January 17th witness saw Mr. Hatton, who had submitted the lowest tender, and Mr. Hatton arranged to carry out the work. Defendant would not allow witness to reduce the size of the rooms. On April 17th, 1899, witness sent in his account to the defendant with particulars. On December 19th Mr. Meads asked for a month to pay. At the end of the month witness sent in his account, and subsequently put the matter into the hands of his solicitors. His charges were fair and reasonable. Cross-examined, witness said that originally the price was not to be more than £1,200, but it was not correct that this price was adhered to all along; Mr. Meads said he wanted expenses kept as low as possible. Mr. Oxley, one of the plaintiffs, bore out the evidence given by his partner, Mr. Pigott, as to interviews when Mr. Meads brought the sketch and returned the plans. Mr. William Meads, a dentist, of Bexhill-by-Sea, said he had to pay just over £700 for the freehold. Witness asked Mr. Pigott what he could have a house built for, who said for any sum. Witness said he did not want to spend more than £1,000. Witness got out a rough sketch, and Mr. Pigott thought it would do very well with a slight alteration. Neither Mr. Pigott nor his partner suggested that the building would cost more. Witness afterwards said, "Keep as near as you can to £1,000; only don't go over £1,200." Mr. Pigott said, "Very well." On the night before the tenders were sent out witness had a special interview with Mr. Oxley and asked him if they had everything down. Mr. Oxley said he thought so. Afterwards witness said he could not be quite certain whether they could get it for their £1,000, but he thought they were well within the mark. Defendant said that that being so he was willing to go forward, but he would not undertake it if there was any doubt. Mr. Oxley again said he thought they were well within the mark. Witness was dumbfounded on receipt of the tenders. Witness said on several occasions that if Mr. Pigott could not reduce the amount to £1,200 he would not go on. At this stage the case was stopped by his lordship and judgment given for the plaintiffs for the amount claimed.

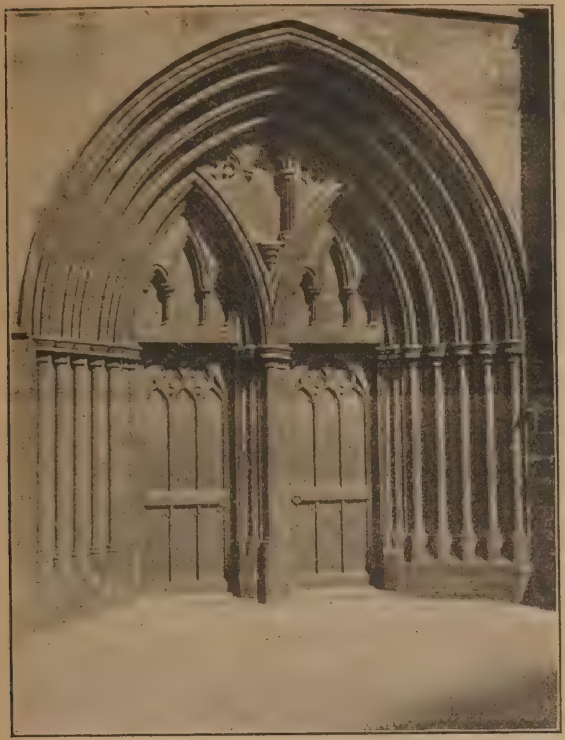
TOWER AND SPIRE, GLASGOW CATHEDRAL.

Workmen's Compensation: Height Measured from the Footings to Ridge.—At the Bromley County Court Judge Emden recently decided the case of *Edwards* v. *Botting*, in which the plaintiff, William Edwards, a carpenter and joiner of Sidcup, claimed £13 compensation from the defendants, Mr. and Mrs. Botting, in respect to a fractured wrist which he sustained while at work on their new house, America Villa, Sidcup. Mr. Chester Jones, instructed by the solicitors to the Society of Carpenters and Joiners, was for the applicant, and Mr. George Weller for the respondents. Mr. Chester Jones said that the applicant claimed for thirteen weeks at £1 a week, which was the limit allowed by the Act, for injuries resulting from a fall of some 10ft. while at work on the respondents' building on January 21st of the present year. He was incapacitated for fifteen weeks but the Act allowed no claim to be made until the expiration of a fortnight. On the day in question the applicant was putting down the flooring around the well-hole of the staircase, and as no cramps had been supplied he was using a board as a strut, and this board gave way, letting him down and fracturing his wrist. The only material objection of the respondents seemed to be that the building was not more than 30ft. high. If the applicant was entitled to take the footings into consideration in considering the height of the building, then the building would would be 30ft. 6in. high. If not, it would be 9in. lower. In the case of *Hoddinott* v. *Newton Chambers*, which went to the House of Lords, it was laid down that the ridge of the roof could be included in the measurement, but the Master of the Rolls declined to say anything as to the measurements underground, as it was unnecessary to do so. Therefore the question was left open. The only judicial announcement was one by Judge Parry, of the Manchester County Court, reported in the "Law Times" of March 9th, vol. 110, p. 431, who ruled most decidedly that the footings should be included in the measurements. His Honour said that Judge Parry did not go so far as at first appeared. He excluded the foundations, but said he should measure from the lowest brick. Mr. Robert Thomas Brown, surveyor, of 1, Gray's Inn Place, London, produced a plan of the building which he had made from measurements on June 13th. The height from the footings, inclusive, was 30ft. 6in.; excluding the footings, it was 6in. less. In many places the footings were exposed. For the defence, Mr. Botting was called and stated that he had measured the building as it was on the day of the accident, and from the ridge in the roof to the damp course was 29ft. 2½in. He did not include the height of the ridge-tile, for that was not on at the time of the accident. Mr. Robert A. Jack, M.S.A., said he measured the house. From the top of the footings to the underside of the slate-batten nearest to the top of the ridge-piece was 29ft. ½in. The slate-batten was fixed close to the ridge-piece, and it was impossible to measure the exact height to the top of the ridge-piece without removing the slate-batten and the tile. His Honour said that such points as these illustrated the shockingly loose wording of this Act. Witness, continuing, said the height to the top of the ridge-tile from the top of the footings was 29ft. 9¾in. If they added two courses of brickwork for the footings that would make 30ft. 3¾in. Mr. Chester Jones said that the fact that he measured from the height of the ridge-tile from a drawing supplied by Mr. Botting probably accounted for the difference of 3in. William Edwards, the applicant, in reply to his Honour, said he was not absolutely certain, but he believed the tile was on at the time of the accident. There was scaffolding all round the building. The judge said the whole question turned on the question of the ridge-tile. The respondent Botting was then re-called, and examined, and he was very positive as to the ridge-tile not being on; but in reply to the judge admitted that he went by his wages-book and the fact that the duck ladders were on the roof. He could not give the names of the men who put the tile on. They were from Deptford and were engaged casually. He had made no effort to call them. His Honour, in giving judgment, said that as to the building, he was going to apply ordinary common-sense in dealing with it. First of all, as to the ridge-tile. There was great uncertainty as to whether it was on or not. But he must decide one way or other, and he would hold that it was on for this reason: that the respondent was fully able, if he so desired, to bring proper evidence on the point which he knew he was going to raise, and which the applicant knew nothing of. But he deliberately abstained from doing that. Then as to the height, he would hold that directly the first brick was laid the building commenced to be erected, and therefore the height must include the footings, which made it 30ft. 6in. His judgment would therefore be for the amount claimed, viz., £13. Eventually costs were allowed on Scale B.

Surveying and Sanitary Notes.

Sanitary Conveniences for Manchester.—A Local Government Board enquiry was held recently into the application by the Manchester Corporation for sanction to borrow £3,380 for the purchase of land at Moston to be used as a public recreation ground, and £21,000 for the erection of public sanitary conveniences in different parts of the city. There was no opposition to either application.

The Strand Improvement.—At Bow Street Police Court last week the London County Council applied to Sir F. Lushington to appoint a surveyor to value various premises situated between New Church Court, Strand, and the Law Courts. The buildings in question are to be pulled down in consequence of the Strand improvement scheme, and the Council has been unable to agree with the parties interested as to the amount of purchase-money. The magistrate agreed to appoint Mr. Guy, surveyor, of Bedford Row. The Council will obtain possession by paying the money into Court in accordance with his valuation.



WESTERN DOORWAY, GLASGOW CATHEDRAL. PHOTOGRAPH BY A. G. HENDERSON.

WEST LONDON ELECTRIC TRAMWAYS.

THE formal opening of over 15 miles of electric tramway line laid down by the London United Tramways Company in West London took place last week. Electric tramcars have been running between Hammersmith and Kew Bridge, Shepherd's Bush and Acton, and Shepherd's Bush and Young's Corner (about 7½ miles in all) since before Easter, while a further section of three miles from Kew Bridge through Brentford to Hounslow was brought into operation last Saturday week. The extension from Acton to Southall was the only part that had not been used for public traffic previous to the formal opening. It has a special interest for two reasons. First, because two miles of it are technically a light railway, though there is not the slightest difference to outward view between this "light railway" and the other three miles, which are an ordinary tramway; and, secondly, because its lines were laid in an extraordinarily short time—at the rate of almost a mile of track in a week. But these 15 miles represent only a fraction of the system which the company hopes it will be working in a few years. Already it has obtained authorisation to lay extensions to Uxbridge in the west and to Hampton Court in the south, which will bring up the total mileage to 40, while other proposed new lines—some 15 miles of which have already received the sanction of the House of Commons—amount to another 40 and run as far afield as the Maldens, Thames Ditton and Kempton Park. Over all these lines the ordinary fares charged average about ½d. a mile, with workmen's fares at half that rate, and the extent of the traffic that it will be possible to accommodate may be imagined from the fact that on Whit-Monday, on only 7½ miles of line, 210,657 passengers were conveyed.

The central station, where is generated the electrical energy required to work all these lines—constructed and projected—stands in the Chiswick High Road, alongside the Hammersmith Station of the North and South Junction Railway, and is claimed to be one of the finest of its kind in the country. The building, which contains the boilers and engines, is of red bricks, with freestone dressings and ornaments; it has a frontage of 154ft., with a depth of 102ft. Internally, it is divided into two portions—the engine-room and the boiler-house. The interior walls are faced with white enamel tiles and its floor paved with mosaic. To the right on entering, the end of the room is filled with a low gallery on which are mounted the switches by which all the different sections of the line are controlled. High overhead is a 25-ton travelling crane, worked by three electric motors. Down the middle are arranged the main engines and generators—now three in number, but soon to be increased to five. Each of them is apparently quite isolated, and there is an almost complete absence of the usual paraphernalia of steam-pipes—too frequently with steam-hissing from imperfect valves—for all the connecting-pipes, &c., are brought up through the floor from the basement below. Each engine stands 25ft. high, and the fly-wheel, which revolves between the two inverted cylinders thrice in every two seconds, is 20ft. in diameter and weighs 36 tons. All the engines are compound, the steam-pressure at the throttle-valve being 150lb. to the sq. in. The first two have two distinct continuous-current generators mounted on their shafts, one on each side of the fly-wheel, and each with a capacity of 250 kilowatts at about 500 volts. These are used to supply current to the lines in the vicinity of the station. For the more outlying portions of the system the third machine is employed—a 500 kilowatt three-phase alternator, yielding a current at 5,000 volts, which is transformed down at the sub-stations at Hanwell and Hounslow and distributed to the lines near them as a continuous current with a voltage of 500. The two last machines, which have yet to be installed, will be of the same character, but of two or three times the capacity. The engine-room also contains subsidiary machinery for various purposes—two boosters, a rotary converter, which may be used either to transform continuous current to alternating, or *vice versâ*, and therefore forms a stand-by to any one of the main machines, a couple of dynamos for supplying light and power to the offices and car-sheds, and condensing apparatus for the engines.

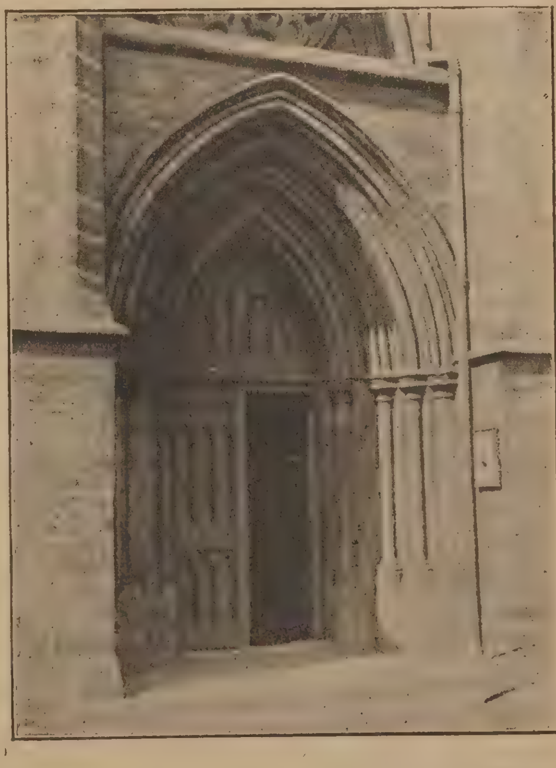
Behind the engine-room, and of equal length with it, though somewhat narrower, is the boiler-house, which contains five pairs of Babcock and Wilcox water-tube boilers, each pair capable of evaporating 22,000lb. of water per hour at a steam-pressure of 150lb. per sq. in. Coal is fed into the furnaces by automatic stokers driven by electric motors, and each pound as it comes down from the bunkers above the boilers is weighed by automatic apparatus. These bunkers are also filled automatically, the coal being carried up in a series of buckets fixed on a endless chain; these buckets automatically take their load from a receiving hopper, and automatically tip it out into the bunkers. The same conveyor also removes the ashes, the buckets running along the basement in front of the ash-pits and dumping the waste material into the receptacles provided for the purpose. Besides the coal-bunkers, the floor above the boilers contains two feed-water tanks, with a combined capacity of 12,000 gallons, and the flue, which is a steel shaft 6¼ft. wide and varying from 3ft. to 13½ft. in height. The smoke stack into which this discharges has some remarkable features. It is 260ft. high, and has an internal diameter at the top of 10ft. The upper portion (200ft.) is of uncommon construction, for it is made not of brick but of steel plates in rings, lap-jointed and riveted together, with a lining of firebrick. The foundations for this structure were carried down 28ft. to the blue clay, water being met with at from 8ft. to 10ft. from the ground. This water gave rise to some trouble while the concrete foundations were being put in, but it has compensatory advantages, for after passing through a softening apparatus it now forms the source of supply for the boilers.

To come to the tramway itself, the whole of the lines are equipped on the overhead trolly system, in which the current passes to the cars along an overhead copper wire, and after doing its work in the motors returns by the rails on which the car runs. This wire is usually supported from steel standards erected on each side of the road, but in some places—Ealing, for instance—central poles have been adopted. To prevent accidents from telephone wires breaking and falling on the trolly wire and so establishing a short circuit, these standards carry a system of guard wire. It is conceivable, of course, that these might break, or even the trolly wire itself give way, though that is not likely since it has a breaking stress of 5,000lb. But in neither of these contingencies would the public in the streets be exposed to the dangers of "live" wires, for the electrical arrangements are such that the moment a broken trolly wire, or a broken telephone wire in contact with it, touches the earth, the heavy current which would immediately pass throws over an automatic switch at the central station, whereby the current is entirely cut off from the section and the broken wire becomes "dead" and harmless. The entire route is divided into half-mile sections, and not only each section, but each trolly wire in each section, has its own separate feeder, so that it is possible to have an interruption in the electrical supply of one pair of rails without the other pair being affected. It may be mentioned here that the rails, which are of steel, are carefully connected with copper bonds so as to ensure as good electrical continuity as possible, and that they weigh more per yard (92½lb.) than those in use on many railways.

The cars which run in the electrical service are far superior at once in size, speed and accommodation to the horse-drawn vehicles they have displaced. Mounted on two four-wheeled bogie-trucks and propelled by two 25 h.p. motors, they can carry sixty-nine passengers.

In conclusion, it may be noted as an interesting fact that all the buildings, lines, &c., were designed and constructed by the company itself, without the intervention of contractors, the engines, dynamos, cars, &c., having been purchased from manufacturers on designs prepared by its own engineers.

A Bust of Marie Antoinette, the work of Pajou, dated 1774, and a statuette of Napoleon, both in Sèvres ware, have been presented to the Musée Carnavalet, Paris.



SOUTH PORCH TO NAVE. PHOTOGRAPH BY A. G. HENDERSON.

BUILDING CONTRACTS.[*]

BY H. H. RICHARDSON, Clement's Inn Prizeman, 1879.

THE term "building contract" may be applied to any legally-binding agreement which has for its subject matter, or principal subject matter, the erection of buildings or the execution of works of the nature of buildings, and, as generally used, it may be more particularly defined as an agreement by which one person, or body of persons, undertakes for a consideration to erect or construct for another buildings or other works of that nature.

The first necessity in the case of such a contract is, of course, that a site for the proposed buildings or works is to be provided; and as the usual occasion for a building contract is where the owner of a site desires to have it built upon, the term "building contract" is usually understood to import that the proposed buildings are to be erected upon the land of another for his use and benefit.

As the terms "contract" and "agreement," as commonly used, have essentially the same legal signification of a legally-binding agreement, that is to say, an agreement enforceable by law, so there is not, strictly speaking, any inherent or essential difference legally or grammatically between the terms "building contract" and "building agreement"; but, in fact, the former term has come to be used so as to import that the works to be done are to be done for the use and benefit of the owner of the land, whereas the term "building agreement" is usually confined to agreements providing for a grant to the builder of a lease of or other interest in the land upon completion of the building.

Although therefore either term may be applied to any agreement which provides for the erection of buildings, the term "building contract" naturally suggests to the experienced that the buildings are to be for the use and benefit of the building owner or employer, and consequently that the consideration is to be a money payment or something of the like nature, *e.g.*, payment in shares of a company; whereas the term "building agreement" suggests that the builder is to acquire in consideration of his building a lease of or other interest in the land built upon.

Instances of Contracts and Agreements.

As illustrations, a simple instance of a "building contract" would be where—

> A., a builder, agrees with B., a landowner, to build him a house upon his land, in consideration of a lamp sum to be paid on completion of the work.

And a similar instance of a "building agreement" would be where—

> A., a builder, agrees with B., a landowner, to build upon B.'s land in a specified manner, in consideration of B. granting to him a lease of the land and buildings.

The rent of such a lease is, of course, fixed at a sum considerably below the rack-rent of the property as built upon, and the amount expended in buildings is, in fact, equivalent to a premium paid for having the property as built upon at a rent below the rack-rent thereof. Although a contract to pull down a house comes within the Statute of Frauds as relating to an interest in land, and must be in writing, a contract to build a house does not.

Provisions.

In the case either of a building contract or building agreement, as above defined or distinguished, provisions will be found (1) on behalf of the landowner, (2) on behalf of the builder, and these are usually followed by provisions for the prevention or settlement of disputes which should be on behalf of both parties, but are in most cases found to be framed rather in the interest of the building owner or employer. The general object of the provisions on behalf of the building owner or employer is, putting it quite generally—

> (*a*) That the buildings to be erected shall be of the desired nature and quality, and be completed within a specified time.
>
> (*b*) That the builder shall not be entitled to his remuneration or consideration unless and until he has fulfilled his part of the bargain.

And the object of the provisions on behalf of the builder is—

> To put him into a position to claim his remuneration as soon as he has earned it under the stipulated terms.

Although these objects may be stated thus simply and shortly in a general way, the complicated nature of building operations and the many unforeseen occurrences which may intervene render numerous and elaborate precautions necessary for the prevention of disputes during the progress of, or after the completion or (it may be) the previous abandonment of the works. The provisions embodying these precautions have now settled down into a number of well recognised clauses, the more important of which are to be found in any well-drawn building contract or agreement. These more important clauses it is proposed presently to consider in detail, with special reference to the legal bearing and effect thereof and to certain judicial decisions thereon.

The subject of the present paper is building contracts in the ordinary sense as above distinguished, *i.e.*, contracts for the erection of buildings or construction of works on the land of another person for the use and benefit of that other person. It is in the case of building contracts in this sense, particularly, that the elaborate provisions to be presently considered are necessary in order to secure that the work shall be done in exact accordance with detailed requirements.

Value and Character of Buildings.

In the case of a building agreement, as an immediate lease or grant of the property is intended to be made to the builder, it is, as a rule, only necessary to provide that the buildings shall be sufficient to secure the intended rent and, perhaps, also to preserve the character of the neighbourhood. For these purposes it is generally sufficient to provide that the buildings shall be of not less than a certain value and shall have a more or less uniform character. The builder himself, having or being about to acquire an interest or estate in the property, may be relied upon to build so as to give the property a marketable value. Consequently, it is not usually found necessary in building agreements to go into any great details as to the buildings to be erected.

When, however, buildings are to be for the use and benefit of the building owner, his first and foremost care will be that the agreement shall be framed so as to secure his getting what he wants in every detail, and to secure this is, consequently, the main object of the provisions of the contract on behalf of the employer.

Ruskin's Houses.

Now if the buildings contemplated were nothing more than what Mr. Ruskin somewhere says is all that the ordinary British householder requires—namely, four brick walls and a drain pipe—the employer might possibly be able to decide for himself whether that desideratum were supplied, and the services of an architect or surveyor might be dispensed with. *Pace* Mr. Ruskin, however, and, fortunately for the profession of architects, our needs and aspirations in the matter of building are seldom so simple; and, moreover, it is not only the demand of increasing wealth and luxury, but the elaborate requirements of modern building Acts, which have to be met. Consequently building contracts are frequently required to provide for the proper execution of most extensive and costly works in accordance with most minute and detailed particulars. Hence the introduction into the contract or transaction of a third party in the person of the architect or surveyor of the building owner, whose duty it is to bring his expert knowledge to the assistance of the building owner as a guarantee that the work to be done shall be done in the way in which an expert knows it ought to be done. One of the most important things to be considered is, therefore,

The Position of the Architect or Surveyor,

both as regards the owner and the builder, and the nature of the authority, duties, rights and liabilities involved in that position.

Before proceeding to details, it is to be observed that, as in the case of all instruments where the salient provisions have settled down into recognised form, this has been the result of a gradual growth, faults and deficiencies being rectified and supplied as experience has shown such rectification and supplement to be necessary. The case of conditions of sale will readily occur as an example of this growth or development. In preparing these, particular provisions to meet such particular case are required and are inserted by the draftsman as his skill and experience dictate; but beyond these special provisions there will be found a number of general forms which experience and the results of judicial decisions have shown to be necessary or expedient in every case, if disputes are to be avoided.

General Form of Building Contract.

We come now to consider the general form which a building contract for the purposes and in the circumstances aforesaid has come to assume. In contracts for elaborate works, and especially in the kindred contracts usually known as engineering contracts, the instrument frequently commences with a series of definitions (—*a*) of persons, *e.g.*, building owner or employer, surveyor, engineer, clerks of works, &c.; and (*b*) things, *e.g.*, works, plant, drawings, schedule of prices, &c.

These, however, are rather matters of convenience and not of necessity, and need not be here considered.

For the reason before indicated—namely, that the employer, not usually being an expert, and so not being competent of himself to specify precisely what he requires or to see that what is supplied is such—he will in the first place have employed an architect to prepare the plans and specifications for the proposed buildings, and the builder or contractor will be required to undertake to build them in accordance with such plans and specifications, and under the direction and to the satisfaction of the architect. The contract thus sets out by defining the work to be done, namely, that shown by the plans and specifications, and by providing a guarantee that it shall be properly done by requiring it to be done to the satisfaction of the building owner's architect or surveyor.

Completion and Remuneration.

The question which naturally arises next is that as to the time for completion; and, consequently, the clause or clauses indicating the nature and extent of the work to be done is usually associated with or followed by provisions for securing completion within due time and fixing the damages or penalties in default.

Next will naturally follow the question of the consideration or remuneration for the work with provisions as to the time, manner and conditions of its payment. Then, in order to prevent undue rigidity, will follow provisions as to alterations and deviations.

It will then be found convenient to provide as far as possible for all matters or contingencies which, or the consequences of which might if left unprovided for, give rise to dispute or doubt, and of these the following may be here mentioned, namely: Rectification of defects subsequently appearing, property in materials and plant, assignment and sub-letting of contract, bankruptcy of contractor, and, lastly, there will be provisions for the prevention and settlement of disputes.

A Convenient Form of Contract

is, first, to define or indicate the work to be done, the time for its completion and the nature and conditions of the consideration or remuneration, and then to schedule or otherwise annex the general conditions of the contract. These general conditions are, as above indicated, frequently very numerous and exhaustive, and it is not within the scope of this paper to consider them in detail, but it is proposed to select a few of the more important which have been the subject of judicial decision, and to consider them with reference to those decisions.

Before proceeding to consider the first group of clauses, namely, those relating to the work to be done, the time for its completion, the payment or remuneration therefor, we may here consider the position of the architect—(*a*) as regards the employer; (*b*) as regards the builder.

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[*] A paper published in "The Architects' Magazine" (the official publication of the Society of Architects).

The Employer.

(*a*) As regards the employer. The bargain between the architect and the employer for the preparation of the plans, &c., and his remuneration therefor, is of course a separate contract not concerning the builder, and as to this bargain three points only need be here considered—(1) the remuneration; (2) the ownership of the plans; (3) personal nature of the contract.

As to (1), it has been held in a case of *Whipham* v. *Everitt* ("Times," March 22nd, 1900) that though not legally binding on a building owner the charges of architects sanctioned by the R.I.B.A. are evidence of the reasonable nature of the architect's charges if in accordance with the schedule.

As to (2), if there is no special agreement as to ownership the employer is entitled to the plans when he has paid the architect his reasonable remuneration (see *Ebby* v. *McGowan*, "Times," Nov. 17th, 1870).

As to (3), the contract being personal—*i.e.*, the personal skill of the particular architect being deemed to be relied on—the contract is dissolved by the architect's death. This is not so in the case of the builder, although it may be made so by express contract. Apart from stipulation to the contrary, if the builder dies, his representatives are bound to carry out his contract. Further, and this concerns the position of the architect as regards the builder also, he is the general agent of the employer for the purposes of the work he has to superintend (see *Kimberley* v. *Dick*, L. R. 13 Eq. 1), and as a result of this position of agency all dealings between the architect and the builder must be free from any suspicion of collusion; and if any collusion or secret dealing between the architect and the builder can be established, it will amount to a fraud on the employer and entitle him to damages or recission of the contract (see *Panama and South Pacific Telegraph Co.* v. *India Rubber Telegraph Works Co.*, L. R. 10 Ch. 515).

Following the clause or clauses defining the work to be done as the main object of the contract, there usually follow a number of

Ancillary or Subsidiary Clauses

indicating various preliminary and other matters and things to be attended to or done by the contractor, *e.g.*, giving of requisite notice, fencing, compliance with statutes, paying compensation for damage, indemnifying employer against risk.

The number and extent of these obligations, of course, largely depend on the nature and importance of the main works to be done, and the object is to throw upon the contractor the expense of all preliminary and subsidiary matters which may be necessary to be done or settled in order that the main work may proceed to completion without any further expense to the employer than the stipulated cost. It is sometimes stipulated in the contract that all materials be provided by the contractor at his own cost, but, apart from such stipulation, a person who contracts to build a house impliedly undertakes to provide all necessary materials.

The Architect's Powers.

Resuming the question of the contents of the contract, we proceed to deal with the first group of clauses. The architect or surveyor is, as we have seen, the agent of the employer to see to the work on his behalf. In this capacity he is empowered (*a*) to inspect it, and, if necessary, to uncover and look into work for inspection: (*b*) to require any inferior materials to be taken out and replaced by good, and any inferior or unskilful work to be redone or rectified.

If the architect's supervision is thorough, and his powers to cause bad work to be made good are unflinchingly exercised, the probability is that a proper compliance with the contract on the part of the builder will thus be secured. But however careful the architect may be, defects of material or work may possibly be overlooked, and to meet this the clause known as the "defects and maintenance" clause is inserted, providing for the rectification by the contractor of defects subsequently appearing in the work. The contractor, however, cannot reasonably be expected to rectify defects appearing at any time—however long—after completion, and consequently his liability under the defects and maintenance clause is always limited in time.

The clause is, in fact, in the nature of a guarantee that the work is done so as not to give way through defect in material or workmanship, and may be compared to a guarantee given with, say, a watch or a bicycle, and, like such a guarantee, is limited to a period in which such defects (if existing) might reasonably be expected to become apparent.

Such is the nature of the usual provisions for the prevention and rectification of defects. But even apart from such provisions in the contract, if the work is inefficiently done, the owner may deduct from the contract price a reasonable sum in respect of defective work, and if payment has been made, he may obtain damages for such defective work (see *Davis and Hedges*, L. R. 6 Q.B. 187). And if the work is so improperly done as to be useless, he may decline to pay altogether.

Time for Commencement and Completion.

The contract usually provides that upon execution or at some fixed date the builder shall be entitled to enter on the land for the purpose only of executing the works, and so as not to create any tenancy or confer any further interest.

If the buildings are contracted to be finished within a certain time and are not so completed, the owner of course will have an action for damages for such breach of the contract. It is, however, usually deemed inexpedient to rely upon this remedy only, and consequently it is usually provided that in the event of non-completion by the stipulated day a penalty is fixed by the contract of so much for every day beyond until actual completion. These, unless they are excessive or unless there is something in the contract to show them to be included as penalties in the legal sense, are construed as liquidated damages [see *Low* v. *Local Board of Redditch*, L. R. (1892) 1 Q.B. 127].

For the protection of the builder, provisions are also usually inserted to meet the case of delay through unforeseen or unavoidable circumstances, *e.g.*, stress of weather, strikes, disputes with neighbours, &c. In these cases a reasonable extension of time is provided to be allowed by the architect or surveyor. Another cause for extension of time which is usually provided for, though no doubt it would be allowed without express provision, is in the case of extra work being found to be and in fact required.

Consideration or Remuneration.

The simplest case is that where a lump sum is to be paid upon completion. Usually, however, at any rate in large contracts, the builder requires money as the work proceeds, and he therefore stipulates to be paid certain sums at certain stages. In both cases it is usually provided that the certificate of the architect shall be required as a condition precedent for payment, and this provision has given rise to various questions as to the conclusiveness of and necessity for the certificate. It has been decided that it is final and conclusive as between the builder and building owner, even if given without reasonable care (*Stevenson* v. *Watson*, L. R. 4 C. P. D., 148, and *Rogers* v. *James*, 1891, 8 "Times" Law Reports, 67).

This evidently puts great power into the hands of the architect, and much reliance must be placed upon professional honour. The builder has no remedy against him in case of mere negligence or merely unreasonable conduct. In this, however, as in all other matters, actual fraud will give a right to relief; consequently, if the certificate is withheld fraudently and in collusion with the employer, the builder will have a right of action both against the architect for the fraud and against the employer for work done, even though the certificate be withheld.

It is, however, to be remembered that where the contract provides for payments in advance upon the certificate of the architect that so much work, or work of such and such value, has been done, these interim certificates are not final, and when the time for final payment and settlement comes they may be revised and readjusted *Tharsis Sulphur Co.* v. *McElrov*, 3 App. Cases 1040).

Form of Certificate.

The contract may provide that this must be in writing or in some particular form, but in the absence of such provision, it need not be in writing, and may be by word of mouth, and in any form amounting to a certificate, but it must be so expressed as to be in fact a certificate, and not as it were a mere admission.

In the recent cases *Chambers* v. *Goldthorpe* and *Restell* v. *Nye*, 84 L. T. p. 444, it was held that the architect in giving his certificate was in the position of an arbitrator, and so not liable for negligence in so doing. Lord Justice Romer, however, dissented from this view, and considered that on giving his certificate the architect was acting simply as the agent of the building owner, and was consequently liable to him for negligence.

Deviations and Extra Work.

It probably but seldom happens that in carrying out works of any extent they are carried out exactly in accordance with, and without any deviations from, the original plans. As the works proceed, either unforeseen difficulties present themselves, or the works themselves suggest improvements in the original design, or the employer alters his mind as to some idea or detail; acting on the principle that it is the unforeseen which happens, the draftsman takes care to provide for such contingencies as are above mentioned.

The two things to be provided for are (*a*) the extra remuneration for the extra work; (*b*) the further time to be allowed.

(*a*) May be fixed either by reference to schedule of prices, or by the surveyor; and as to (*b*) the contract may stipulate that no further time be allowed, or it may provide that the architect or surveyor may allow such further time as he may think reasonable. If no such provision is contained in the contract, and extra work is ordered, no penalty can be recovered for delay (see *Dodd* v. *Churton*, 1897, 1 Q.B. 562).

It may here be observed that where the contract provides that the architect may order extra work to be done, this does not give him authority to require deviations or alterations amounting to an alteration of the general plan as originally proposed, but only alterations in matter of detail (see *Rex* v. *Peto*, *Younge and Jervis*, 37).

The question frequently arises,

What is Extra Work?

and to this the answer is that it is work outside the contract as originally entered into. If it is necessary for the execution of that work, although not specified it is not extra, and must be done for the price originally stipulated for (see *Sharpe* v. *San Paulo Railway Co.*, L. R. 8, Ch. 597).

Assignment and Sub-letting of Contract.

In order to secure the services of a particular builder in whom the employer has confidence, it is usual to provide against sub-letting or assignment, and also to give power to the employer to determine the contract on the bankruptcy of the builder. In this case, in order to terminate the contract, the employer must do some act indicating his clear intention to exercise the power.

Property in Plant and Materials.

In order to give better security for payments in advance, it is usual to provide that all materials and plant brought on the land shall be the property of the landowner. It would be insufficient merely to give power of seizure upon bankruptcy, for that would not prevail against the claim of the trustee—for this purpose it is necessary to vest the ownership in the employer. Moreover, apart from the question of security, it would obviously be inconvenient to risk the intrusion of the trustee upon the works, and the delay which might be caused by uncertainty as to what he could claim. Of course when materials are built in upon the land they form part of it and belong to the landowner *ipso facto*. It is only in the case of loose materials and plant that the provisions against claims by the trustee in bankruptcy are necessary.

Arbitration and Prevention of Disputes.

The contract usually concludes with a clause or clauses, the objects of which are (*a*) to prevent disputes; (*b*) to settle disputes.

For the prevention of disputes, the architect or surveyor is sometimes empowered to decide finally, and without being arbitrator. This prevents his decision in the absence of fraud being called in question. But it has been held that where the architect has given to the employer an assurance that the cost shall not exceed a certain sum, he is not considered to be in such a position of impartiality as to render his decision unassailable, and if such facts be proved the builder might claim a greater amount (see *Kemp* v. *Rose*, 1 Giff, 258 and *Kimberley* v. *Dick*, L. R. 13, Eq. 1). For the

Settlement of Disputes

which may arise, notwithstanding provision for their prevention, an arbitration clause in the usual form is generally inserted. It is in the interest of all parties—employer, builder, and architect—that the work should proceed smoothly. Every possible question therefore that is likely to arise should be provided for; hence it is of the utmost importance that building contracts should be very carefully drawn, and architects, employers, and builders should endeavour to acqaint their legal advisers with any practical difficulty that may arise in a particular case, with a view to its being obviated in the future, whilst the lawyer's part is to carefully watch the course of judicial decisions bearing on the matter and to frame his contracts from time to time in such a way that the dispute which gave rise to the case in question shall not arise in respect of the contract drawn by him.

Perfection in legal draftsmanship is, perhaps, not possible of attainment, but, if the course I have suggested be taken, we may hope in time and by experience to produce a form of building contract as nearly perfect as it is possible for such a contract to be.

Adderbury Church . Oxon

THE FIRST BUILDERS.

SOME PARTICULARS OF THEIR MONUMENTS.

FROM the East of Asia to the West of Europe, even along the Northern margin of Africa, monuments still remain which, though rude in execution, could not have been reared without long and arduous labour. One group of these consists of the rude stone structures in England sometimes called cromlechs, but on the Continent dolmens, and in certain cases giants' graves. To a great extent their occurrence depends upon the presence of suitable material. Thus monuments of great stones are rare in eastern and southern England, and would probably be altogether absent were it not that here and there huge flattish blocks of hard sandstone, called sarsens, are scattered about. The best known example in Kent is Kits Coity, or Cotty House, hardly three miles from Aylesford. Two huge "sarsen" slabs, about 8ft. square and more than 18in. thick, lean slightly towards a third, more irregular in shape—the three supporting a capstone still larger than those at the sides. This monument stands alone on a bare shoulder projecting from the scarp of the North Downs, whence it overlooks the undulating fertile valley of the Medway. Below it, a third of a mile away, are the runs of another and larger one, as we can infer from Stukeley's drawing. Probably, however, Kits Coity House is only part of a larger structure, and was once hidden by a cairn, though not a trace either of that or of other stones can now be found.

These cromlechs or dolmens are far from rare in Cornwall and in many parts of Wales; they occur occasionally in the Lake country and Scotland, and more frequently in Ireland. In some parts of Brittany they abound, and are scattered in France over a broad belt as far as the Gulf of Lyons; they fringe the Pyrenees and the Cantabrian Mountains; they extend far down Portugal; they are sprinkled over Grenada, and can be followed across the Mediterranean completely through Algeria, even to the eastern side of the Gulf of Sidra. They are also numerous in Northern Germany, Denmark and Southern Sweden. Elsewhere they are at least uncommon, even in places where suitable materials might be obtained. But we find them in Syria, and the builders have left their mark yet farther east in various parts of Asia; while the tribes of the Khasia Hills, south of the Brahmapootra, still erect traditional copies, as we may call them, of ancient monuments.

The structures are built on several patterns. The most simple is a chamber, more or less open on one side. Three broad upright stones, for instance, are placed on as many sides of a square; a fourth, generally rather larger, covering them like a lid. The next stage in dolmen building is to construct a short passage of uprights with smaller capstones as an approach to the entrance. Recesses are sometimes added to the chamber like alcoves or side chapels, or even a second one is constructed. In all these types the plan is rectangular, and the stones used are of considerable size. Sometimes, however, though rarely, the inner chamber is polygonal or circular; in others the passage widens out like the neck of a champagne bottle; in another the tomb becomes all passage, or the ground plan, instead of being a square, as in the first case, is a very elongated oblong, though it is still constructed with uprights and capstones. To this form some antiquaries restrict the term giants' graves.

All these monuments are generally believed to have been buried beneath a cairn of stones, which, however, has often entirely disappeared. But in another and rarer class of monuments the whole was buried deep beneath a great mound, so that it became a kind of pyramid, but of loose stone instead of masonry. These, no doubt, mark the resting places of exceptional personages, and not improbably they are rather later in date than most of the others, for the stones are sometimes rudely sculptured. The most remarkable example of this kind is to be found in Southern Brittany, on the shore of the inlet called the Morbiham, near the village of Lokmariaker, which seems, from the number and size of its monuments, to have been a kind of Iona in prehistoric times.

In a few—probably later—instances a kind of rude masonry has been introduced. Under a large mound the Mont St. Michel, between Lokmariaker and Carnac, is a square chamber approached by a long gallery. Here, however, the walls are formed of a kind of masonry—that is, of large blocks laid in rude courses. New Grange, a few miles from Drogheda, is an example of another type. Here the roof of the inner chamber is formed of slabs, each overlapping the one below, till at last they are capped and held in place by a single stone. Such first attempts at vaulting are found elsewhere; for instance, in the tombs of the kings at Mycenæ. Some of the stones at New Grange are also engraved with the usual patterns.

These monuments cover a long period, extending from early in the Neolithic, or later Stone Age, into that of Bronze. But this does not help us much to exact dates, which, indeed, would not correspond in all countries. Some archæologists have thought that in Scandinavia, where civilisation was no doubt late in arriving, the later Stone Age may have lasted from 2000 B.C. to 1000 B.C, and the Bronze Age down to about 500 B.C. But the tendency of recent investigation has been to carry such dates backward rather than forward. The Dolmen builders can hardly have passed across the valley of the Nile when it was held by a powerful race; yet the Pyramids are not much less than six thousand years old. So we can say little more of these rude stone monuments than that they probably differ much in date, and that some of them were very old when the ploughshare traced the walls of Rome.

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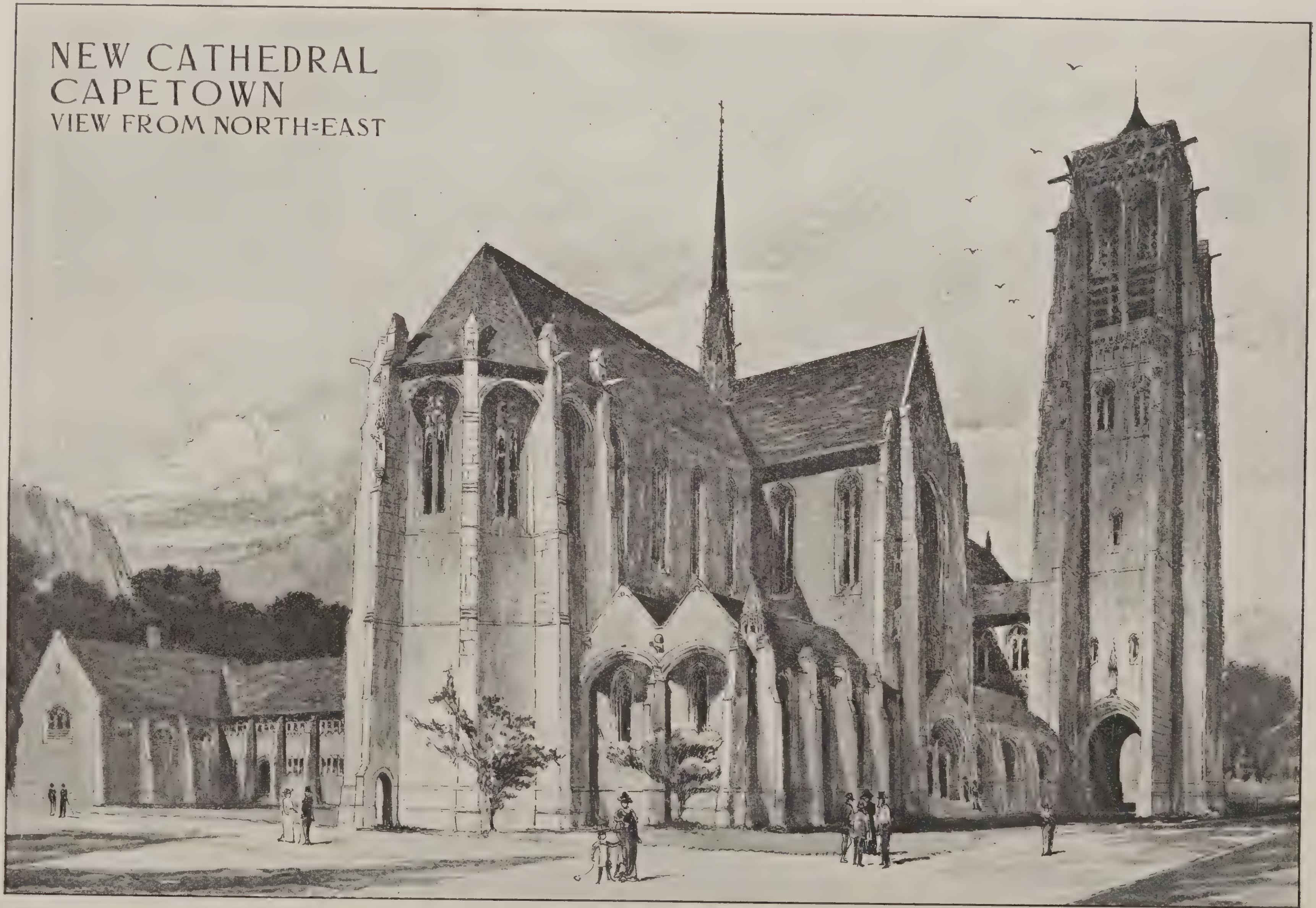
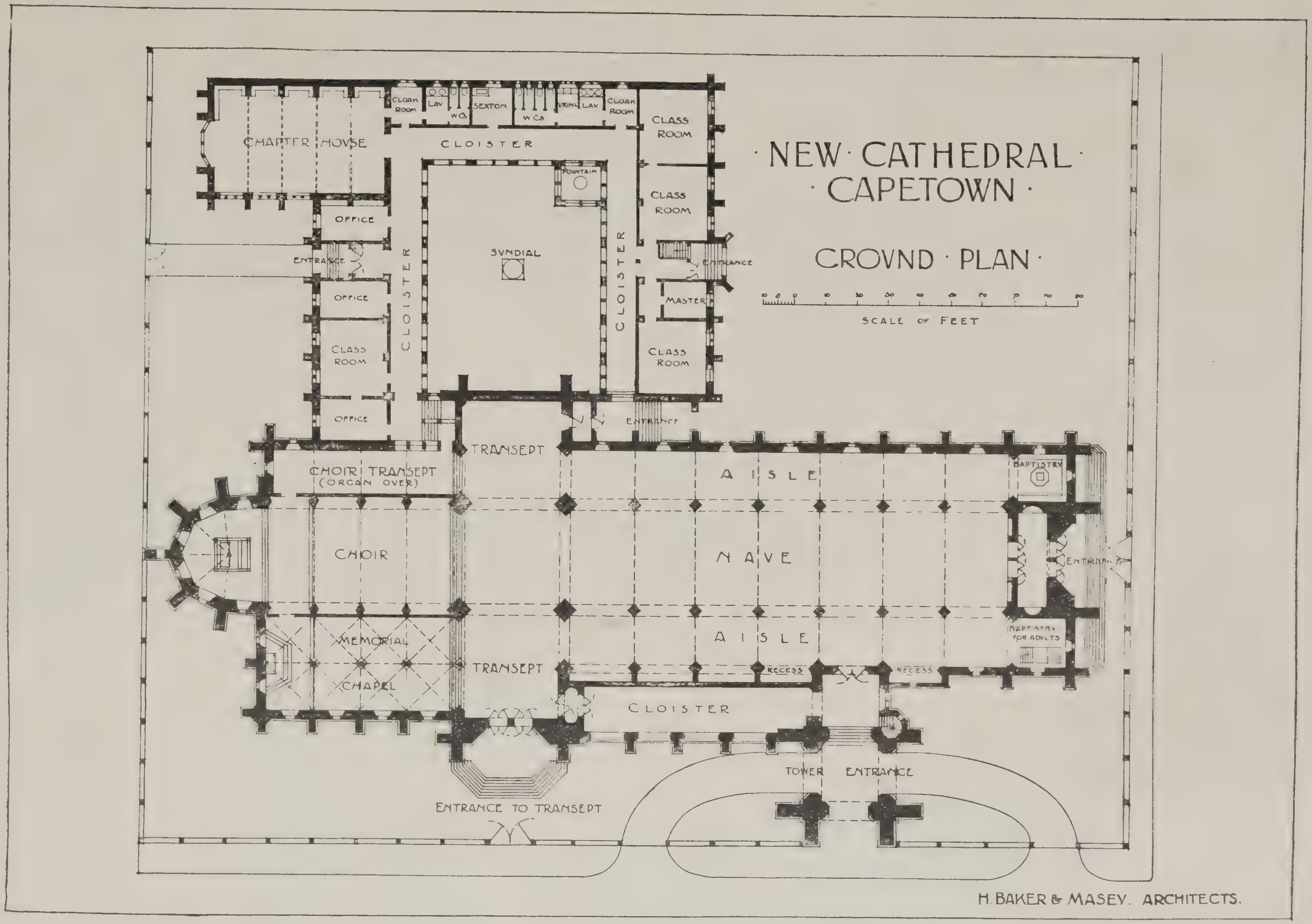
Supplement to
The Builders' Journal and Architectural Record,
Wednesday, July 17th, 1901.



Herbert Baker, F.R.I.B.A., and Masey, Architects.

Supplement to
The Builders' Journal and Architectural Record,
Wednesday, July 17th, **1901.**



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ricks and Mortar.

HORISM FOR THE WEEK.

f the king is in the palace, nobody looks the walls. It is when he is gone, and the se is filled with grooms and gazers, that we n from the people to find relief in the majestic that are suggested by the pictures and the hitecture.—EMERSON.

Our Plates. PARTICULARS of the proposed new cathedral at Cape Town re given on p. 442 of our issue for last week. e portion to be erected as a memorial to those o have fallen in the South African War will the choir transept, choir and memorial chapel wn on plan.—The measured drawings illuste the article on Glasgow Cathedral on p. 454 his issue.

Preservation. f the National Gallery. THE Select Committee of the House of Commons appointed to consider the Government measure entitled National Gal- y (Purchase of Adjacent Land) Bill sat last ek, Mr. Akers-Douglas presiding. The Bill ls with the acquisition of a small piece of d on the west side of the National Gallery. e National Gallery is not itself entirely lated. It stands in a block, of which the jor portion is taken up by St. George's rracks. On the west side there are a series shops and some stables belonging to Lord nsdale, and the object of the Bill is to make a ce on the west side of about 38ft. broad, exding to the back of Lord Lonsdale's stables l taking land on which some shops are at sent situated and a portion of a court called nmouth Court and a couple of cottages. This n space will be of great service in case of fire. e Bill is in the form adopted in the Public rks Sites Act of 1897, and deals with the de of taking the land, incorporating a portion the Lands Clauses Acts which are suitable to h acquisition, and also dealing with the lition of the land tax and the extinction of hts of way. The measure also contain saving uses for the County Council and for the protion of the works of gas, water and electricity npanies, and to provide that the expenses ll be paid by Parliament by annual votes. The mmittee passed the Bill for third reading.

Housing Question. THE annual conference of the Urban District Councils Association was held recently in ndon, over 400 urban district councils being resented. The chairman, Alderman P. Wilson ffan, Monmouthshire, read a paper on "The using of the Working Classes." He conded that urban district councils were bound deal with the question unless they were tent with a lax administration of the law inst overcrowding and insanitation. Experience had abundantly proved that it was useless urn people out of their present houses, howr unsuitable these might be, unless there was newhere else for them to go. He alleged that m one-fourth to one-third of the working sses of the country were improperly housed. half a million workmen's cottages were cted by the local authorities, there would l be no overplus. There was really a house nine in the country, but he believed that it s a house famine artificially created by the ners of land, who kept desirable sites out of market in the hope that their value for lding purposes would be increased by the ssure of population. The taxation of land ues was the real remedy for this state of ngs, and he believed that if this were secured problem would largely solve itself.

Hartland Church. THE fine old church of Hartland narrowly escaped destruction by fire recently. It is of the most interesting of the many ancient red edifices in Devon. The church was forrly attached to Hartland Abbey, said to have n founded by the consort of Earl Godwin, escaped death from drowning just at that t of the wild Devon coast. The church is licated to St Nectan, and from an architecal standpoint possesses great merit. It has ost curious font, numerous memorials, an old een in perfect condition, an ancient stone r, and a pulpit of the time of James carved in black oak. This pulpit has the figure of a curious animal said to be a tusked goat, and on it the legend, "God save King James, Finis." It has been suggested that Finis was the name of the carver and the goat his escutcheon. In the pavement there is an old stone dated 1055. Supposing that the figures be genuine they carry us back to eleven years before the Norman Conquest. To the right of the east window is a monument erected in 1610. There are many other relics of past times.

The Abbey Church, Malmesbury. THE Bishop of Bristol appeals for help towards making safe the Abbey Church of Malmesbury, used as the parish church since the Reformation, and preserving from further decay the very interesting portions of the central tower and the west front which remain in a ruined state. No place can claim more unbroken ecclesiastical and educational continuity between the Irish, British and English churches as Malmesbury. Aldhelm's Saxon basilica of stone was standing at the time of the Norman Conquest, and, like his other great church at Sherborne, it was spared by the Norman architects. Dunstan had given to it an organ, probably made by himself. It was not till after William of Malmesbury's time that the monks built the present Norman nave, about 1140–60. Six of the bays of their nave remain, and form the present parish church. The three western bays and the west front are in a ruined state; but so much of them remains that no great cost is needed to make them quite safe, while retaining, and indeed in some respects enhancing, their picturesque appearance. The noble northern arch of the central tower needs careful attention. The Bishop of Bristol says that when he was first appointed the condition of the parish church caused him very great anxiety. The flying buttresses and parapets were actively dangerous, and there were grave fears lest a double buttress at the south-west point should give way, in which case the singularly noble south porth would have been destroyed. By great exertions the people in and near Malmesbury have raised between £3,000 and £4,000, and this has enabled almost the whole of the six bays used as the church to be made safe. The more ruined parts of the old building now need attention, and the sum of £10,000 requires to be raised.

The Ecole des Beaux-Arts. A CURIOUS instance of redtapeism has occurred at the Ecole des Beaux Arts, Paris, in connection with the work sent home by the winners of the Prix de Rome. As is well known, those who obtain this prize have to submit specimens of their work once a year to the authorities of the school, where these are publicly exhibited. This year M. Tony Garnier, an architect, sent a drawing representing a "Cité Industrielle," and it was rejected because it was not in accordance with the regulations, which provide that architects must send only plans of restoration or copies of monuments representative of the best periods of Latin art. Of course, this means that the student has no initiative while studying in Rome, which is surely an absurd system. M. Garnier is evidently a young man of courage, for he wrote on his design: "All forms of architecture are based on false principles; ancient architecture is an error. Truth alone is beautiful." This radical declaration must have shocked the school directorate.

Control of Public Advertising. THE National Society for Checking the Abuses of Public Advertising have addressed a memorial to the President of the Local Government Board. The memorial says:—"We desire respectfully to represent the expediency of legislation by which municipal authorities would be empowered to frame and enforce regulations for the control of advertising display in public places. In 1899 the corporation of Edinburgh obtained a private Act powers for this purpose. Since then many other municipal bodies which were promoting Bills have inserted provisions, following more or less closely the lines of the Edinburgh scheme. The case of Dover is peculiarly interesting as an illustration of the absolute need of restrictive power. An American firm have erected, in positions which make them visible against the face of the cliffs, two huge boards, which, in the judgment of most observers, destroy the beauty of a scene of which every Englishman is proud. The firm in question, though requested by the town council and by a 'deputation representing the London bill-posting interest,' refused to remove the erections. There is a general feeling that the absence of any restraint upon the power of individuals to assail the eye of persons using public thoroughfares causes a grievous loss of comfort and of pleasure to the community. We respectfully urge that municipal bodies should have general authority to frame suitable by-laws, and that they ought not to be put to the expense of promoting special private legislation for the purpose. We would, therefore, ask that the Government should either give facilities for the consideration of the Bill prepared by the Society for Checking the Abuses of Public Advertising, or should themselves introduce a measure dealing with the subject." Among the signatories to the memorial (150 in all) are: The Lord Mayor of London, Mr. A. M. Torrance (chairman London County Council), Lord Monkswell, Mr. Lionel Cust, Mr. Sidney Colvin, Sir Reginald Palgrave, Lord Avebury, Lord Kelvin, Sir W. H. Preece, Sir Edward J. Poynter (President of the Royal Academy), Mr. G. F. Watts, R.A., Mr. Alfred Waterhouse, R.A. and Mr. T. G. Jackson, R.A. The reply of the Local Government Board was that no promise could be given that the Government would initiate legislation on the subject. The subject, however, appeared to be worthy of attention, and if in a future Session a Bill was introduced into Parliament by a private member on behalf of the society the Government would carefully consider its provisions and would watch its progress with interest.

In Explanation. MR. RICHARDSON EVANS, the Secretary of the Society for Checking the Abuses of Public Advertising, states, with reference to this correspondence: "Since the memorial was prepared the proprietors of the commodity advertised at Dover have courteously sought an opportunity of assuring us that, in deference to public feeling, they offered to remove the boards on condition that the town council compensated them for the bare cost of erection: and that they would before this have withdrawn them if they had any assurance that the site would not be used for others of a similar character. We have reason to hope that the clauses giving the Dover Town Council the necessary powers in such cases will not be opposed in the Private Bill Committee of the House of Commons. They have already been approved by the Peers. In the separate recommendations by Lord Balfour of Burleigh attached to the final report of the Royal Commission on Local Taxation the Secretary for Scotland urges that 'large powers of taxation as well as other powers for the control of advertisements should be conferred on municipalities as a right properly belonging to the guardians of the beauty and dignity of thoroughfares and public places.' We regard this expression of opinion from so high an authority as most encouraging. Some of the business organisations which will be affected by the legislation we advocate have imputed to us intentions which we desire to disclaim. Let me repeat that we aim at no censorship on grounds of taste, at no prohibition of any particular type of bill or sheet. The only interference we contemplate on the part of municipalities or county councils with the display of posters or ordinary wall announcements would be a refusal to allow the use of hoardings or other erections on such a scale or in such positions as would be an unjustifiable impairment of the local amenities. We should expect that the municipal bodies, while still content to act only in deference to the well ascertained views of the residents in the places affected, would take cognisance of many abuses which do not come under the head of 'advertising' in the stricter sense of the term. Sky signs, field boards, huge letters on house fronts, roofs, and chimneys would claim attention so far as they be of a nature which average local opinion, as constitutionally expressed in the council, condemns. The factors in determining the use made of statutory powers would in brief be the character of the immediate locality as regards natural beauty, architectural interest, the sensibilities and the pursuits of those who would be subject to the display."

Builders' Notes.

Mr. J. W. Haigh, managing director of the Ruabon Brick and Terra Cotta Works, died recently at Harrogate, at the age of about fifty years. He was a native of Todmorden.

The New Union Infirmary, Kingston-on-Thames, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues and patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

Brighton Building By-laws.—The Improvements and Buildings Committee of the Brighton Town Council recently submitted draft amendments of and additions to the building by-laws, and recommended that they should be approved and forwarded to the Local Government Board for their preliminary approval. The by-laws are those recommended by the Local Government Board and almost exactly similar to those which had been carried out in Hove. On the motion of Councillor Holloway an amendment that the consideration of the by-laws should be deferred for a month was carried in order that the committee might invite the views of one or two builders on the council.

A Working Class Inquiry.—At last week's meeting of the London County Council the Housing of the Working Classes Committee recommended an expenditure of £500 in prosecuting inquiries with regard to the distribution of working-class population in London. Several members spoke of the inadequacy of the sum to be provided if the inquiry was really to be of any value, whilst others thought that any such examination had better be left to the borough councils. Mr. Waterlow (chairman of the committee) said that, in view of what had taken place at the recent conference between the Council and the borough councils on the subject of housing, he was willing to take the report back. The report was then referred back.

Partnerships Dissolved.—The partnership subsisting between Messrs. John Scott Flower, Walter Flower and David Flower Parker, carrying on business as builders and contractors, at Wakefield, in the county of York, under the style or firm of Flower Brothers, has been dissolved by mutual consent as and from the 1st day of January, 1901. All debts due to and owing by the said late firm will be received and paid by Messrs. Walter Flower and David Flower Parker.—The partnership subsisting between Messrs. John Scott Flower and Walter Flower, carrying on business as brick and tile manufacturers, at the city of Wakefield, under the style or firm of The Windhill Brick Co., has been dissolved by mutual consent as and from the 1st day of January, 1901. All debts due to and owing by the said late firm will be received and paid by Mr. Walter Flower.

Peterborough Building By-laws.—Mr. Pine, in proposing the adoption of model building by-laws which came before the Peterborough District Council recently, said under the present regulations the surveyor had only power to interfere where sanitary concerns were involved; he had no authority to stop anyone running up a jerry-building and placing on it a roof of wood. The by-laws in operation in Peterborough were very good, and the effect was an altogether improved class of building. Before they were instituted, however, some rascally things were tolerated. Mr. S. Vergette advocated adherence to the existing rules. The council took considerable pains in framing them, and he thought they were sufficient. In rural districts very little building was undertaken, and as far as experience went the work was very fairly done. This meddling on the part of officials was often more a nuisance than anything else. Mr. Dean supported Mr. Vergette, remarking that if the council insisted upon the observance of model regulations there would not be another workman's cottage built in the district for the next ten years, except perhaps by some big landowner. An agricultural labourer could hardly be expected to pay more than £5 or £6 a year in rent, and no man could afford to build a model cottage for such a small return. There was no comparison between an urban and rural area. The chairman said he remembered perfectly well that the model set were more stringent, and he thought many of them could be omitted. On the other hand he thought it was possible that if they went into the matter again they might find some very good laws that might be incorporated in those already adopted. The matter will be revived at the next meeting with a view to its delegation to a committee.

St. Paul's Foundations.—St. Paul's Cathedral is built on a somewhat unsatisfactory foundation. Dean Milman devoted a good deal of attention to the matter and left the result of his researches on record. Old St. Paul's rested on a layer of loam, and when Sir Christopher Wren had this examined he found that it gradually diminished towards the south from a depth of 6ft. to 4ft. Beneath this he found loose sand, then a layer of fresh-water shells and more sand, before reaching the London clay. At one point of the north-east corner the present foundations rest on the clay, but the remainder is built on a less secure soil. Quite early in the history of the present structure the great weight of the dome caused some of the piers to sink from 1in. to more than 2in. The cracks and fissures were repaired by Edward Strong, whose work is described by the antiquary Clutterbuck. The cathedral authorities are aware of the importance of avoiding any interference with the subsoil; and when the City authorities proposed to carry a sewer along the road to the south of the cathedral strong representations were made by Dean Milman and the cathedral surveyor, and the project was abandoned.

Builders in Conference.—The members of the National Federation of Builders, of which Mr. A. Krauss, of Bristol, is president, met at Glasgow last week, and the Institute of Builders also met in the city at the same time. Both bodies were present at a reception given by the Lord Provost and ex-Bailie Shearer, and the courtesies of the reception were acknowledged by Mr. King, of London, on behalf of the Institute, and by Mr. Krauss for the Federation. The latter, in the course of his remarks, referred to the erection of buildings in Glasgow without outside scaffoldings, which process, he said, they had been unable to carry out in the South of England. The half-yearly meeting of the Federation was held afterwards, and several matters affecting the interests of the building trade were discussed, among them being the restrictions imposed by operative trade unions in regard to the fixing of ready-made joinery and worked stone which had been prepared in places other than those in which they were to be fixed. Members gave instances of operatives refusing to fix material which had been prepared in other districts, notwithstanding that the rates of wages in those districts were higher than in the district in which the material was intended to be used. A resolution was passed expressing the opinion that the restrictions were not only harsh in regard to their application to employers, but hurtful to the general welfare of the trade.

New Patents.

These patents are open to opposition until August 19th.

1900.—Urinals.—14,097. J. Shanks, Tubal Works, Barrhead, Renfrew. The vertical partition slabs of urinals do not extend to the back slab or wall as ordinarily. It is claimed that the space thus left behind the whole length of the bays keeps the urinal cleaner and lessens the number of joints in which deposits can lodge.

Glass Tiles.—14,219. F. Beer, 125, Boulevard Exelmans, Paris. The key for attaching the glass tile to the wall with cement or plaster is made by coating the glass with a mineral cement formed of a soluble silicate mixed with powdered carbonate of lime.

1901.—Construction of Quay Walls, Dams, &c.—7,240. F. Hennebique, 2, Rue Danton, Paris. In order to get over the difficulty of constructing the foundations of walls of quays, &c., on alluvial ground, caissons or troughs of strengthened beton cement are moulded of variable length open at their upper part which is to form the top of the wall to be erected and capable of being floated to the place where they are to be used. These caissons are then filled with masonry and form a section of the wall, which in its entirety is constructed of a series of such troughs connected by a joint of cement run between the adjacent lateral walls.

Engineer's Squares.—9,989. W. Chesterman, Bow Works, Sheffield. The square has its blade held on the stock by screws and pressed against a shoulder of the stock at right angles to its sides by eccentric washers under screwheads.

The following specifications were published on Saturday last, and are open to opposition until August 26th. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1900.—11,030, McDougall, machinery for securing wood plugs in vitrified bricks. 11,606, Klopp & Klopp's Patents, Ltd., cocks or taps. 11,779, Criswick, fastenings for doors. 13,109, Asbell, valves for water-closets. 13,793, Ransome, mould for building concrete walls and structnres. 13,896, Soc. H. Croizier & Cie, manufacture of artificial stone blocks, &c. 13,911, Polson & Polson, pumps. 14,697, Thomson, woodblock flooring, mosaic, tile and other paving. 14,778, Croizier & Thomine, manufacture of artificial stone. 15,136, Wust, hoists. 15,388, Koenen, concrete floors. 16,985, Lane & Leeds Forge, Co., Ltd., manufacture of doors. 23,130, Burns & Mercer, locks.

1901.—357, Urquhart (*Kubin*), acetylene lamps. 816, Byrens, Drew & Pearson, windows. 4,202, Marx, manufacture of artificial stone. 4,318, Shone, picks, hammers, &c. 6,234, Köhler, portable buildings and like structures. 6,884, Hudson, protecting covers for pipes, &c. 7,766, O'Brien, tap or faucet. 8,688, Richter, water-pipe systems. 8,715, Weber, apparatu for heating air. 8,817, Boult (*Soc. Lumière Boule*), high-pressure incandescent gas-lighting plant. 9,069, Foster & Compton, apparatus for heating buildings. 9,111, Thompson (*Kane & Taylor*), metal pipe. 9,376, Czèrmak, manufacture of imitation marble. 10,209, Haddan (*Bullock*), cisterns or tanks for water-closets 10,211, O'Shea, construction of floors and ceilings. 10,297, Von Forell, manufacture o Portland cement. 10,301, Hartmann, mean for preventing water-closets from freezing 10,400, Clarke, water or weather excluder fo doors.

THE CEMENT INDUSTRY OF THE UNITED STATES.

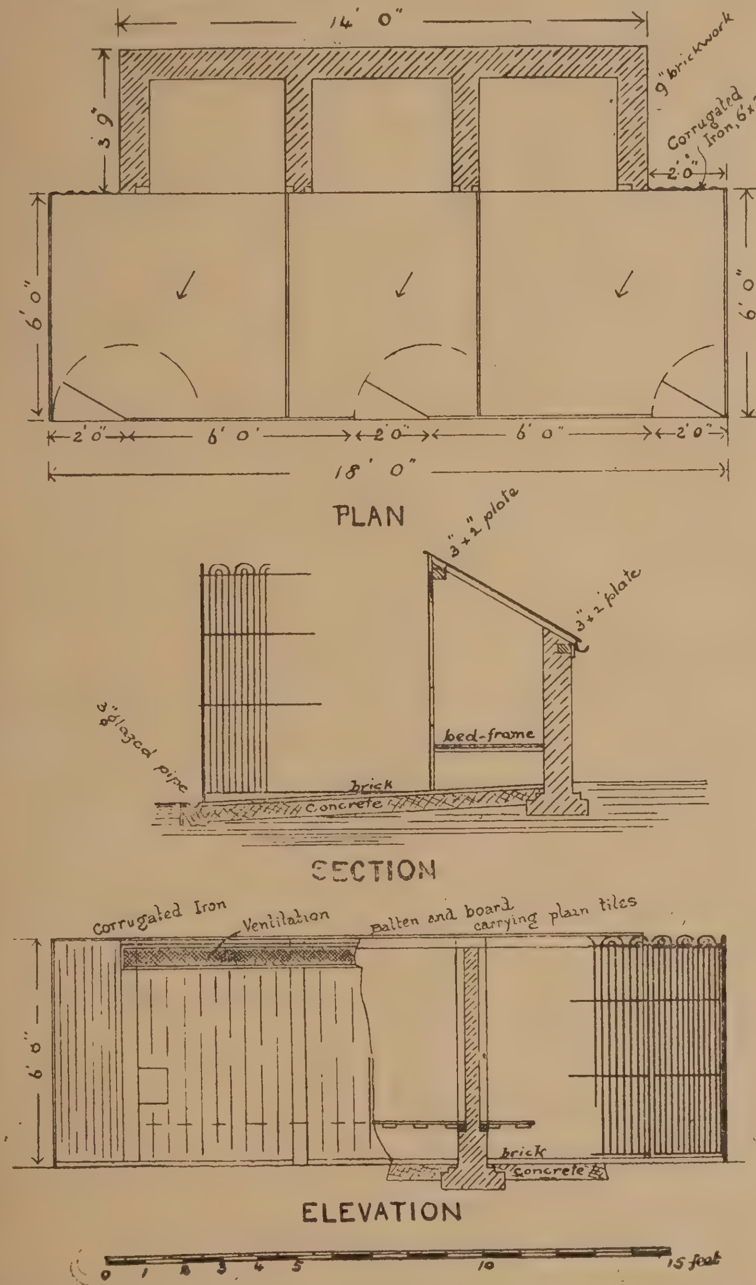
THE British commercial agent in the Unite States in a recent report on the cemen industry there states that this is not receivin from British manufacturers the attention i deserves. The production of Portland and othe cements in America is increasing, yet the importation is still large, and does not exhibit th decrease which might have been anticipated The demand for cement is increasing, and ther has long been a prejudice amongst America engineers and contractors against the hom product; but this feeling is dying out and n doubt in time the country will supply its ow requirements. In 1891 only 13·2 per cent. c the cement used in the United States was c home manufacture, while in 1899 the proportio was 73·9 per cent. British cement has varie from 9 to 15 per cent. of the total imports sinc the beginning of 1899; Germany has the larges sale in foreign cements, its import amounting t about half the whole foreign imports. It seem that German cement is cheaper than the Britis is more energetically advertised and pushed, an some think, better in quality. Upon this las point, however, there is some difference c opinion. Belgian cement, though inferior to th British, is much cheaper, and makes its way o this account. Last year the total of the cemen imported was little short of 1,000 million pound weight, of which New York, San Francisco, an Baltimore took nearly half. In 1899 the tot production of the thirty-six works in the Unite States was over 5½ million barrels, valued a 8,000,000 dols., being an increase of 53 per cen in quantity and 35 per cent. in value over th previous year. The Lehigh Valley in easter Pennsylvania is the chief seat of the industr and produces more than the rest of the country together. Two cement works there are said to be larger than any other in the world. One of them produces 8,000 barrels a day. Mr. Bell expects a sharp fall in the prices of the home product in the United States owing to the keen competition, and he believes that the present rate of increase in the production cannot be continued without disaster. The rotary kiln is now used generally in the industry on account of economy, and every known mechanical device is introduced wherever possible to handle the materials rapidly and efficiently. Besides Portland cement, large quantities of natural rock cement are manufactured, chiefly in the States of Indiana and New York. In 1899 the production of this cement was 9,868,179 barrels, that of Portland cement 5,652,266 barrels, while the importation of Portland cement was 2,108,388 barrels, making a total consumption of all cements in the United States in that year of 17,628,833 barrels.

The Matriculation Directory for June, 1901, has just been published by Messrs. W. B. Clive & Co., of 13, Booksellers' Row, Strand, W.C., price 1s. nett. This issue of this excellent guide to the London University examinations gives the subjects for the next examinations, with suggested text-books to study, the papers set at the June examinations with model answers, and various other information.

DOG KENNELS FOR A SMALL ESTABLISHMENT.

By G. S. MITCHELL, F.S.I.

THE situation of dog kennels should be high and dry, and though open enough to secure a good circulation of air, it should be sufficiently retired to avoid the nuisance caused by the dogs constantly barking at passers-by. Kennels should not face due south unless plenty of shade be afforded, or they will be very hot, and besides may cause some annoyance by effluvia. The writer has found a small range of kennels as shown in the drawings here given to be very convenient in use and economical in construction.



RANGE OF DOG KENNELS FOR A SMALL ESTABLISHMENT. BY G. S. MITCHELL, F.S.I.

Lodgings.—The walls of the "lodgings" are of 9in. brick up to the level of the framing of the "bed"; above this, their thickness is reduced to 4½in., and the set-offs thus made form the rests (2¼in. in the centre and 4½in. at the outsides) which carry the "bed" frames. The size of the "lodgings" should not be greater than about 3ft. square, and the "bed" should be from 12in. to 18in. above ground line. The walls are furnished with damp-courses and footings in the usual way.

The roofs deliver the rainwater to the back, and not into the "runs," and a bit of 4in. half-round spouting must be furnished to prevent the water soaking into the walls. The covering should for preference be tiles or slates laid on ¾in. rough boarding, but if desired galvanised and corrugated iron sheets may be employed. If wall plates 3in. by 2in. or 4in. by 3in. be placed on the back and front walls, the ¾in. boarding may be nailed on to them (*i.e.*, up and down the roof) and battens fixed on top of the board to take the roof-covering. Especially is it desirable to have battens as well as board if corrugated iron be employed, that a more equable temperature may be maintained in the "bed-place."

The runs are about 6ft. by 6ft., and a convenient method of arranging them so that only the standard 6ft. lengths of fencing shall be employed is that shown in the plan. The fencing shown is free of any sharp points, with their possible injury to a dog should it attempt to jump the railing. It is of wrought-iron 6ft. high, having 4ft. horizontal bars each 1in. by 1½in., and ⅝in. round verticals spaced at from 2in. to 2½in. intervals. Its cost is from 7s. to 7s. 6d. per yard run. If preferred a shorter fence may be utilised by fixing it on the top of a dwarf wall, but I prefer all the railings to go down to the ground level because the passage of air through the runs is not then impeded. If it be found afterwards necessary to shut off the dogs in one compartment from their neighbours a corrugated iron sheet or two may be employed—temporarily or otherwise. The gates shown are made to match the railings, and are of 2ft. opening and cost about 30s. each, complete with proper standards and slip bolt. Each of the two outer runs is completed by means of a corrugated iron sheet fixed in an upright position as shown, and secured by angle irons to the brickwork of the lodgings and by bolts to the iron railings. Should it be found that the dogs jump—retrievers especially are apt to do so—it will be necessary to cover in the runs with ordinary galvanised wire netting laced to the top of the fences.

The floors of the "runs" and "lodgings" are laid with a very good fall (6in. is not too much in such a case) as the smell from kennels with insufficient run is very unpleasant. The drainage should therefore be very complete and ample facilities afforded for flushing everything down periodically. The floors are formed of hard paving squares or quarries laid on 6in. of cement concrete—paving bricks on end all round the margins keeping the squares in position. An open drain of 3in. half-round glazed socket pipes is laid along the front of the runs (outside) upon a cement concrete foundation and securely kept in position by a margin of paving bricks on end. In the upper part of the run a hollow is formed in the quarries and concrete of the exact size to receive a water-trough. This is of glazed stoneware, and is furnished with a flat rim to rest on the paving all round the cavity; the trough should be loose in order that it may be removed at any time for cleansing purposes by slipping a knife blade or spade under the rim—the trough I have used costs 2s. 6d., is made by Messrs. Oates & Green, Ltd., of Halifax, and is described in their catalogue as a poultry trough (No. 530).

Bed places.—Upon the ledges formed in the brick walls, as already described, spar-framed beds of about 1½in. by ¾in., with slightly stouter ledgers, are formed to fit in each lodging; they simply lie loosely and are kept in position by the wooden fronts to the bed-places, which are formed of narrow ¾in. boards with light ledgers and are kept in position in their turn by turn buttons on the face of the division walls to the lodgings. Entrance holes are cut to the bed-places at a little higher level than the spar frames in order that straw if used for bedding may not be dragged out by the animals when emerging. Should the dogs bite the edges of the openings a little hoop iron may be tacked on. The whole of the woodwork, fronts, beds, &c., is arranged to come clear away for cleaning or disinfecting purposes. Efficient ventilation is provided by wire gauze along the whole front of the lodgings, and all the exposed iron and woodwork (including roof if corrugated iron be used) should be painted three coats in good dark tints; indian red or purple brown are both good wearing colours.

The Society of Architects has cancelled the arrangements which were being made for the visit to Oxford on July 27th, owing to insufficient names having been received.

Engineering Notes.

Grimsby Dock.—The Select Committee of the House of Lords last week considered the Humber Commercial Railway and Dock Bill. under which power is sought to construct a new dock at Grimsby. The Committee found the preamble of the Bill proved, if the parties could agree to a clause which, when the new dock is built, will not deprive the Great Northern of its fish traffic.

A Branch Railway Line from Kilbowie Road, on the Lanarkshire and Dumbartonshire Railway, is being carried across the Forth and Clyde Canal in the vicinity of the Singer's Factory. A swing bridge has been erected. The line is to connect public works on the north bank of the canal at Dalmuir, but it is possible it may yet be extended further in the direction of Duntocher. A start has also been made with the sewage purification tanks and dock for the Corporation of Glasgow at Low Dalmuir in connection with the western district sewage scheme. The work will take several years to complete. Messrs. Robt. M'Alpine & Sons are the contractors on both schemes.

Dundee Gasworks are being reconstructed. All the brickwork, ironwork and slaterwork in connection with the new retort house and coal stores is now completed. The north chimney was completed on May 30th, and the south chimney is now completed to a height of 50ft. All the stone piers and girders for carrying the high level railways in the coal stores have been completed, and as many sidings laid down on the high level as can be done at present owing to the continued slow progress that is being made with the excavation of the rock and the building of boundary and retaining walls. The erection of pumping engines and boilers has been commenced, although the rock has not been excavated from behind them, but they will be protected as far as possible by wooden erections to prevent any accident occurring to them while the rock is being excavated. The contractors for coal breakers, stoking machinery, &c., are making good progress with the carrying out of their contracts. The erection of the foul mains between the new retort bench and the existing condensers is almost completed. The narrow gauge light railway is well advanced.

Yorkshire Electric Power Bill.—The Select Committee of the House of Lords last week allowed the Yorkshire Electric Power Bill to proceed. Under the Bill power is sought to supply electricity for power in a district 1,820 square miles in extent in the West Riding of Yorkshire. The capital of the scheme is £2,000,000, with borrowing powers of £666,000 more. The chief opposition was offered by the corporations of Leeds, Sheffield and Bradford, who desired absolute power to prohibit the company from supplying in their areas, even to the limited extent proposed—viz., to railways, water companies and canals; and they also objected to the company's proposed power as to wayleaves to carry their cables through these places in order to supply to places beyond. The committee found the preamble proved and gave the power sought to supply railways, canals and water companies in the areas of the corporations, but they fixed certain districts in the centres of the towns named within which the company were not to lay their mains.

Light Railways in Middlesex.—At Wood Green last week the Earl of Jersey and other Light Railway Commissioners concluded an inquiry into an application by the Middlesex County Council for sanction to a scheme for the construction of five lines of light railways in the county. These included lines in Hornsey, Tottenham, Friern Barnet and Wood Green, making a total of 73 miles. For the county council it was contended that tramways were needed because the railways did not and could not satisfy the demand for intercommunication in the county. The county council felt that they should be the tramway authority, as they alone could put forward a comprehensive scheme to cover the whole county. Mr. James Bigwood, M.P., a member of the Middlesex County Council in giving evidence in support of the scheme, said that the idea of the council was that these light railways should radiate from London like the spokes from the hub of a wheel, and the council thought that, wherever a tube railway debouched, there should be in connection a light railway to carry people further out into the country. The scheme was opposed on behalf of the Hornsey District Council, on the ground that the proposed lines in Hornsey were local lines, and, if required, should be constructed by the local authority. The line from Archway Road, Highgate, along Muswell Hill Road to Muswell Hill and the Alexander Palace was strongly opposed, the Hornsey District Council having received a memorial signed by 415 householders at Muswell Hill in opposition to the undertaking. The district council also opposed the proposed line along Tottenham Lane, Hornsey, on the ground that the thoroughfare was a narrow one, and no provision was made for the necessary widenings. At the conclusion of the inquiry, Lord Jersey said that the Commissioners could not recommend the sanctioning of the Muswell Hill line, but they would recommend the sanctioning of the Tottenham Lane line, subject to the roadway being widened to 50ft., or, with the approval of the Board of Trade, to a minimum of 45ft. where 50ft. could not be obtained. They would also recommend that the construction of the other lines be sanctioned.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Sinkage of Floor, and Mahogany.

Leicester.—R. G. writes: (1) "Three years ago I built two houses, living in one myself. They are both on the same level. There is waste ground about 18in. lower than the causeway on the outside of one and outside the other is a garden about 18in. lower than the causeway. They are on a clay subsoil. Last December a heavy rain fell and the houses were flooded, the water getting into the kitchens of both houses from the front part under the floors through the air bricks, but it soon disappeared. A few hours after, on walking into the tile-paved passage, I felt a movement, and on examining it found it had sunk, a 1¾in. fracture of the tiles being caused where marked on the plan (not reproduced). It has, however, not gone further, being quite solid. The tiles were laid in cement on a bed of lime concrete 6in. thick. The passage in the other house only sunk about ⅜in. What do you think was the cause? The builder and I disagree as to it; I think it was not sufficiently rammed when filled up, and he gives the reason that the fine stuff, if any, would be carried away, but I cannot see how that would be when the area of the passage was enclosed within brick walls. (2) Is Cuban the same as Spanish mahogany or are they separate varieties? If the latter, what are their chief qualities and characteristics?"

(1) The settlement is probably due to the shrinkage of the 18in. of filling placed under the tile-paved floor; more especially as a somewhat similar subsidence has occurred under the tiled floor of the adjoining house, whilst the walls themselves are apparently unaffected. This shrinkage may have resulted from insufficient ramming or consolidation of the filling, or might have been caused by the use of unsuitable material for raising the ground level. If clay-filling has been used, then the subsequent immersion and saturation resulting from heavy floods, &c., would readily account for the settlement. In such situations the most satisfactory method is to bring up the surface of the ground to the required levels in concrete; or if the strictest economy is essential, then a hard compact material such as gravel or broken brick rubbish should be provided and thoroughly well rammed in thin layers.

(2) Mahogany from the West Indian island of Cuba is known as "Cuban" or "Spanish" mahogany, and the terms refer to the same description of timber. Mahogany obtained from the adjacent mainland of Central America (in the district around the Gulf of Honduras) is known as "Honduras" mahogany. The latter timber is coarser in grain than "Spanish" mahogany. T. E. C.

Queen's Hall.

Chatham.—J. S. A. writes: "Has the Queen's Hall, Langham Place, been illustrated?"

Two full-page illustrations, with a plan of Queen's Hall, appeared in the "Builder" for February 14th, 1891. It may also be found mentioned, with a plan, in a paper on concert halls and assembly rooms in the "Building News," April 17th, 1896. G. A. T. M.

Compensation for Delay due to Strike.

Striker writes: "A builder contracted to alter premises and complete within six weeks. When he signed the contract he had received notice of a strike to commence one month ahead. He omitted to inform the building owner and his architect of this impending strike, as he might not have got the work (the owner and architect were not local and knew nothing of the strike). The usual contract form was used. The owner now claims compensation for damage, as he had engaged staff and ordered stock, and the work is still standing unfinished. What is the builder's position; can he shelter under the strike clause? The owner could have given work to another contractor to carry out who was not affected by the strike."

As an expression of opinion, it is considered that the builder can claim an extension of time for the delay due to a strike occurring during the progress of the work. T. E. C.

Payment for Overtime.

Essex.—Honorarium writes: "What would be a fair rate of remuneration per hour for overtime work in the preparation of one-eighth scale and working drawings for schools, residences, offices, &c., &c. The architect in whose employ I am pays me a salary of £102 per annum and offers 1s. per hour remuneration for overtime work. Is not this a rather small amount? What could I fairly ask per hour?"

More friction between employer and assistant arises over the question of overtime than almost anything else for want of a clear understanding upon the point when the assistant is first engaged. It is purely a matter for special arrangement, and if no arrangement has been come to the assistant is under the necessity of accepting whatever his employer may offer unless he is prepared to throw up his berth—with the added risk of being stigmatised as "unwilling" in any testimonial or recommendation for which he may apply. In very many offices it is the rule not to pay at all for overtime, but to increase the salary, if an increase be demanded, to a sufficient extent to compensate. If the overtime, however, is quite occasional and varies in duration, payment at the same rate as for daywork plus a sufficiency to pay for any meals taken at a restaurant instead of at home is fair remuneration for the first two or three hours per diem. After that time the strain becomes more severe, and it is only reasonable that time-and-half should be paid up to midnight, and double-time after midnight. G. A. T. M.

Thrust of Roof.

Sunderland.—Enquirer writes: "The sketch herewith shows a roof over 31ft. span. Will there be any thrust outwards on the walls? Will the 11in. by 3in. rib counteract the thrust if bolted to 9in. by 3in. collar and 9in. by 3in. principal by setting up a strain in rib alone? In Middleton's "Strains and Stresses," p. 111, he says that it will not: 'It cannot change the direction or lessen the amount of the thrust against the top of the wall until such thrust becomes active by the spreading out of the walls.' If Mr. Middleton is right, then the thrust will be resolved into the wall and buttress combined."

In the truss shown, if the parts be properly fitted and bolted up tightly, there will be practically no thrust on the walls due to the spreading of the feet, but it is desirable to strengthen the walls by buttresses where the trusses occur to provide against faulty workmanship and to improve the appearance. The design of truss is imperfect, as will be seen by reference to the frame and stress diagrams where the members 10–11, 11–13 and 13–14 are found to have no stress, and might therefore be omitted. In the diagram the 11in. by 3in. rib has been slightly extended to avoid a cross strain on tie beam, but otherwise the outline fairly represents the course of the stresses. Thick lines show compression. HENRY ADAMS.

An Old Architectural Book.

London.—Interested writes: "I recently bought an interesting old book entitled 'The Architecture of Leon Batista Alberti in Ten Books, of Painting in Three Books, and of Statuary in One Book; translated into Italian by Casimo Bartoli and into English by James Leoni, Architect; illustrated with Seventy Five Copper Plates, engraved by Mr. Picart, in One Volume. London, MDCCLV.' The volume measures 16½in. by 10½in., is in a perfect state of preservation, and bound in worn brown leather. The plates are well engraved and peculiar, and the 276 pp. of writing exceedingly old-fashioned and amusing reading, the last word on each page being reprinted at the head of the following page, as in old MS. I should be interested to know if this work is of any real value, and whether the architect or his translator are famous."

The author, who was born in 1405 and died in 1472 A.D., was one of the greatest architects of the Italian Renaissance, and did much towards the revival of strict Classic architecture. His most important buildings were the Palazzo Rucellai and the Gate and Corinthian Logia of Santa Maria Novella at Florence, the church of San Francisco at Rimini, and the churches of San Sebastino and San Andrea at Mantua. Yet, although his buildings were of importance and considerable beauty, his book had even a higher reputation, and during the eighteenth century was considered the greatest authority on the Italian architecture of the fifteenth. The Royal Institute of British Architects possesses a copy in Italian, but not in the original binding. English translations are both rare and valuable. The translator, James Leoni, does not appear to be of great note. The original was written in Latin. G. A. T. M.

Stone Pillar.

Gloucester.—P. L. writes: "What is the reason that one of the pillars in the nave of one of our churches is perished up a distance of about 12ft. It faces the south porch, and there is a large stove about 10ft. away from it, but it is perished all round. All the others are perfect. I think they are built of local stone."

Without personal inspection, which might reveal some other cause, it can only be suggested either that at some time in its history the pillar in question has been exposed to the weather, or that it was built of a different stone of inferior quality to that employed for the rest of the church. G. A. T. M.

Life of Rickman.

Leeds.—E. B. writes: "Who is the publisher of the 'Life of Rickman, by his Son'?"

"Notes on the Life and on the Several Imprints of the Work of Thomas Rickman, F.S.A., collected by his Son, Thomas Miller Rickman, F.S.A.," has ust been issued. The publisher is Mr. George . W. Pitman, of 140, Gower Street, W.C., and he price is 5s.

Society of Architects' Examination.

Bradford.—A. H. W. writes: "What books hould I study for the examination of the ociety of Architects, and is this examination eld in the North, and could I obtain a copy of he last examination paper?"

Full particulars can be obtained from the ecretary to the Society of Architects at St. ames's Hall, Piccadilly, W.

Roof Truss.

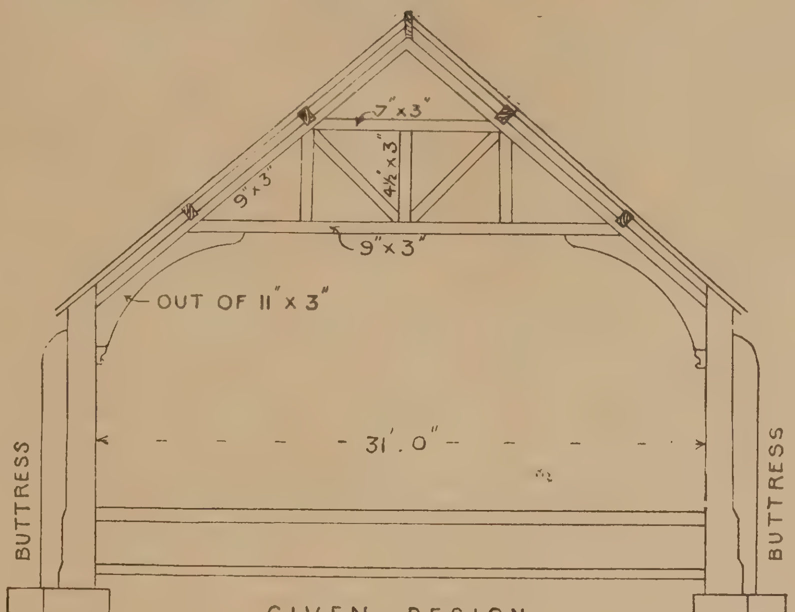
Newbury.—Enquirer writes asking us to answer an examination question requiring the explanation of what a reciprocal diagram is and giving one for a king-post roof.

We cannot spare space to answer such elementary questions as this; our correspondent is idently entirely ignorant of the rudiments applied mechanics, and to teach him would require us to repeat what is to be found in all the text-books at great length. He should consult either Rivington's, Allen's or Mitchell's books on building construction. If he intends to go in for building scientifically and thoroughly he should study the books on theoretical mechanics recommended on p. 122 of our issue for March 20th last.

Nuisance from Shows.

Cornwall.—An Old Subscriber writes: "The medical officer of an urban district council reports to the council that he has received complaints from residents near a field in such district which has been let by the owner to be used for steam roundabouts, hobby horses, shows and circuses both as to the noise and bad smells caused by such shows, &c., and calls the serious attention of the council to what he describes as grave objections both from a sanitary point of view and for other reasons. I presume the council can make by-laws and regulations controlling the tents, vans, sheds, &c.; but can they under section 91 of the Public Health Act, 1875, prevent such shows, &c., from being held in their district, and what steps should they adopt?"

The district council would do best to consult the Local Government Board and follow its advice. G. A. T. M.



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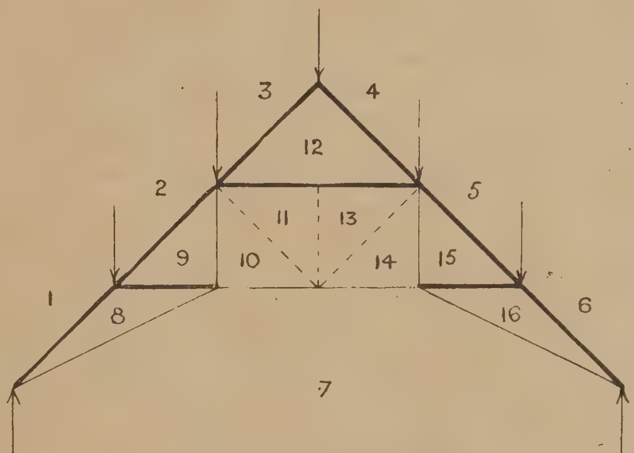
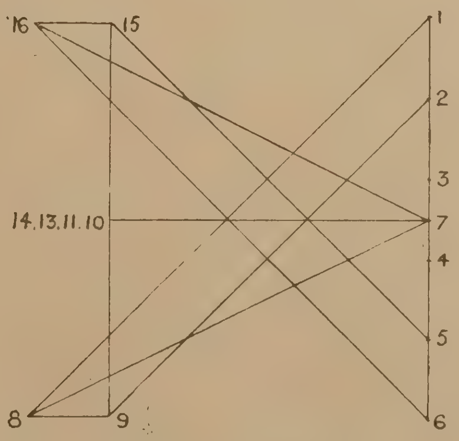


FRAME DIAGRAM



STRESS DIAGRAM

THRUST OF ROOF.

Correspondence.

South Kensington Examinations.

To the Editor of The Builders' Journal.

Bromley, Kent.

Sir,—Referring to the correspondence on p. 422 of your issue for July 3rd re stone window sill, question 9, it is a pity you allow such a badly informed "expert" to occupy space in your valuable paper with such a solution of a stone sill as given by him on p. 366 of your issue for June 12th, and then to assert as he does in the issue for July 3rd that it is undoubtedly a better "job than a narrow sill with a metal tongue!"

Surely the South Kensington authorities would not advocate the use of this form of sill, which is wasteful and bad, for a more successful method for rotting the woodwork could not easily be devised. I also note in the same issue (p. 424) a section of a wood sill which the writer calls a "good" section; surely it would be a very poor affair not to be sunk and throated in addition. —Yours truly, J. E. J.

Kirkcaldy.

Sir,—I scarcely think Mr. Harrison's criticism has been fully appreciated, nor do I think the explanations given on p. 422 in your issue of the 3rd inst. could have been written by one conversant with the subject. In question 10, for instance, no sane person would adopt such a primitive or inexemplary method of fixing an eaves gutter on a new building, especially where a dressed stone eaves course is provided. The necessity of the packing pieces under the ceiling joists is ludicrous, when by simply laying the joists directly on the wall plate the work is done, and done as it should be.

In question 12 you seem to be quite mistaken in your application of the term "coursed" rubble to the class of walling referred to.

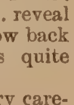
Neither is your illustration of solution to question 9 in order. There is no occasion for the stone sill projecting so far into the room, and few people would consider it prudent to sink the top surface so far back for the mere sake of forming the small lip, which to my mind is not to be compared with the efficiency of the metal tongue. The latter should exclude both wind and water, while the former would scarcely be proof against capillary attraction should the water get so far back. The wall in the recess is given as 10in. thick in the question, which with a 4½in. reveal and say 6in. for window causes the window back to be ½in. inside the recess, which is quite sufficient.

Altogether I think students should very carefully think over these answers before accepting them as correct.

J. FORBES SMITH, A.R.I.B.A.

Hertford.

Sir,—With reference to solution of question No. 9, is not Mr. Harrison quite right in saying that the stone sill as shown is a simple waste of material, when for the sake of a water bar a good deal of stone could be saved, which though not much in one sill, yet would soon mount up in a house with many windows. Also in answering Mr. Harrison you say that "it is undoubtedly a better job than a narrow sill with a metal tongue," but you do not give any reason for it being so. Would it not have been better if Mr. Harrison had put the water bar ½in. from the outside face of the oak sill as it would better prevent the rain when driven against the joint from penetrating any great distance under the sill and so rotting it (see sketch)? There would also be a saving in stone.—Yours truly,



S. H. J. MURCH.

The criticisms of the answers to the South Kensington questions have been interesting.

Our expert regrets that what he says does not meet with J. E. J.'s approval. He claims to be a tolerant man himself, and if he had had the marking of the papers he would have given full marks for a solution like that of Mr. Harrison. He says that an iron tongue in a ploughing is worse for the wood than no ploughing and no tongue; that in his view the method, like some other modern methods, is not an improvement. For ourselves we regret that our correspondent cannot give us unqualified approbation. This particular expert happens to have commenced his active professional work, after a university course, as a *foreman mason*, which may account for his partiality for stone; he is actively engaged as an architect, having buildings of some importance on his hands. He is, among other things, a Member of the Institution of Civil Engineers and a Gold Medallist in Science of a University, and if he leads some of our younger readers astray it ought not to be "because he knows no better." The sill shown on p. 424 is throated; it was a draughtsman's error to omit the sinking.

Mr. J. Forbes Smith, who says "No sane person would adopt such a primitive or inexemplary method," exhausts his bitterness with his first stroke. With his last sentence we cordially agree, "I think students should very carefully think over these answers before accepting them." These answers are not dogmatic doctrines and have no claim to infallibility; they are answers prepared by a practical man from the point of view of his own experience, and nothing that has been said affects his expressed opinion to change it in any degree. Mr. Harrison's proposal to rest his eaves gutter on stone corbels is a perfectly good plan; but in some cases where it is necessary to exercise economy, iron gutter hooks are used, and very much used. Economy of this kind is legitimate if it involves no permanent injury to the building, and it does not allow water to be conducted into the wall as is frequently the case when an iron eaves gutter is laid on a continuous course, and there is leakage at the joints of the iron gutter. If two or three extra inches of height of ceiling can be gained as shown in the answer, it is wise to gain these two or three inches of ceiling.

In regard to Mr. S. H. J. Murch's criticism both of Mr. Harrison's proposal and of ours, and his proposal to place "the iron water bar within half an inch of the outside face," he carries economy much too far. Long experience of oak sills has satisfied us that it is not at the side they rest upon that decay begins. They do not decay there at all. They fail on the top from wetting and drying, and it is precisely for this reason that we advocate the through stone sill. If in time there is a through shake which reaches behind the water bar, of what use is the water bar? Economy is no doubt a good plea, but there is "that which withholdeth more than is meet, and it tendeth to poverty."

We make no assumptions in regard to our correspondents' "sanity," length or character of experience. We are accustomed to curious differences of opinion about very simple matters. It is well to have these differences expressed in moderate language, setting a good example to students, who will, we hope, "think over these answers before accepting them." We strongly advise students to develop good common-sense opinions of their own. They can only succeed in this by observing practical building operations and comparing what they see with what they hear. We are accustomed to an assumed antagonism between "theory" and "practice." We know that we can have neither by itself, but practice, actual experience, gives proportion to our ideas in a special necessary way. Our business is not controversy. We have given our opinion, and we have given our reasons at sufficient length on these small questions in the Elementary stage.

There were also some small errors which escaped our expert in the proofs of the last article on these examinations: page 446, middle column, line 3, ¾ft. × 18ft. × 5¼ft. gables should be ¾ × 18ft., &c.; lines 11, 12, 13, 14, 15, first factors of lines should be 2, 4, 3, 2, 2 without ft. There is an error of arithmetic, third column, same page, 19ft. × 14ft. × 1·16 (sec. 30°) = 3 squares 8ft.; this will increase the estimate by £2 11s. 8d., making the total £156 5s. 2d.

New Streets.

To the Editor of The Builders' Journal.

Godalming.

Sir,—In reply to the enquiry by "One in Difficulties" on p. 423 of your issue for July 3rd, he should surely have been told that it is possible for an old highway to become a "new street" within the meaning of section 157 of the Public Health Act, 1875, and that in such a case the by-laws of the local authority will apply. In case of dispute this becomes a question of fact for the magistrates to determine.—Yours faithfully, J. H. NORRIS.

Gilford v. Taylor.

To the Editor of The Builders' Journal.

Wandsworth, S.W.

Sir,—Your verson of this case mentioned in your issue of June 26th, p. 401, is not correct. The facts I notice are not disclosed, and the result as stated would lead your readers to infer that, having employed the plaintiff to prepare certain plans, I had improperly refused to pay his claim and had been ordered to do so. What occurred was that the plaintiff having sent me in an account for £69 7s. for work and plans which I considered unsuitable and unworkable it was referred to Mr. Hilton Nash to say whether the plaintiff was entitled to this amount, and he, after looking at the plans, awarded him £37 10s. in lieu of the £69 7s. claimed.—Yours obediently,

GERTRUDE E. TAYLOR.

A NEW COTTAGE HOSPITAL FOR ABERGAVENNY.

A NEW Cottage Hospital is being erected at Abergavenny, in Hereford Road, adjoining and overlooking Bailey Park. The hospital, which consists of three wards (accommodating seven beds and two cots) together with the dispensary and all offices in connection therewith is on the ground floor, thus facilitating and greatly economising working arrangements. An operating-room is provided having all the most modern sanitary arrangements. There are no square corners or angles. The floor is to be paved with jointless terrazzo and the walls lined with glazed tiles. The indispensable north light is provided, together with special means for ventilation. There are lobbies having cross ventilation to all w.c.'s and lavatories, and there is also a small laundry and mortuary in connection with the outbuildings. The matron's room adjoins the front entrance, and the doctor's consulting-room and the dispensary, a separate entrance being provided for this department although in communication with the main building. On the first floor accommodation is provided for a parish nurse, together with bedrooms and other conveniences for the staff. Externally the building is of best pressed brickwork, the roof being covered with Broseley tiles. The building is of plain and economical construction. The contract, amounting to £1,925, has been let to Messrs. J. G. Thomas & Sons, the design being by Mr. E. A. Johnson, F.R.I.B.A., architect, of Abergavenny and Merthyr. It is expected that the building will be ready for occupation within twelve months.

WORKMEN'S DWELLINGS SCHEME FOR MIDDLESBROUGH.

THE General Purposes Committee of the Middlesbrough Corporation recently adopted the report of a sub-committee with regard to the provision of working-class dwellings. They recommended the adoption of the site offered by Messrs. Robson & Punch as set out on the borough engineer's plan. The area of the land, which is at Linthorpe, is about 20,000 sq. yds. The report stated that the borough engineer had drawn out a plan for laying out the land to the best advantage with the two types of houses approved by the General Purposes Committee and in accordance with the requirements of the Local Government Board, but, of course, their formal approval would have to be obtained to the scheme. The houses had been arranged upon the plan with front and back streets, there being ninety-eight houses of one type (block A), four-roomed, with a 15ft. frontage, and thirty-three houses abutting on the front roads, with set-back gardens of another (block B) type, six-roomed, with 17ft. 6in. frontage. The cost of these houses, blocks A and B, based upon the contract price for the gasworks cottages, will be about £158 per house for block A and £190 per house for block B; total cost for buildings only,

£21,754. The total cost of the whole scheme will be £29,350. The interest at 3½ per cent. and redemption for thirty years the sub-committee put at £1,595 18s. 2d. or £5 8s. 9d. per £100. The sub-committee reported that they considered that there is every reason to believe that there will be a considerable demand for these houses as fast as they are built. The block A will readily let at 5s. 6d. per week with a passage through, and block B at 7s. 6d. per week—ninety-eight houses block A at 5s. 6d. per week, £26 19s.; thirty-three houses block B at 7s. 6d. per week, £12 7s. 6d.—£39 6s. 6d. per week, That would give a gross income of £2,044 18s. per annum. The rates at £2 10s. per annum for the 5s. 6d. houses, and £5 per annum for the 7s. 6d. houses, would amount to £410, and the income tax at 1s. 2d. in the pound to £75 2s. 8d., leaving £1,559 15s. 4d. nett income, from which losses for empties and repairs must be deducted. In the Richmond cases that amounted to less than 1s. per £100.

QUEEN VICTORIA MEMORIAL.

THE Committee on the Memorial to Queen Victoria have met again. All the official plans and models have been under consideration, and in addition one important unofficial proposal received considerable attention. This, it is interesting to know, although it did not come from an architect, is one of the most ambitious of the many unofficial schemes which have been laid before the committee. The author is Mr. Lennox Browne, who, although he is better known as a throat specialist, is also a distinguished art amateur and a connoisseur. Mr. Lennox Browne's proposal is a very elaborate one, but it may be said briefly to consist of an adaptation of Buckingham Palace to the purposes of a memorial, by the addition of a storey at each end, the erection of a lofty central roof, and the facing of the building in red brick and stone. This would make a background, according to Mr. Browne's plan, for a great avenue leading from the east end of Piccadilly, opposite Devonshire House, to the Palace, in the line of the present footpath, while he further suggests an opening into Trafalgar Square. The forecourt of the Palace would be extended into a great semi-circle with arches emblematical of Great Britain's colonies. Mr. Browne also proposes to limit the statuary to a memorial to the Queen, and that, as is known, has been entrusted to Mr. Brock. It is interesting to note that several of the Colonial Agents-General have spoken enthusiastically of that portion of the scheme which provides for a series of Colonial arches. It does not follow, of course, that this or any other scheme will be adopted by the committee. It is stated that at a further meeting on Wednesday last the committee selected from among the plans submitted those which they considered most suitable. It is further understood that as a preliminary to publication of the name of the successful competitor and of details of his plans, the selected scheme will have to be submitted to the general committee and afterwards approved by the king.

Masters and Men.

A Master-Builders' Association for Malton has been formed. Mr. Anthony Lyon, of Norton, has been asked to become the president, and Mr. Horsley has been elected hon. secretary.

Tees-side Joiners' Dispute settled.—After lasting several weeks the dispute between the Tees-side and Hartlepool Master Builders and the Tees-side District of Operative Joiners has been settled. First of all the men asked that their wages should be advanced from 9d. to 10d. per hour, but this the masters declined, offering ½d. The men refused this, and since negotiations have been repeatedly opened with the view of coming to a settlement. Eventually the masters offered an advance of ½d. per hour, conditionally upon the rules of working being altered, and that those in force in the Sunderland district be agreed to. A settlement on this basis has been agreed upon.

Keystones.

It is proposed to place in Looe Church an oak organ screen specially designed by the architect of the church to cost about £65 to commemorate the ministry of Rev. A. Kemble.

Architectural Association Day School.—Mr. Arthur T. Bolton, A.R.I.B.A., has been appointed Master of the Architectural Association Day School which will be opened at 56, Great Marlborough Street, W., in October next.

A New Partnership.—Mr. G. G. Pye, M.S.A., architect and surveyor, of 12, Paternoster Row, E.C., has taken Mr. F. V. Forrest, an architect late in practice at Hounslow, into partnership. The firm will in future be known as Pye & Forrest.

A Memorial Oak Pulpit to the late Lady Protheroe Smith has been placed in St. Paul's Church, Truro, from designs by Mr. Fellowes Prynne, of Plymouth, and matches well the screen erected by Canon Gardiner to the memory of his wife.

The Birkenhead Town Hall caught fire last week. Although the main building stands intact the upper ornamental portion of the tower has been partially destroyed; the fire having cut down the tower by about 30ft. The left front of the hall in which the fire originated was utterly wrecked.

Kenchester Church.—The rector of Kenchester, Herefordshire, states that his ancient church is in danger of collapse and is in a general state of dilapidation. Kenchester is said to be the earliest city in this country built of stone, and it had a large pretorium adorned with Doric colums. It was the Magna Castra of Julius Cæsar, and from its ruins the present church was built about the time of the Conquest. The font was formed from a section of one of the Doric pillars of the pretorium.

A Plan of Glasgow and the International Exhibition there has just been published by Messrs. W. & A. K. Johnston, Ltd., of London, Edinburgh and Glasgow, price 6d. It is extremely well got up, and will be found most useful for all visitors to Glasgow. It contains a large size map of the city on one side and on the back a small ground-plan of the exhibition, with numerous particulars and information with regard to the exhibition, places of interest, cab fares, &c.

The Hotel Cecil.—In the improvement of the Hotel Cecil by the erection of the north block, besides giving the hotel an imposing frontage on to the Strand and about 100 more bedrooms, the company acquires a row of shops in the street, a first floor of large offices, and a second floor of bachelor chambers, all of which will no doubt be let as soon as they are ready for occupation. When the facade is finished the lofty archway will be higher even than that of Burlington House. It was in order that this archway should be in the centre that a small wing of the block has had—temporarily, at any rate—to be left out of the general scheme of decoration. The six upper floors of the block are to be used by the hotel, so that between 900 and 1,000 guests can be received instead of 800.

The Bradford Board of Guardians at a recent meeting considered the question of appointing Mr. Fred Holland as architect and civil engineer for the workhouse for four years. Mr. Halford moved as an amendment the appointment of an architect be referred back. He said that he did so because he understood that the post had not been advertised, and he urged that such an appointment ought not to be made without open competition. The chairman said that Mr. Holland had been employed in connection with the works which had already been carried out at the workhouse, and had drawn the block plans for the new buildings, and it was natural and proper that he should be selected to carry out the work. There was a good deal of work in prospect, and consequently it seemed to the committee that there would be an actual saving if Mr. Holland were appointed at a salary for the next four years. After some further discussion the amendment was negatived and a notice given that at the next meeting a motion would be made for the appointment of Mr. Holland.

Little Waldingfield Church.—In this article in our last issue, the name of Mr. E. M. Hick was spelt wrongly.

Mr. Dan Gibson informs us that he was in no way responsible for the design for the houses at Windermere by Mr. Thomas H. Mawson, illustrated in one of our centre plates last week.

A New Roman Catholic Church of St. Joseph, at Skerton, near Lancaster, has been built from designs of Messrs. Pugin & Pugin, London and Liverpool. One great feature of the church is its tracery windows.

Roath Wesleyan Church is to be renovated, and tenders are being invited for the work. It is proposed to reglaze the windows with lead light glazing, and decorate the interior, and to substitute electric lighting for gas. Messrs. Habershon, Fawckner & Greaves, of 41, High Street, Newport, are the architects.

The Abersychan English Baptist Church is being added to and altered. The chapel is being enlarged, and new schools and class-rooms are being added. Mr. Charles Shopland, of Maindee, Newport, Mon., is the builder, and the architects are Messrs. Habershon, Fawckner & Greaves, of 41, High Street, Newport.

A Parish Room is to be erected at St. James, Clapton, on a piece of vacant ground on the south-west side of the church, capable of holding about 400 persons, with smaller rooms attached, to be used for parochial purposes. The estimated cost of the building is about £1,700. A faculty was granted by the Consistory Court of London last week.

A New Welsh Presbyterian Church, at Builth, is proposed to be erected on the site of the Alpha Church, one of the first in the Connexion built, and which has been added to twice during its existence. The new church will be designed in the decorated period Gothic, and will afford a seating capacity of 600. The architects are Messrs. Habershon, Fawckner & Greaves, of 41, High Street, Newport.

A New Fire Brigade Station at Dublin is being erected in Dorset Street. It has a frontage of 68ft. and contains a working department and house accommodation for an officer and six married men and their families. The working department consists of an engine-house, to contain a horsed escape and hose carriage combined, an ambulance carriage, with stalls for four horses; on the first floor a large dormitory over the engine-house, with bathroom and lavatory. Stable and engine-house have quick-opening doors. The total cost of the building when complete will be about £7,500, and Irish materials have as far as possible been used.

New Buildings for the General Accident Assurance Corporation, Limited, were formally opened at Perth recently. The buildings will cost £25,000 or £26,000. The building occupies the site of the old post office. The ground floor of the offices is almost entirely taken up by the general office, where there is seating accommodation for 100 clerks. On this floor there are also assistant manager's room, telephone room, post office, &c. The first floor contains a second large apartment, with accommodation for about fifty clerks. There are also rooms for the heads of the departments, boardroom, anteroom and the general manager's office. On the second floor are extra clerks' rooms, keeper's house, clerks' luncheon room, kitchen and other accommodation, while the attic floor is used for storage.

Mr. Pearson Bellamy, an architect, has died at his residence in Tentercroft Street, Lincoln, in his eightieth year. The deceased gentleman was born at Louth, and was articled to the late Mr. Nicholson at Lincoln, and he subsequently gained much useful experience as an assistant in Manchester and Liverpool. Mr. Bellamy afterwards commenced partnership with Mr. Hardy, which had a long existence. The deceased gentleman was well-known as an architect in connection with town halls, corn-exchanges and cemeteries. One of his chief buildings was the Ipswich Town Hall, which has been much admired. His principal cemeteries were those in Leicester and Loughborough, while the Corn Exchanges at Hull, Lincoln, Grimsby and Retford stand out as memorials of his skill in that direction.

The St. Andrew's Schools at Wigan are now being extended at an estimated cost of £1,400.

The French Architect Pichat, it is announced in a Bohemian newspaper, has been commissioned by an order of monks appertaining to the Grande Chartreuse to superintend the construction of a vast convent with great industrial dependences.

Presidential Busts.—It is not generally known that it has become a tradition for the Presidents of the French Republic to give a copy of his bust to each Minister who serves under him. The busts are manufactured at Sèvres, and when Ministerial changes are frequent the famous factory is kept busy.

A New Mission Church at Lynn dedicated to St. Michael and All Angels has been erected at a cost of £1,500. The building is built of red bricks with stone dressings, and will accommodate nearly 400 worshippers. Attached to it is an infants' school for 173 children which has cost about £900, and the total expenditure has been about £2,500.

A French Monument.—Owing to the prolonged illness of the architect who was commissioned to design the pedestal of the monument to M. Jules Simon, the inauguration will not take place before March of next year. M. Denys Peuch has finished the statue, which is in white marble, and it will be erected in Place de la Madeleine.

The City Imperial Volunteers are now receiving the medal which has been struck for the Corporation of the City of London to commemorate the services of the regiment at the front. One side of the medal shows an Imperial Volunteer receiving the City's freedom, while heralds on either side of him sound a call to arms, which is answered by marching figures in the distance. Above the central figure is a scroll with the legend, "Pro Patria, Regina, ét Urbe." On the other side a hill symbolising the British Empire, and surmounted with a staff flying the Union Jack and the C.I.V. flag, stands out against the rays of a blazing sun. At the base of the hill are young oak trees, symbolical of the new British South African Colonies. The medal was designed by Mr. G. J. Frampton, A.R.A.

New Wesleyan Chapel at Stapenhill.—The estimate of Messrs. Thos. Lowe & Sons at £2,240 for the erection of a new chapel and school buildings in Ferry Street, has been accepted, and work will be commenced immediately. The chapel, which is designed in the Early English style, provides accommodation for 400 adults, and consists of a central aisle and two transepts, with entrance vestibules. The north transept is designed to accommodate the organ. The school will contain 300 children, and in connection therewith are cloak rooms and lavatories. At the back of these buildings are provided vestry, kitchen, and heating chamber, &c. The work will be executed in red brickwork and white stone dressings, the main feature of the chapel font being a large four-light tracery window. The whole of the roof timbers inside will be of pitchpine and will be exposed, being stained and varnished. The architect of the work is Mr. Thomas Jenkins, of 35, High Street, Burton-on-Trent.

St. Mary's Church, Black Torrington.—A meeting of Black Torrington parishioners took place recently to consider questions relating to the restoration of St. Mary's Church, Black Torrington. Rev. J. J. Gardiner presided. The chairman stated that £519 had been received and promised, and also that the chancel would be restored by himself at a cost of from £400 to £500. The Rev. Medley Fulford was elected as the consulting architect, and L. H. Reichel, architect, of Beara Court, promised his services gratis as second architect. Mr. Reichel then briefly described the work to be done: (*a*) roof to be taken off; (*b*) walls to be made upright and strengthened by buttresses; (*c*) roof to be covered with English oak boarding, then with deal boarding, then with felting, and finally with best quality Broseley tiles; (*d*) concrete floor and new seating; (*e*) the whole building to be made damp-proof, and additional spouting to be placed around it. A discussion as to whether tiles or slates should be used then took place, and it was decided, with one dissentient, that tiles of the best quality be used.

Mr. S. D. le Roux, architect, Salisbury, has received instructions from the Standard Bank to prepare plans for the new banking premises at Beira.

The Memorial to the late Dean Boyle of Salisbury will take the form of a mural tablet with medallion portrait and stained glass windows in the lady chapel of Salisbury Cathedral.

Housing at Wellington.—A Local Government Board inquiry was held recently into an application by the Wellington Urban District Council to borrow £1,200 for land, and £3,000 for the purpose of building workmen's dwelling upon it.

A New Church at Oystermouth is to be erected by Messrs. Howell & Son, Cardiff, at a contract price of £4,758. The architect is Mr. Bruce Vaughan, Cardiff. The site of the proposed church commands a fine view of the Bristol Channel. The total cost will be nearly £6,000.

A Pulpit in the Parish Church of Longford, Derbyshire, erected two years ago, has just been completed by the addition of several statuettes carved by a lady. The figures include those of St. Chad of Lichfield, St. Aidan and the Venerable Bede, and distinctly enhance the appearance of the pulpit. The carving has been executed by Mrs. Alfred Hobhouse.

The Leeds Insanitary Area.—Last week the Select Committee of the House of Commons considered the Bill of the Leeds City Corporation, which seeks the confirmation of an Order, already granted by the Local Government Board, under the Housing of the Working Classes Act, 1890, for the improvement of the district of Quarry Hill, which is an alleged insanitary area. The Order was confirmed, with the exception of Wray's Yard.

A New Hotel on the East Coast has just been erected for the Coast Development Company at Southwold, which is situated about 12 miles south of Lowestoft. The hotel consists of a main block, nearly 150ft. in length and of six storeys in height, with an annexe extending nearly the whole length of the building. The main block facing the sea contains the principal public rooms, the lounge, dining-room, reading-room, drawing-room, and visitors' rooms. The interior is lighted throughout by electric light. The grounds consist of about 2 acres. The marine parade in front of the hotel is now being extended and laid out by the company in conjunction with the Corporation of Southwold, and on the completion of this the shore end of the pier will be finished.

Grimsby's Almshouses.—A little over seven years ago one of the most extensive schemes of almshouses in Grimsby was commenced, a scheme which should provide for the housing of about 200 aged and infirm, or widows and their children. The scheme is now nearing completion. Thirty-two almshouses have been already erected and paid for, and they are now occupied. Six more of the larger class of house are now being built, and it is intended to build ten smaller houses next year. The two classes are a large six-roomed house in two storeys for widows and their families, and a smaller two-roomed house of one storey for the aged couples. The small houses cost £75 each, and the larger ones about £130 each. At present there are twenty small houses and twelve large ones. Six large houses are to be put up this year, and ten small ones next year, which will make the number up to forty-eight.

L.C.C. Central School of Arts and Crafts.—The annual exhibition of students' work at this School, 316, Regent Street, W., was opened to the public free last Monday, and will be open throughout the week from 10 to 8.30 daily. During the fifth session, now closed, more than 700 individual students have been in attendance, mostly journeymen or apprentices in artistic trades. The work to be exhibited comprises bookbinding, stained glass, enamelling silversmiths,' goldsmiths' and jewellers' work, chasing, engraving, moulding and casting in metal, wood-carving and gilding, writing and illumination, embroidery, lithography, woodcuts in colour, architectural design, furniture design, cabinet work and wood-inlaying, drawing, modelling, and designs for various processes. It will be remembered that a site for the new building was recently allotted by the London County Council for this very successful school which has quite outgrown the present temporary premises.

New Business Premises are in course of erection at Newport, Mon., for Messrs. Davies & Co. and Z. P. Handford, at a cost of £16,000. The facade, which is 114ft. in length and five storeys in height, is of freestone, and flanked with two large domes. It is proposed to have the shop front in brass. Lifts, worked by gas engines, will be provided to raise the stock from the basement to the several floors. Electric lighting will be used throughout. The kitchen department will be on the top floor, which will be fitted with the most economical system of cooking, &c. The contractors are Messrs. E. C. Jordan, Newport, Mon., for masonry, plastering, and ironwork, and G. Martin, Newport, Mon., for joinery and ironmongery. The architects are Habershon, Fawckner & Groves, 41, High Street, Newport, Mon.

New Companies.

May & Padmore, Ltd.

Registered July 1st to acquire the business carried on at Leopold Street, Stanhope Street, and St. George's Place, Birmingham, and elsewhere, as May & Padmore, and to carry on the business of brassfounders, engineers, ironfounders, joiners, cabinetmakers, carpenters, builders, metal workers, manufacturers of brass, iron and metal goods, &c. Capital £30,000 in £5 shares. The first directors are W. J. May, N. C. Reading, A. Blackwell and W. F. N. May. Registered office: 123, Leopold Street, Birmingham.

Artificers' Guild, Ltd.

Registered July 2nd to acquire the business of a metal-worker carried on by N. E. Dawson at Chiswick, and to carry on the business of metal-workers, designers and makers of presentation caskets, memorial tablets, ornaments, furniture, and utensils, &c. Capital £6,000 in £1 shares. The first directors are N. E. Dawson, E. N. Hitchcock-Spencer and R. Rigby. Registered office: Wrought Metal Worshops, Oil Mill Lane, Hammersmith.

C. H. Taylor & Son, Ltd.

Registered July 4 to acquire the business carried on at Cyclops and Alexandra Foundries, Kirkstall Road, Leeds, as C. H. Taylor & Son, to carry on the business of ironfounders, engineers, bridge builders, boiler-makers, metal-workers, metallurgists, &c. Capital £10,000 in £1 shares (5,000 preference). The first directors are W. G. Taylor, W. H. Billington and T. H. Newsome. Registered office: Cyclops Foundry, 22, Sale Street, Leeds.

Thomas Clough & Sons, Ltd.

Registered July 6th to acquire the business carried on at Howley Park, Morley, West Ardsley and Calverley, Yorkshire and elsewhere, by Thomas Clough, as Thomas Clough & Sons, and to carry on the business of stone quarriers, builders, dealers in marble, granite, stone, sand, gravel, clay, marl, brick-earth, bricks, tiles, pavings, kerbs, pipes, earthenware, &c. Capital £20,000 in £50 shares. Registered office: Cardigan Quarry, Morley, Yorkshire.

G. Stocker & Co., Ltd.

Registered July 6th to continue the business carried on by G. H. Stocker, and to carry on the business of gypsum miners, manufacturers of Keene's and Parian cement, floor plaster, plaster-of-Paris, terra alba, mineral white, gypsum and plaster stone, &c., farmers, cattle breeders and dealers in live stock. Capital £2,000 in £1 shares. The first directors are G. H. Stocker and A. Barlow. Registered office: Gotham, Notts.

J. Romans & Co., Ltd.

Registered July 5th to acquire the goodwill of the business carried on at Llanthony Road, the Docks, Gloucester, as J. Romans & Co., and to carry on the business of timber growers, merchants, benders and sawyers, sawmill proprietors, timber surveyors, carpenters, joiners, cabinet-makers, packing-case manufacturers, wood-carvers, turners, &c. Capital £15,000 in £10 shares. The first directors are C. E. Brown, G. Merrylees, A. F. Hobbs and J. Romans. Qualification, £200. Remuneration as fixed by the company.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ALDERSHOT.—For the erection of certain buildings and shaft in connection with their electric lighting station, situate at the Parish Clerk's Land, Aldershot, for the Aldershot Urban District Council. Mr. Nelson F. Dennis, A.M.I.C.E., surveyor:—

Shaft.

Bateman & Son	£1,112	Martin, Wells & Co.	£989
G. Kemp, Aldershot	1,025	Mussellwrite & Son	898
R. H. B. Neal	998	Spear & King*	795

Buildings.

W. Garland	£3,329	Spear & King	£2,850
Martin, Wells & Co.	2,931	Mussellwrite & Son	2,723
Bateman & Son	2,868	G. Kemp*	2,695

* Accepted.

BARKING.—For alterations and additions to the "Stag" Beer-house, Ripple Road, Barking, for T. W. Glenny, The Brewery, Barking. Mr. Theodore Gregg, architect, 1A St. Helen's Place, E.C.:—

Barrett & Power	£875
J. Bentley	765
G. L. Kirby,* Holloway	753

* Accepted.

BARNSTAPLE.—For alterations and additions to the "Royal and Fortescue" Hotel, for Mrs. Jones. Mr. Arnold Thorne, F.R.I.B.A., F.S.I., architect, 16 Cross Street, Barnstaple:—

Sanders & Karslake	£2,220 10	Barwick & Lillifant	£1,953
Bryant & Thorne	2,181 0	H. Burgess	1,895
W. Slee	2,015 0	Tucker & Lillifant*	1,870
Woolnay & Sons	1,961 0		

[All of Barnstaple.]
* Accepted.

BEXLEY HEATH (KENT).—For the erection of four private houses, Crook Log, Bexley Heath, Kent. Mr. E. Box, architect, Market Place, Bexley Heath:—

Thomas & Edge	£2,360
W. Hart	1,650
E. Clark*	1,635

* Accepted.

BIRMINGHAM.—For the erection of 37 artisans' dwellings near Cannon Hill Park, Birmingham, for Messrs. Freeman, Thomas, & Elsmore. Mr. W. J. Ballard, architect, Willous Road, Birmingham:—

Hughes & Son	£9,050 0	C. R. Webb	£8,283
R. Rutty	8,510 0	W. C. Channing	7,972
Cragg & Co.	8,454 10	H. S. Bevins*	7,585

For manholes and main drain for the above.

A. Cooper	£225 0	G. Trentham	£137 7 0
J. White, Jun.	200 0	S. Woods*	131 2 3
Channing & Co.	198 10		

* Accepted.

BOURNEMOUTH.—For constructing a bridge over the Middle Chine, West Cliff, for the Corporation. Mr. F. W. Lacey, M.I.C.E., borough engineer and surveyor:—

A.—Stone and brick.

B. Cooke & Co., Westminster	£3,700 0 0
Jenkins & Sons, Bournemouth	3,983 0 0

B.—Specified materials.

Stuart's Granolithic Stone Company, Ltd., Limehouse, E.	£3,567 11 6
Goddard, Massey & Warner, Ltd., Nottingham	3,205 0 0
T. O. Dixon, Southampton	3,000 0 0
J. C. Lang, Liskeard	2,950 0 0
E. H. Page, Cardiff	2,850 0 0
E. H. Page	2,696 0 0
A. Handyside & Co., Ltd.,* Derby	2,420 0 0
J. O. Brettell, Worcester	1,945 0 0

*Accepted for a steel bridge.

BRIGHTON.—For the erection of a public elementary school in St. Luke's Terrace, for the Brighton and Preston School Board (U.D.):—

School Building.

W. Johnson & Co., Ltd., Wandsworth Common	£22,215 0 0
J. Longley & Co., Crawley	21,590 0 0
Holliday & Greenwood, Loughborough Park Works, S.W.	20,713 0 0
W. A. Field & Co., 20 Preston Street	20,452 0 0
W. Taylor, 44 Mighell Street	20,154 18 0
C. Jackson, 57 King Street	19,936 0 0
J. Parsons & Sons, 118 Church Road, Hove	19,363 6 10
Rowland Bros., 43 East Street, Horsham	19,196 0 0
Martin, Wells & Co., Vauxhall, S.E.	18,519 0 0
R. Cook & Sons,* Crawley	18,700 0 0

Playground, boundary walls, offices, &c.

W. Johnson & Co., Ltd.	£8,167 0 0
J. Longley & Co.	7,770 0 0
W. Taylor	7,748 0 0
C. Jackson	7,634 0 0
Holliday & Greenwood	7,453 0 0
J. Parsons & Sons	7,413 14 2
W. A. Field & Co.	7,149 0 0
Martin, Wells & Co.	6,989 0 0
Rowland Bros.	6,778 4 4
R. Cook & Sons*	6,230 0 0

* Accepted.

Laundry and Bath.

W. Johnson & Co.. Ltd.	£4,974 0 0
W. A. Field & Co.	4,838 0 0
C. Jackson	4,808 0 0
Holliday & Greenwood	4,774 0 0
J. Parsons & Sons	4,591 2 5
J. Longley & Co.	4,550 0 0
Rowland Bros.	4,532 15 8
W. Taylor	4,454 0 0
Martin, Wells & Co.	4,342 0 0
R. Cook & Sons*	4,314 0 0

Caretaker's house.

W. Johnson & Co., Ltd.	1,040 0 0
J. Longley & Co.	985 0 0
W. Taylor	980 0 0
Holliday & Greenwood	948 0 0
W. A. Field & Co.	940 0 0
C. Jackson	917 0 0
J. Parsons & Sons	897 8 1
Rowland Bros.	860 0 0
R. Cook & Sons*	850 0 0
Martin, Wills & Co.	806 0 0

* Accepted.

BROADSTAIRS.—For carrying out certain alterations and additions to the council offices, Broadstairs, for the Broadstairs and St. Peter's Urban District Council. Mr. Howard Hurd, C.E., surveyor:—

Padget & Sons, Margate	£2,150
Paramor & Sons, Margate	1,890
R. Corben & Co., Maidstone	1,883
Gann & Co.,* Whitstable	1,694

COLCHESTER.—For the erection of a Freemason's hall in Abbeygate Street, for the Trustees. Mr. Chas. E. Butcher, architect, 5 Queen Street, Colchester:—

Harriss & Rowe, Shoeburyness	£2,494	E. West, Chelmsford	£2,229
T. Grimes	2,400	W. Chambers	2,189
A. E. Diss	2,300	G. Dobson & Son	2,180
R. Myall, Clacton-on-Sea	2,279	T. J. Ward	2,165
A. Diss	2,250	R. Beaumont	2,117
F. Dupont & Co.	2,247	J. McKay, Clacton-on-Sea	2,095
		H. Everett & Son	2,050

[Rest of Colchester.]
* Accepted.

CORK.—For stabling in Bishop Street, Cork, for Messrs. Beamish & Crawford, Ltd., brewers, Cork. Messrs. Houston & Houston, architects, 5 York Buildings, Adelphi, W.C. Quantities by Mr. A. E. McEwan Waghorn, surveyor, 10 Craig's Court, S.W.:—

E. & P. O'Flynn	£7,830
J. & P. Good, Ltd.	7,150
Delaney & Co.	6,694
J. Lisk	6,200
S. Hill*	6,035

* Accepted.

DAGENHAM.—For alterations to the "Chequers" Public-house, Rainham Road, Dagenham, for Mr. T. W. Glenny, The Brewery, Barking. Mr. Theodore Gregg, architect, 1A St Helen's Place, E.C.:—

G. L. Kirby	£367 0
Goodall & Son	364 0
Barrett & Power	343 0
A. Millbon & Bros.,* Stamford	279 12

* Accepted.

EWELL.—For the erection of a small summer residence at Ewell, Surrey, for Mr. Ambrose Paterson. Mr. H. G. Quartermain, architect, Merton:—

Jones & Son	£1,467	Newton & Co.	£1,205
Price & Price	1,350	J. Burges & Son	1,185
C. King & Son	1,268	Rice	1,125
Battley, Son & Holness	1,255		

GLASS HOUGHTON (near CASTLETON).—For the erection of two shops and eight houses, Glass Houghton, near Castleford, for Mr. Chas. Hattan. Messrs. Garside & Pennington, architects, Pontefract and Castleford:—

Separate trades	£1,606

GORTON (near MANCHESTER).—Accepted for the erection of first portion of Church of St. George, Abbey Hey, Gorton, including chancel, vestries, chapel, &c., and two bays of nave. Messrs. C. K. & T. C. Mayor, architects, 41 John Dalton Street, Manchester:—

Messrs. Burgess & Galt, of Ardwick	£3,750

HAYWARDS HEATH (SUSSEX).—For the erection of new offices and buildings in Boltro Road, Haywards Heath, for the Cuckfield Rural District Council. Mr. Arthur R. Pannett, architect, Haywards Heath:—

Pickard, Turner's Hill, Sussex	£7,356 0
W. Wallis, Ramsden Road, Balham, S.W.	5,894 0
P. Jenkins, Grosvenor Crescent, St. Leonards	5,453 0
Field & Co., Preston Street, Brighton	5,443 0
T. White, Haywards Heath	5,357 0
Anscombe & Hedgecock, Lindfield	5,319 0
J. Finch, Haywards Heath	5,259 0
S. Knight,* Cuckfield	5,204 18
Peerless, Dennis & Co., Eastbourne	5,189 0

[Architect's estimate, £5,300]
* Accepted.

HOLT (NORFOLK).—For the erection of the new Gresham's School and Headmaster's house for the Governors. Mr. Howard Chatfield Clarke, architect, 63 Bishopsgate Street Within, London, E.C.:—

Hall, Beddall & Co.	£53,443	Parnell & Son	£48,657
E. Lawrance & Sons	51,577	F. S. Halliday	48,327
Cornish & Gaymer	51,557	G. Riches,* Cromer	45,980
Colls & Sons	51,223		

* Modified and accepted.

HUDDERSFIELD.—Accepted for the erection of six dwelling houses, Sheepridge, Huddersfield, for the "Deighton Unity and Peace Lodge of Oddfellows." Mr. James H. Hall, architect:—

Masons, Wood & Hepworth	Slaters, J. Robinson & Son.
Joiners, A. Lawton & Son.	Painter, John Shaw.
Plumbers, G. Garton & Son.	Whitesmith, Alfred Mellor.
Plasterers, Bassindale & Richardson.	

LAMPETER (WALES).—For the erection of school buildings for the School Board. Mr. L. Bankes Price, architect, Lampeter:—

J. Evans	£1,780
J. & W. Jones	1,750
L. Davies,* Lampeter	1,670

LLANDILO.—Accepted for the erection of electric light station at Llandilo, for the Llandilo Urban District Council. D. Jenkins, F.R.I.B.A., architect:—

Thomas Brothers	£650

LONDON.—For alterations to the second floor of No. 109 Fleet Street, for Messrs. Thos. Cook & Son. Messrs. Smee, Mence & Houchin, architects, 12 West Smithfield, E.C.:—

Barrie Bros.	£338
T. Nixon	333
J. V. Kiddle & Son*	305

* Accepted.

LONDON.—For sanitary and drainage works at Flint Street School, Walworth, for the London School Board. Mr. T. J. Bailey, architect:—

G. Parker	£6,669 0 0
Martin, Wells & Co.	4,042 0 0
J. W. Falkner & Sons	3,209 0 0
R. P. Beattie	2,968 15 6
Ashby & Horner	2,770 0 0
Johnson & Co.	2,746 0 0
J. & C. Bowyer	2,621 0 0
J. Willmott & Sons*	2,550 0 0

* Recommended for acceptance.

LONDON.—For the repair of roads at the Northern Hospital, for the Metropolitan Asylums Board:—

Myers, Gilson, & Rose, Ltd., Tottenham Lane, Hornsey, N.	£1,985 0 7
R. Borrowdale, Chase Side, Enfield	1,289 5 10
Meston & Hale, 43 Tubbs Road, Harlesden, N.W.	1,129 2 8
T. Adams, Wood Green, N.	1,097 1 10
H. Bentham & Co., Telford Avenue, Streatham Hill, S.W.	1,072 0 0
R. Ballard, Ltd.,* Child's Hill, N.W.	985 0 0

[Surveyor's estimate, £935.]
* Accepted.

LONDON.—For enlarging the manual centre and providing a room for science teaching, &c., at Hither Green School, Lewisham, for the London School Board. Mr. T. J. Bailey, architect:—

Johnson & Co.	£3,354 0 0
Holliday & Greenwood, Ltd.	2,910 0 9
F. & H. F. Higgs	2,906 0 0
W. Johnson & Co., Ltd.	2,886 0 0
Kirk & Randall	2,878 0 0
J. Garrett & Son	2,799 0 0
J. Smith & Sons, Ltd.	2,724 0 0
J. & C. Bowyer*	2,379 0 0

*Recommended for acceptance.

LONDON, N.—For making-up Priory Avenue, for the Hornsey Urban District Council. Mr. E. J. Lovegrove, engineer and surveyor:—

E. T. Blomfield, Tottenham, N.	£1,388 19 10
W. Griffiths & Co., Ltd., Bishopsgate Street Without, E.C.	1,320 14 0
Williamson & Sons, Ltd., Finsbury Park, N.	1,313 14 11
Myers, Gilson, & Rose, Ltd, Hornsey, N.	1,232 19 9
Wallace & Inns, Hornsey Railway Station	1,212 11 6
J. A. Dunmore, Crouch End, N.	1,181 9 10
T. Adams,* Wood Green, N.	1,176 2 11

* Accepted.

LONDON.—For adapting portion of building for a day industrial school at Penton Road School, Nine Elms, for the London School Board. Mr. T. J. Bailey, architect. Second competition:—

Martin, Wells, & Co.	£3,485
General Builders, Ltd.	2,975
Maxwell Bros., Ltd.	2,785
H. Line*	2,585

*Recommended for acceptance.

LONDON, S.E.—For the erection of a new house at East Lane School, Bermondsey Wall, for the London School Board. Mr. T. J. Bailey, architect:—

H. Wall & Co.	£1,248	Rice & Son	£1,095
Maxwell Bros., Ltd.	1,192	W. Akers & Co.	1,055
Lathey Bros.	1,164	J. & C. Bowyer	1,013
F. & H. F. Higgs	1,152	T. D. Leng*	996
J. Appleby	1,133		

*Recommended for acceptance.

NAVAN (Co. MEATH).—For sanitary improvements, Navan Workhouse, Co. Meath, for Board of Guardians. Messrs. Anthony Scott & Son, A.R.I.B.A., M.S.A., architects, Drogeda:—

J. Kennedy, Merrion Row, Dublin	£898 17 6
Smith Brothers, Kells	857 15 0
Roddy & Co., Dundalk	850 0 0
F. Gogarty,* Drogheda	846 0 0

[Architect's estimate, £813 9s. 0d.]
* Accepted.

OGBOURNE, ST. ANDREW (WILTS).—Accepted for the erection of two cottages at Ogbourne, St. Andrew, Wilts. Mr. J. Wornell, junior, architect, 102 High Street, Wandsworth, S.W.:—

Parker	£350 0 0

ONGAR.—Accepted for Ongar Sewerage and Sewage Disposa Works. Mr. John Simmons, M.Inst.C.E., engineer, Bank Chambers, Doncaster:—

Thompson & Wilkinson, Upminster	£2,335 3 7

PENARTH (WALES).—For the erection of bandstand, shelters, wrought and cast iron railings and gates, and the construction of roads, footpaths, sewers, &c., in connection with proposed park and recreation grounds, for the Penarth Urban District Council. Mr. Edgar J. Evans, A.M.I.C.E., engineer and surveyor:—

Parks.

Barnes, Chaplin, & Co., St. Peter's Street, Cardiff	£2,599 12 10
F. Ashley, 28 Conway Road, Cardiff	2,386 10 6
T. Bevan, Penarth, Glamorgan	2,112 16 7
T. Rees, Ely (near Cardiff)	2,088 1 0
Mackay & Davies,* St. Mary Street, Cardiff	2,084 4 9

Recreation Ground.

Mackay & Davies	£2,233 15 7
F. Ashley	2,233 15 3
T. Bevan	2,161 11 4
Barnes, Chaplin, & Co.	2,141 0 4
T. Rees*	2,029 16 10

Cliff Walk.

Barnes, Chaplin, & Co.	£1,047 6 11
F. Ashley	1,036 0 8
T. Rees	926 3 0
T. Bevan	897 13 5
Mackay & Davies*	890 5 7

* Accepted.

PRESTON-IN-HOLDERNESS (YORKS).—For the execution of certain alterations to Preston-in-Holderness Board School, for the Preston School Board. Mr. George Thorp, architect, St. Mary's Chambers, Lowgate, Hull:—

R. Finch, Tippet Street, Hull	£1,085 2 6
Leadley & Co., Francis Street, West Hull	1,073 12 6
Jackson & Sons, Witham, Hull	1,064 11 1
Hull General Builders' Company, Ltd., Lockwood Street, Hull	1,039 0 7
C. Greenwood, 70 Leonard Street, Hull	1,026 10 0
T. Kendall, Baker Street, Hull	1,001 0 0
J. R. Woods, Cleveland Street, Hull	1,000 4 6
Evans & Co., Hull	974 3 8
J. W. Fenwick, Albert Avenue, Hull	953 0 0
Smith Bros.,* Preston	952 18 11

* Accepted.

PRIEST ROW, WELLS.—Accepted for the erection of three almshouses in Priest Row, Wells, for the trustees of Llewellyn's Charity. Mr. C. Brown, architect:—

Dell Bros.	£525 10 0

SOUTH CROYDON.—For the erection of residence in Crolsam Road, South Croydon, for Dr. A. Percy Allan. Mr. Chas. E. Jackson, M.S.A., architect, Broad Street House, E.C. Quantities by Messrs. Heelis & Wrightson:—

Maxwell Bros., Ltd.	£2,997	S. Page	£2,515
Coulsell Bros.	2,719	Cadman & Sons	2,497
J. Horrocks	2,714	E. J. Saunders	2,449
Hibbard Bros.	2,650	Norsfold & Son*	2,420
Hanscomb & Smith	2,650		

* Accepted.

WESTCLIFFE-ON-SEA (ESSEX).—For the erection of a villa residence on The Leas, Westcliffe-on-Sea, for Mr. Ernest Prater. Messrs. Greenhalgh & Brockbank, architects, Bank Chambers, Southend, and Broad Street House, London, E.C.:—

S. E. Moss, Southend	£1,560 0 0
J. Shelbourne & Co., Southend and London	1,418 0 0
A. Woodiwiss, Southend	1,414 4 8
Davis & Leaney, Southend	1,360 0 0
F. Dupont & Co., Southend and Colchester	1,295 0 0
F. & E. Davey, Southend	1,267 0 0
J. Band, Southend	1,234 0 0
W. Stubbs, Southend	1,232 0 0
W. E. Davey,* Southend	1,181 0 0

[Architects' estimate, £1,200.]
*Recommended for acceptance.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 9 0	—
Clover, best	per load	4 5 0	5 10 0
Hay, best	do.	4 15 0	5 5 0
Sainfoin mixture	do.	4 5 0	5 2 6
Straw	do.	1 8 0	1 18 0

OILS AND PAINTS.

Castor Oil, French	per cwt.	1 8 0	1 8 7
Colza Oil, English	do.	1 7 0	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 4 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do.	1 0 4½	—
Linseed Oil, barrels	do.	1 12 3	—
Petroleum, American	per gal.	0 0 5¾	0 0 5⅞
Do. Russian	do.	0 0 4¾	0 0 4⅞
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	3 0 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt	per cwt.	1 5 0	1 6 6
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	1 7 0	—

METALS.

Copper, sheet, strong	per ton	85 0 0	—
Iron, Staffs., bar	do.	6 5 0	8 10 0
Do. Galvanised Corrugated sheet	do.	11 10 0	—
Lead, pig, Spanish	do.	12 5 0	—
Do. do. English common brands	do.	12 15 0	—
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17 9 0	—
Do. pipe	do.	18 3 0	—
Nails, cut clasp, 3in. to 6in.	do.	12 0 0	13 0 0
Do. floor brads	do.	11 15 0	12 15 0

		£	s.	d.	£	s.	d.
Steel, Staffs., Girders and Angles	per ton	5	15	0	6	5	0
Do. Mild Bars	do.	6	15	0	7	5	0
Tin, Foreign	do.	131	0	0	131	10	0
Do. English ingots ..	do.	130	10	0		—	
Zinc, sheets, Silesian ..	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	16	10	0	16	12	6
TIMBER.							
Soft Woods.							
Fir, Dantzic and Memel..	per load	3	0	0	4	0	0
Pine, Quebec Yellow ..	do.	4	7	6	6	0	0

COMING EVENTS.

Thursday, July 18.

British Archæological Association.—Annual Congress begins at Newcastle-on-Tyne.

Saturday, July 20.

North of England Institute of Mining and Mechanical Engineers, Newcastle-on-Tyne.—Council meeting at 1.30 p.m.

Monday, July 22, to Saturday, July 27.

Architectural Association.—Annual Excursion

Wednesday, July 24.

Royal Institute of Public Health.—Annual Dinner at the Whitehall Rooms. Presentation of Harben Gold Medal to Professor R. Koch, of Berlin.

Thursday, July 25.

Royal Institute of Public Health.—Congress opens at Eastbourne.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
July	19	Chatham Downs, near Canterbury—Repairs, &c. ..	———	W. J. Jennings, 4 Margaret's Street, Canterbury.
,,	19	Dewsbury—Houses, &c.	Pioneers' Industrial Society, Ltd. ..	Holtom & Fox, Architects, Corporation Street, Dewsbury.
,,	19	Distington, Cumberland—House	C. Clarke	Post Office, Distington.
,,	19	Durham—Works	———	County Surveyor's Office, Shire Hall, Durham.
,,	19	Kyo, Durham—Alterations..	School Board	G. T. Wilson, 121 Durham Road, Blackhill.
,,	20	Cardiff—Sanitary Appliances, &c.	———	E. Seward, Infirmary, Cardiff.
,,	20	Glasgow—Alterations	Corporation	J. M. Gale, 45 John Street, Glasgow.
,,	20	Kilkenny—Completing Church	Rev. Dr. Brownrigg	W. H. Byrne, 22 Suffolk Street, Dublin.
,,	20	Lancaster—Reslating	Properties Committee	Borough Surveyor's Office, Lancaster.
,,	20	Crumlin—House	———	R. L. Roberts, Architect, Abercarn.
,,	20	Woolston, Hants—Police Station	———	W. J. Taylor, County Surveyor, The Castle, Winchester.
,,	20	Oakley—Schools	Brill Managers	F. Taylor, 26 Temple Street, Aylesbury.
,,	20	Cymle, Neath—Rebuilding Public-house	E. E. Bevan	J. C. Rees, Architect, Neath.
,,	21	Greenock—Sheds, &c.	Tramways Company	F. Hewer, 33 Cathcart Street, Greenock.
,,	21	Kenchester, Hereford—Widening Culvert	Rural District Council	T. Llanwarne, 6 St. John Street, Hereford.
,,	22	Caterham, Surrey—Additions to Laundry, &c... ..	Metropolitan Asylums Board	T. D. Mann, Board's Offices, Embankment, E.C.
,,	22	Blackburn—Electricity Works	Electricity Committee	A. S. Giles, Borough Electrical Engineer, Jubilee St., Blackburn.
,,	22	Sheffield—Sandhouse, Brassfoundry, &c.	Tramways Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
,,	22	Raunds, Northants—Factory	———	Adams Bros., Boot Manufacturers, Raunds.
,,	22	Prescot—New School	School Board	Woolfall & Eccles, 60 Castle Street, Liverpool.
,,	22	Ballyclare—Reconstruction of the Unitarian Church.	———	J. Ferguson, 13 Union Street, Belfast.
,,	22	Horfield—Additions to School	Bristol School Board..	W. S. Paul, James & Laurence, Eagle Insurance Bdgs., Bristol.
,,	23	Didcot—Store-house, &c.	Great Western Railway Company ..	Engineer, Reading Station.
,,	23	Manchester—Extension of Station	Lancs and Yorks Railway Company ..	Engineer's Office, Hunt's Bank, Manchester.
,,	23	Pitt Hill, Durham—Alteration	Beamish and West Pelton Club, Ltd. ..	M. N. Foster, Architect, Stanley, R.S.O.
,,	23	Plymouth—Fire and Police Station	———	J. Paton, Borough Engineer, Plymouth.
,,	23	West Ham—Sanitary Convenience	Town Council	Borough Engineer's Office, Town Hall, West Ham.
,,	23	Glasgow—Firebricks, &c.	Corporation	Mr. Foulis, Manager, Gas Office, 45 John Street, Glasgow.
,,	23	Liverpool—Goods Yard, &c.	Lancs and Yorks Railway Company ..	Engineer's Office, Hunt's Bank, Manchester.
,,	23	Broadway, near Sheffield—School and Offices	Norton School Board..	J. Norton, Architect, Alliance Chambers, George Street, Sheffield.
,,	24	London, E.—Medical Officers' Residence, &c.	Poplar Union Guardians	J. & S. F. Clarkson, 136 High Street, Poplar, E.
,,	24	London, E.C.—Shed, &c.	East Indian Railway Company	Company's Office, London, E.C.
,,	24	Montfieth, Scotland—Cemetery Extension	Parish Council	J. Maclaren & Sons, 24 Bank Street, Dundee.
,,	24	Salford—Clock	Cemetery Committee	Sharp & Foster, 28 Deansgate, Manchester.
,,	24	Kingsbury, Middlesex—Schoolroom, &c.	School Board	W. A. Scotell, Clerk, Edgware.
,,	25	St. Olave's—Certain Works to House	Guardians	Newman & Newman, 31 Tooley Street, S.E.
,,	27	Brixham—Police Station	Devon Standing Joint Committee ..	E. H. Harbottle, County Surveyor, Exeter.
,,	27	Newton Abbot—Addition to Police Station	Devon Standing Joint Committee ..	E. H. Harbottle, County Surveyor, Exeter.
,,	27	Ramsey, I.M.—Business Premises	———	J. T. Boyde, Architect, Ramsey.
,,	29	Abergavenny—Additions and Alterations	Committee of the Mon. Asylum	B. J. Francis, Architect, Abergavenny.
,,	29	Glasgow—Substruction of Central Station Extension	Caledonian Railway Company	Engineer, Buchanan Street Station, Glasgow.
,,	30	Cannock—Infirmary of Workhouse	Union Guardians	A. Veall, 84 Darlington Street, Wolverhampton.
,,	30	Bury, Lancs—Extension	Electric Lighting Company	A. W. Bradley, Borough Engineer and Surveyor, Bury.
,,	31	Beverley—Repairs	———	R. Arnott, 5 Wilbert Lane, Beverley.
Aug.	1	Chester—Asylum Board	Committee of Visitors	H. Beswick, County Architect, Newgate Street, Chester.
,,	1	Chailey, Sussex—Hospital, &c.	Rural District Council	H. Card, 10 North Street, Lewes.
,,	2	Sunderland—Sheds	Corporation	Barnes & Coates, 41 Fawcett Street, Sunderland.
,,	5	Newport, I.W.—Library, Technical Institute, &c. ..	County Council	F. Newman, County Surveyor, St. Thomas Street, Ryde.
,,	7	Ely, near Cardiff—Schools	Llandaff School Board	Edgar Down, 31 High Street, Cardiff.
Sept	16	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
		ENGINEERING:		
July	19	Buckingham—Water Supply Works	Rural District Council	G. Roberts, Engineer, Deanshanger, Stony Stratford.
,,	19	Warwick—Vegetable Steamer	Guardians of Warwick Union	C. H. Passman, 48 Bedford Street, Leamington Spa.
,,	20	Warrington—Weighbridge	Water Committee	J. L. Whittle, Town Clerk, Warrington.
,,	20	Tredegar, Mon—Pipe-laying	Bedwellty Urban District Council ..	J. H. Lewis, Council's Surveyor, Blackwood, Mon.
,,	20	Shifnal—Waterworks	Rural District Council	Clerk's Office, Shifnal.
,,	20	Kirkcaldy—Electrical Feeders, &c.	Corporation	W. L. Macindoe, Town Clerk, Kirkcaldy.
,,	22	Southall—Water Tower	South West Suburban Water Company ..	R. S. G. Moore, 17 Victoria Street, S.W.
,,	22	Blackburn—Bridge	Highway Committee	W. Stubbs, Borough Engineer, Municipal Offices, Victoria Street, Blackburn.
,,	22	Broadstairs—Retort Stack, &c.	Gas Company	F. Higginson, Secretary, Gas Office, Alexandra Road, Broadstairs.
,,	22	Caterham—Machinery, &c.	Metropolitan Asylums Board	Offices of the Board, Embankment, E.C.

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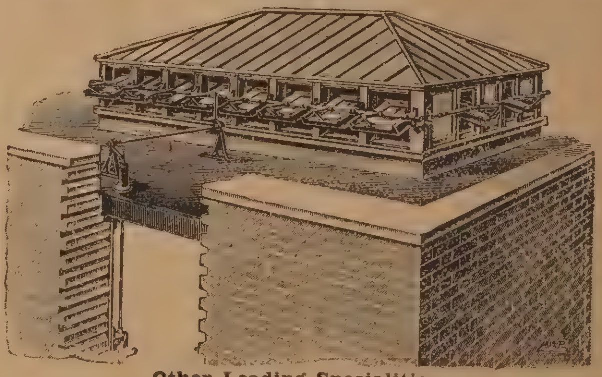

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COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ENGINEERING—*continued.*		
July	23	Southall, Middlesex—Filter Beds	Urban District Council	H. R. Felkin, Engineer and Surveyor, High Street, Southall.
"	23	Croydon—Engines and Pumps	Town Council	Borough Engineer's Office, Town Hall, Croydon.
"	23	Wellingborough—Waterworks	Urban District Council	E. Sharman, Surveyor, Market Square, Wellingborough.
"	24	Madrid—Cranes	Committee of the Port Works at Corunna	Commercial Department, Foreign Office, S.W.
"	24	Dartford—Meters, &c.	Urban District Council	J. C. Hayward, Clerk, Sessions House, Dartford.
"	24	Isleworth—Engineering Works	Guardians of Brentford Union	W. H. Ward, Paradise Street, Birmingham.
"	29	Mountain Ash, Wales—Reservoir	Urban District Council	Urban District Council, Mountain Ash, Wales.
"	29	Portsmouth—Repairing Pumps	—	A. Hellard, Town Clerk, Town Hall, Portsmouth.
"	29	Glasgow—Caisson Gate	Caledonian Railway Company	Sir J. W. Barry, 21 Delahay Street, Westminster.
"	29	Grangemouth, Scotland—Steel Swing Bridge	Caledonian Railway Company	Sir J. W. Barry, 21 Delahay Street, Westminster.
"	30	Bury—Extension of Engine and Boiler Houses ..	Electric Lighting Committee	A. W. Bradley, Borough Engineer and Surveyor, Bury.
"	31	Bradford—Electric Tramcars	Corporation	C. J. Spencer, 5 Forster Square, Bradford.
"	31	Hapton, near Padiham, Lancs—Electric Lighting ..	—	E. O'Shaughnessy, 16 Hammond Terrace, Padiham.
"	31	Heanor—Boilers, Pumps, &c., at Waterworks	Urban District Council	J. Holbrook, Surveyor, Heanor.
Aug.	1	Manila—Harbour	—	Commercial Department, Foreign Office, Manila.
"	1	Roxburgh, Scotland—Boilers, &c.	Lunacy Board	Bertrams, Ltd., St. Katharine's Works, Sciennes, Edinburgh.
"	5	Brecon—Electric Lighting..	Asylum Committee	Giles, Gough & Trollope, 28 Craven Street, Strand, W.C.
"	15	Ipswich—Reservoir	Waterworks Committee	H. Roberts, Engineer and Surveyor of Waterworks, Ipswich.
"	16	Jassy—Supply of Water to Town	Communal Council	Communal Technical Department, Jassy.
Sept.	2	Amsterdam—Electrical Tram Carriages and Rails ..	Municipality	Director of the Municipal Tramways, Nieuwe Achtergracht No 164, Amsterdam.
Dec.	10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.
		IRON AND STEEL:		
July	19	Glastonbury—Mains, &c.	Corporation Gas Department	W. A. Valon, 140 Temple Chambers, E.C.
"	20	Cardiff—Railing	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.
"	20	Tredegar, Mon—Pipes	Bedwellty Urban District Council ..	J. H. Lewis, Surveyor, Blackwood, Mon.
"	23	London, N.—Iron Fencing	Edmonton Urban District Council ..	G. Eedes Eachus, Engnr. to Council, Town Hall, Lower Edmonton.
"	31	Amsterdam—Railway Stores	Netherlands Ministry for the Colonies ..	M. Nyhoff, Bookseller, The Hague.
"	31	Sydney, N.S.W.—Rails	—	Agent-General for N.S.W., 9 Victoria Street, Westminster, S.W.
		PAINTING AND PLUMBING:		
July	20	Castleford—Painting Methodist Free Church	—	H. F. Corner, Powell Street, Castleford.
"	23	Loughborough, Leics—Painting, &c.	School Board	Barrowcliff & Allcock, Architects, Mill Street, Loughborough.
"	26	Iver, Uxbridge—Painting	School Board	W. Garner, Jun., 159 High Street, Uxbridge.
"	27	Norton-under-Cannock, Staffs—Painting, &c... ..	Urban District School Board	Teachers, Watling Street School, Norton-under-Cannock.
"	27	Osmaston-by-Derby—Painting, &c.	School Board	S. F. Antliff, Architect, Draycott.
"	30	Llansamlet, Wales—Painting, &c.	Higher School Board	R. Llewellyn, Architect, Birchgrove.
Aug.	1	Glasgow—Painting	Corporation	Office of Public Works, 64 Cochrane Street, Glasgow.
"	5	Cleckheaton—Interior Renovation of Church	—	Wesleyan Church, Whitcliffe Road, Cleckheaton.

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COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ROADS AND CARTAGE:		
July 19	Dewsbury—Making, &c.	——	C. H. Marriott, Son & Shaw, Architects, Church Street Chambers, Dewsbury.
" 19	Wigan—Paving Materials	Corporation	Borough Engineer, Rodney Street, Wigan.
" 20	Tredegar, Mon.—Materials	Bedwellty Urban District Council	J. H. Lewis, Surveyor's Office, Pengam, via Cardiff.
" 20	Lancaster—Street Works	Streets Committee	Borough Surveyor, Lancaster.
" 22	Plymouth—Redressing Setts, &c.	——	J. Paton, Borough Engineer, Plymouth.
" 22	Woodford, Essex—Granite	Urban District Council	W. Farrington, Surveyor, Woodford.
" 22	Stevenage, Herts—Granite	Urban District Council	W. O. Times, Clerk, Council Offices, Stevenage.
" 22	Dover—Street Improvements	Town Council	H. E. Stilgoe, Borough Engineer, Town Hall, Dover.
" 23	London, N.—Carts	Edmonton Urban District Council	G. E. Eachus, Engineer to Council, Town Hall, Lower Edmonton.
" 23	Warlingham, Surrey—Road Making	Croydon Town Council	Borough Engineer's Office, Town Hall, Croydon.
" 23	Southampton—Materials	Corporation	W. B. G. Bennett, Borough Engineer, Southampton.
" 23	Mountain Ash, Wales—Road Improvement	Urban District Council	J. Williams, Town Hall, Mountain Ash.
" 23	Croydon—Road Repair	Corporation	Borough Road Surveyor's Office, Town Hall, Croydon.
" 23	Crewe—Repaving	Town Council	G. Eaton-Shore, Borough Surveyor, Earle Street, Crewe.
" 23	Crewe—Street Making, &c.	Town Council	G. Eaton-Shore, Borough Surveyor, Earle Street, Crewe.
" 23	Amble—Making-up	Urban District Council	W. Gibson, Surveyor, Amble.
" 24	Castleford—Asphalting	Urban District Council	W Green, Surveyor, Council Offices, Carlton Street, Castleford.
" 24	Denton, Lancs—Setts	Urban District Council	G. H. Newton, Surveyor, Town Hall, Denton.
" 25	Nottingham—Road	Water Committee	S. Moors, Water Manager, St. Peter's Churchside, Nottingham.
" 28	Lochgelly, Scotland—Granolithic Paving	Town Council	W. Birrell, 200 High Street, Kirkcaldy.
" 30	London—Formation of Streets	London County Council	Architects' Dept., Housing of the Working Class Branch, 18 Pall Mall East, S.W.
	SANITARY:		
July 20	Bridlington—Sewers, &c.	Town Council	E. R. Matthews, Town Hall, Bridlington.
" 20	Fulwood, near Preston, Lancs—Sewerage Works	Urban District Council	W. Naylor, 16 Walton's Parade, Preston.
" 20	Stroud—Sewerage Works	Rural District Council	F. Winterbotham, Clerk, John Street, Stroud.
" 22	Alfreton—Sewers	Urban District Council	E. Houfton, Surveyor, King Street, Alfreton.
" 22	Basford, Notts—Removal of Night Soil (two contracts)	Rural District Council	C. J. Spencer, Clerk, Public Offices, Basford, Nottingham.
" 23	Llantrisant, Wales—Sewerage Works	Rural District Council	G. S. Morgan, Surveyor, School Street, Pontyclun.
" 24	Pakefield, Lowestoft—Sewerage Works	Rural District Council	F. Peskett, 148 London Road, Lowestoft.
" 24	Pulteney Town, Scotland—Sewers	Local Authorities	G. A. O. Green, Town Clerk, Pulteney Town.
" 24	Lyme Regis, Dorset—Sewers	Town Council	M. C. Preston, Town Clerk, Lyme Regis.
Aug. 1	Stroud—Sewage Disposal Works	Rural District Council	F. Winterbottom, Clerk, John Street, Stroud.
" 8	Upton-upon-Severn—Sewers, &c.	Rural District Council	E. B. Marten, Church Street Chambers, Stourbridge.
" 12	Darfield, Barnsley—Sewerage Works	Urban District Council	Council's Surveyor's Office, The Poplars, Darfield.
	TIMBER:		
July 23	Horton, Epsom—Fencing, &c.	Asylums Committee of the London C.C.	R. W. Partridge, Clerk of the Asylums Committee, Horton.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
July 20	Truro—Sewage Scheme	——	R. Dobell, Town Clerk, Truro.
" 31	Manchester—Fire Station and Police Station	£300, £200 and £100	W. H. Talbot, Town Hall, Manchester.
Aug. 1	Egremont, Cumbrld.—Alteration of Property in Main St.	——	J. Lowery, 59 Main Street, Egremont.
" 31	Sheffield—Alteration of Ecclesall Church	——	Rev. T. Houghton, Ecclesall Vicarage, Sheffield.
Oct. 1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.

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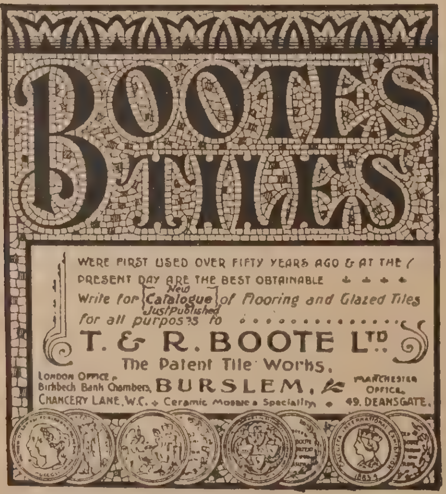

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JULY 24, 1901.
No. CCCXXXVII.

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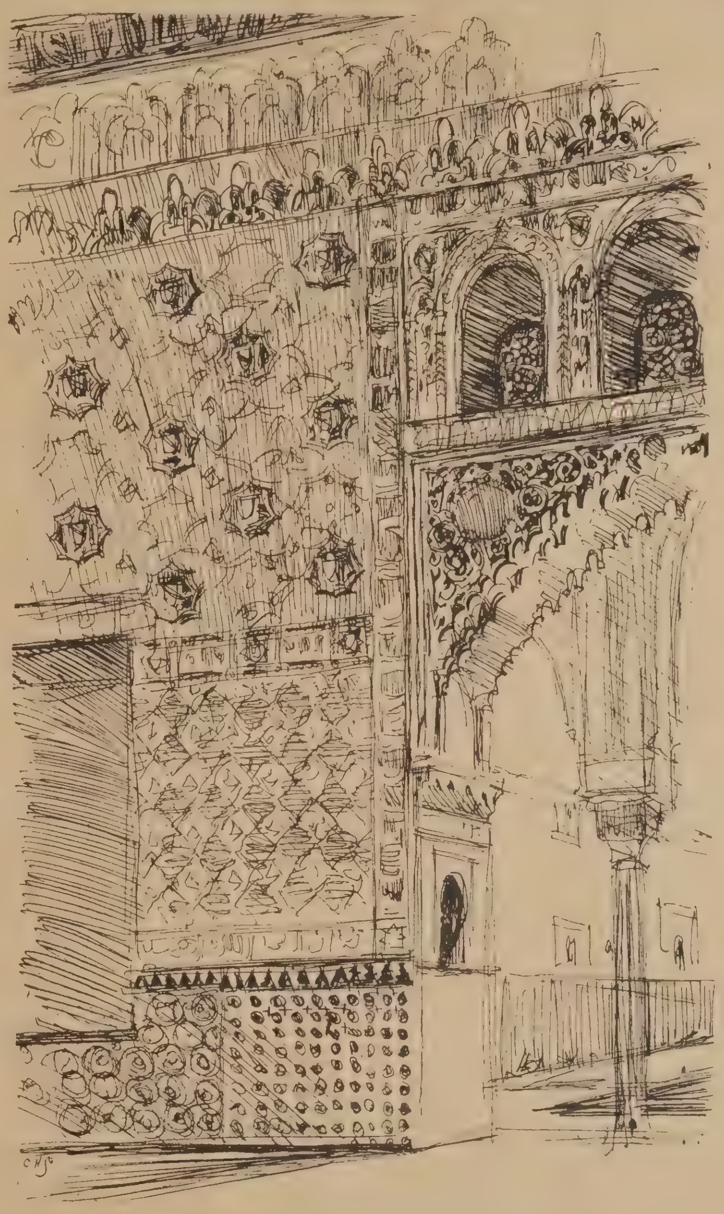
An Architectural Causerie.

Models. THE House of Lords distinguished itself last week in carrying against the Government a motion requiring the preparation and public exhibition of models of the proposed new public offices in Whitehall and Parliament Street. The House of Commons has made an unenviable reputation for ignoring all artistic questions, and the House of Lords has been our only reliance, the Earl of Wemyss commendably paying especial attention to architectural matters. His latest advocacy of models is a good one, and these ought certainly to have been prepared with such important works as the new Government offices. Professor Aitchison's letter, published on p. 366 of our issue for June 12th and referred to by Lord Wemyss, had, as the Earl of Pembroke pointed out, especial reference to the appointment of two architects, but that was not all—his reference to the preparing of models was most important, for by no drawings can the general design and layout be shown in the full conception of the architect as to the completed aspect. Of course during the erection of the building multitudinous points arise which must be decided, and often altered from the original design, by one who is aware of or can fully perceive the intention of the architect and what is the only proper course, and in this respect a second architect should certainly be appointed. But in any case there should be a model or models prepared, and although late in the day models of the proposed offices will be most useful. We have on previous occasions referred to the great advantages that may be obtained by making rough models in designing any building; they can of course only be suggestive even when the surroundings are also modelled and lighted carefully, and must always be judged with due attention to scale.

Artists' Mediums. AS a pen draughtsman—and particularly as a facial draughtsman—the well-known American artist, Mr. Charles Dana Gibson, occupies one of the highest positions, and it is therefore instructive to hear what he has to say on the relative values of drawing mediums. He prefers pen and ink to any other medium, because it tests to the utmost the draughtsman's powers. All other methods, he declares, are demoralising, since they enable the artist to slur over difficulties of drawing. With "line" one must study hard and think out a subject before starting on it, for if this be not done the finished picture will be full of faults that cannot be hidden. When he grows old, Mr. Gibson says, he will resort to wash, charcoal, &c., for his own amusement. Painting, too, is one of the pleasures he is reserving for the days when his hand will be less facile and his brain less active. This is rather derogatory to all other mediums than pen and ink, and it will doubtless be denied in some quarters; still the fact remains that pen draughtsmanship is exceedingly difficult, and there are few who really excel in it—only men like Abbey, Pennell, Crane, Parsons, Fortuny, Vierge, Menzel. The advance of the art in recent years has been marvellous, so much so that it has been styled by some as the only really living art. Its exponents have forced its being recognised as seriously as painting or any other art work, and from serving as a plaything for the old masters it is grown to be a potent factor in modern illustration. Pen work, however, has its limitations, and by reason of the fact that it is now possible to reproduce tone and colour work with ease and rapidity artists and illustrators are more extensively employing these mediums. Only those who have had experience know how difficult it is to represent tone in pure line, yet that it is possible to do so with the greatest success one needs only to study some of Mr. E. A. Abbey's beautiful work (some excellent specimens are now to be seen at South Kensington). Though the numerous publications of this and a previous day have been the nursery and home of modern illustration the hurry appurtenant to them has caused the quality of the work to depreciate in some respects, being less careful and less finished than that of the older men such as Millais and Boyd Houghton, and this danger needs to be continually guarded against by the artist. Writing on this subject we would take the opportunity to offer a few hints to those who make architectural drawings for reproduction. Wash work may be dismissed briefly with the remark that it should be in good contrast and solid in appearance. Line work needs considerable more surveillance. For the uninitiated it may be mentioned that the original must be *altogether* in line; shadow must not be produced by washing over, but by thickening the lines or multiplying them. We often receive drawings of houses in pen and ink with the walls washed over here and there, or the roof tinted, or the background covered with a tone. Such drawings are unsuitable for making line blocks. Much has been said and written on this subject, and it is not our intention to go over ground which is already familiar. We, would, however like to warn students against the fastidious nonsense which has prompted some to say that it is essential to draw on this paper with this ink and this pen. Any fairly smooth paper is satisfactory; any ink which is reasonably black; and any pen which marks well. So long as the draughtsman remembers that every line reproduces of the same value (gradation being effected by varying thickness and not by fainter ink), that lines close together somewhat in the course of reproduction, that fine cross-hatching for this reason is to be avoided, and that thin isolated lines tend to become broken in printing, he will not go far wrong. Recollecting these things, he can work with a free hand.



ENTRANCE TO THE HALL OF THE AMBASSADORS, ALHAMBRA, SPAIN.
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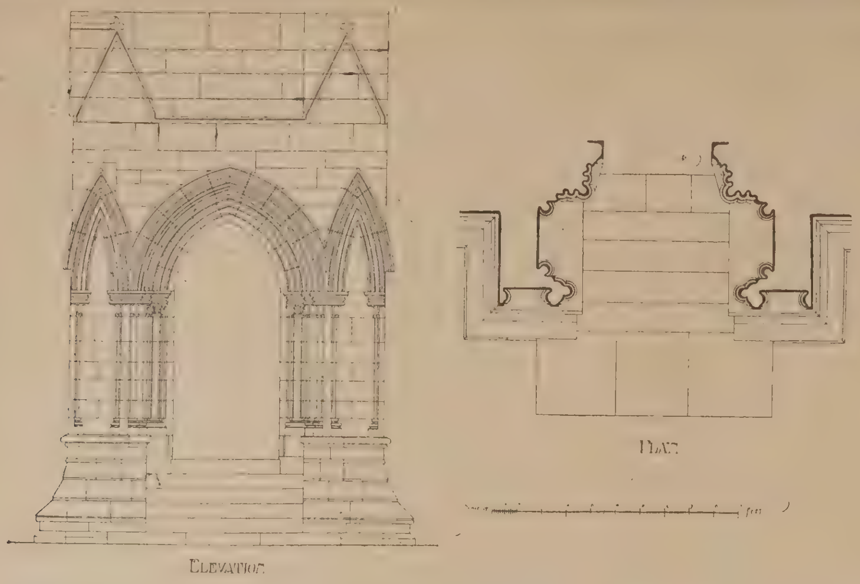


SOUTH PORCH TO LOWER CHURCH, GLASGOW CATHEDRAL. MEASURED AND DRAWN BY R. M. McKISSOCK.

IMPRESSIONS OF GLASGOW CATHEDRAL.

By J. JEFFREY WADDELL.

(Concluded from p. 456 of No. CCCXXXVI.)

ONE of the most beautiful pieces of work in the cathedral is the rood screen. It greatly resembles that of the collegiate church of Lincluden; but while in the Glasgow example the sculptured cornice is as rich, it has also the additional beauty of a fine traceried parapet with beautifully designed tabernacle work supported by sculptured corbels representing the seven ages of man, and by two ecclesiastics—probably portraits—at the ends. The line of the arch is much finer than that of the Lincluden screen—it more nearly resembles the fourteenth century doorway at St. Bride's, Bothwell—and by omitting the capitals and so carrying the rich mouldings uninterruptedly from base to base, the architect, who according to Mr. P. Macgregor Chalmers was John Morvo, has accentuated this beautiful line. But while the screen is still very fine, it has suffered greatly from the loss of its eight statues and carved corbels which adorned the panels on each side of the doorway. The addition of these would balance the heavy rich parapet, add interest to the design and complete it as an architectural composition. As it is, with its two altars—the only two now remaining in the cathedral—and its flight of steps for a base, it appears, viewed from the lower level of the nave, one of the most complete and satisfactory pieces of mediæval design in Scotland. Unfortunately the view from the choir is altogether spoiled by the modern woodwork the details of which, while they are appropriate enough when executed in stone on the other side, are distinctly out of place in wood.

The two altars which remain one on either side of the entrance to the central aisle of the choir are very interesting. They are chiefly so because of the panelling with sculptured figures—supposed to be the apostles—bearing scrolls which adorn the fronts, and because on the south end of the altar, called The Altar of the Blessed Mary of Pity, Archbishop Blacader's arms are to be seen. It will be observed that the cross has been carefully removed by the Reformers and that no wanton damage has otherwise been done to the sculptured work. On the north side of the other altar the only cross in the cathedral remains, having probably been overlooked.

The shallowness of the transepts is said by some to be a French feature; but it appears to me that common sense as much as anything else caused the designers to be content with the present shallow but useful form. To have extended them further would not have added to their usefulness, but would have greatly added to the cost of the building, which was at the time the transepts were built a very weighty consideration indeed.

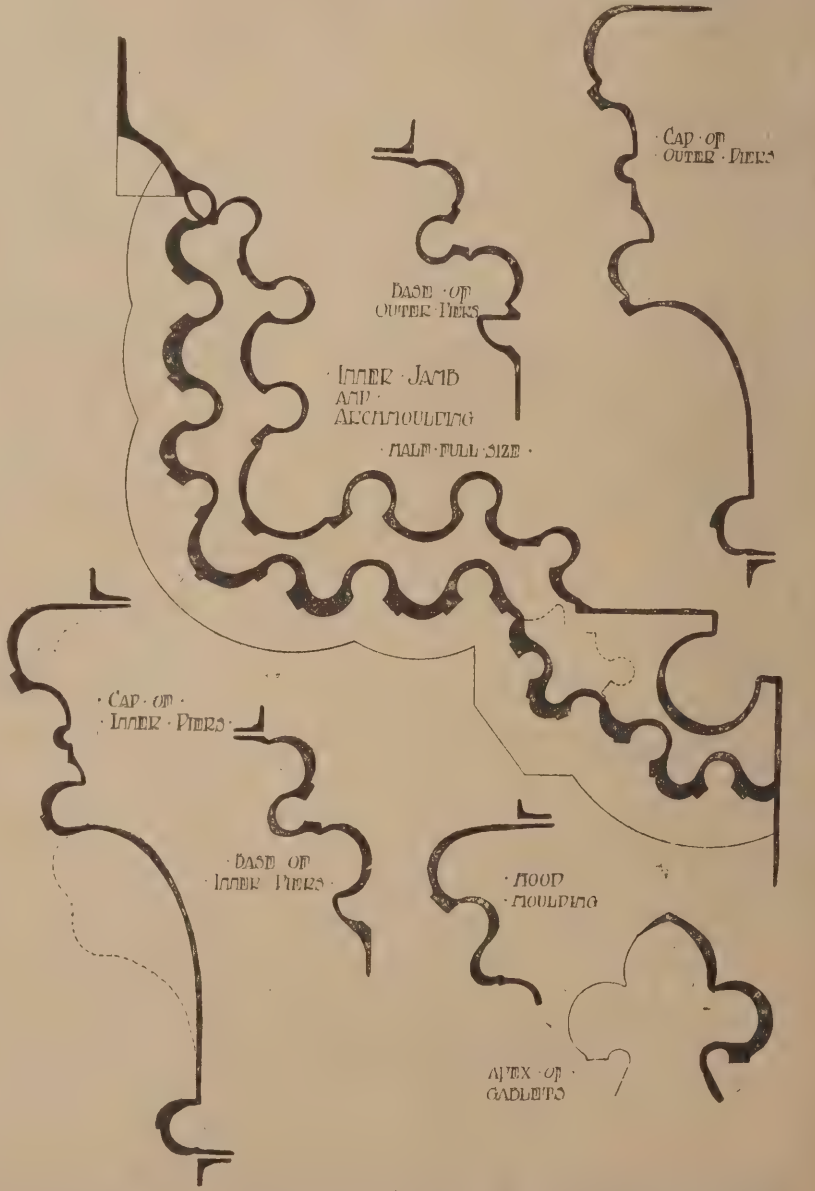
In strange contrast to the plainness of the nave is the rich foliage and sculpture of the choir. The capitals are very fine, but unfortunately have been very much restored. On entering the choir the first thing that strikes one is the peculiar character of the east end. The triforium is not as usual carried round the end, but is stopped, and instead the four lights—not the usual three or five—are brought down to the level of the triforium string course. This has, viewed from the interior, a very good effect, but from without the effect, as already stated, is not good. The square east end appears to be resting upon the roof of the double aisles. The gable is carried by three pillars. The centre one is rather curious, the small shafts which would obstruct the view of the eastern aisles being terminated not far below the capitals by carved corbels. In the spandrel immediately above this pillar there are three niches which formerly contained statues.

The triforium arcade is of the usual character, but is interesting for the way in which the harsh line formed by the cutting of the bell of the capital is covered and converted into quite a thing of beauty by the addition of a small leaf.

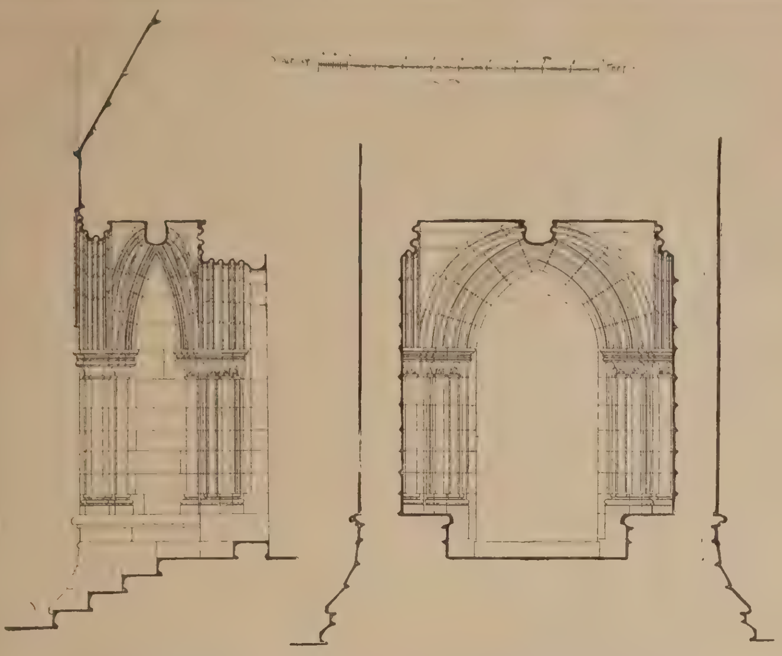
The eastern aisle and chapels are remarkably rich in their ornamentation and elegant in design. Here the "dog-tooth" is employed most effectively round the inside of the arch in the north chapel. There is also a piscina here, evidently to supply the adjoining altars. The peculiarity about it is that it does not reach the ground as a drain but appears as a gargoyle on the outside.

At the other end of the aisle is the doorway to the sacristy, a square vaulted compartment with a central pillar. This pillar is curiously carved in the hollow of the base, and it has been intended to further carve the vertical hollows of the shaft, but they are still unfinished.

One of the most interesting portions of the cathedral is that variously known as the aisle of Car-Fergus, Blacader's Crypt and the Dripping Aisle. The first is undoubtedly most correct;



SOUTH PORCH TO LOWER CHURCH, GLASGOW CATHEDRAL. MEASURED AND DRAWN BY R. M. McKISSOCK.



CROSS SECTION. LONGITUDINAL SECTION.
SOUTH PORCH TO LOWER CHURCH, GLASGOW CATHEDRAL. MEASURED AND DRAWN BY R. M. MCKISSOCK.

for have we not in the vaulting of the roof a rudely-sculptured car bearing a figure and surrounded with a scroll on which are inscribed the words THIS · IS · YE · ILE · OF · CAR · FERGUS? It is called Blacader's Aisle after its restorer. But the fact that this aisle bears so many names appears to indicate that there is some doubt in the public mind about its builder and use.

Although almost ruined by misuse and neglect, the vaulted roof is one of the finest examples of this date remaining. The mouldings, carved bosses and capitals are very rich and varied. On the capital of the middle pier of the south wall the letter M occurs under the royal crown. This is no doubt meant to typify that union of which William Dunbar, the friend of Archbishop Blacader, sung so sweetly in the *Thrissil and the Rose*—that union of which so many happy things were expected but which ended so disastrously for Scotland on the field of Flodden.

As has already been said, the chief beauty of Glasgow Cathedral is its under-church; but unfortunately it cannot be at all well seen. The lighting is at present so bad that we are forced to conclude that the windows were not originally meant to contain coloured glass such as at present obscures the design and beauties of the building. They render the church so dark that one naturally turns to the windows as the only thing to be seen, and apart altogether from the magnificent carving and sculpture which is thus hidden from view the greater part of the glass is unworthy to occupy its present position and should certainly be removed if not destroyed. The best authorities inform us that the present windows if filled with uncoloured glass would amply illuminate even the darkest corners, and a simple proof of this is seen in that most of the light at present received comes not from the windows but from the doors.

The plan of the under-church is very interesting. It has been arranged round the tomb of S. Kentigern and the high altar. The piers at first sight seem to be very irregularly disposed, but if the plan be drawn out they arrange themselves symmetrically round the two chief centres. To further emphasise these points the vaulting is in each case more elaborate. This is especially the case in the portion under the high altar. It is profusely rich in ribs and sculptured bosses; and advantage has been taken by the architect to increase the height of the crown as it is under the raised steps of the high altar of the cathedral.

Traces of brilliant colour are still to be seen in the hollows of the ribs, and interesting lettering has also been discovered painted on the vaulting.

Immediately east of the high altar the church floor falls about 4ft. 6in., and the east end is divided into four chapels by side walls used as credence tables and piscinæ. The floor has not originally been intended to be so low as it is at present; for as they are now the credence tables and piscinæ are too high for use. This also explains the meaning of the at present useless steps at the door of the chapter-house.

The chapter-house is entered from one of the four altar-chapels, so that the particular saint to whom that altar was dedicated—S. Nicholas —cannot have been much esteemed in ancient Glasgow. The centre of the three divisions between the altars has had its central pillar removed and one arch formed beneath which rests the effigy of Bishop Robert Wishart, who was buried here in 1317. The effigy has, however, been made too large for its position, and the feet have accordingly been cut away. The face is also greatly damaged.

The door of the chapter-house is one of the finest pieces of work in the cathedral. It is exceedingly ornate, being enriched not only with carved capitals but with a band of sculpture and foliage extending round the arch.

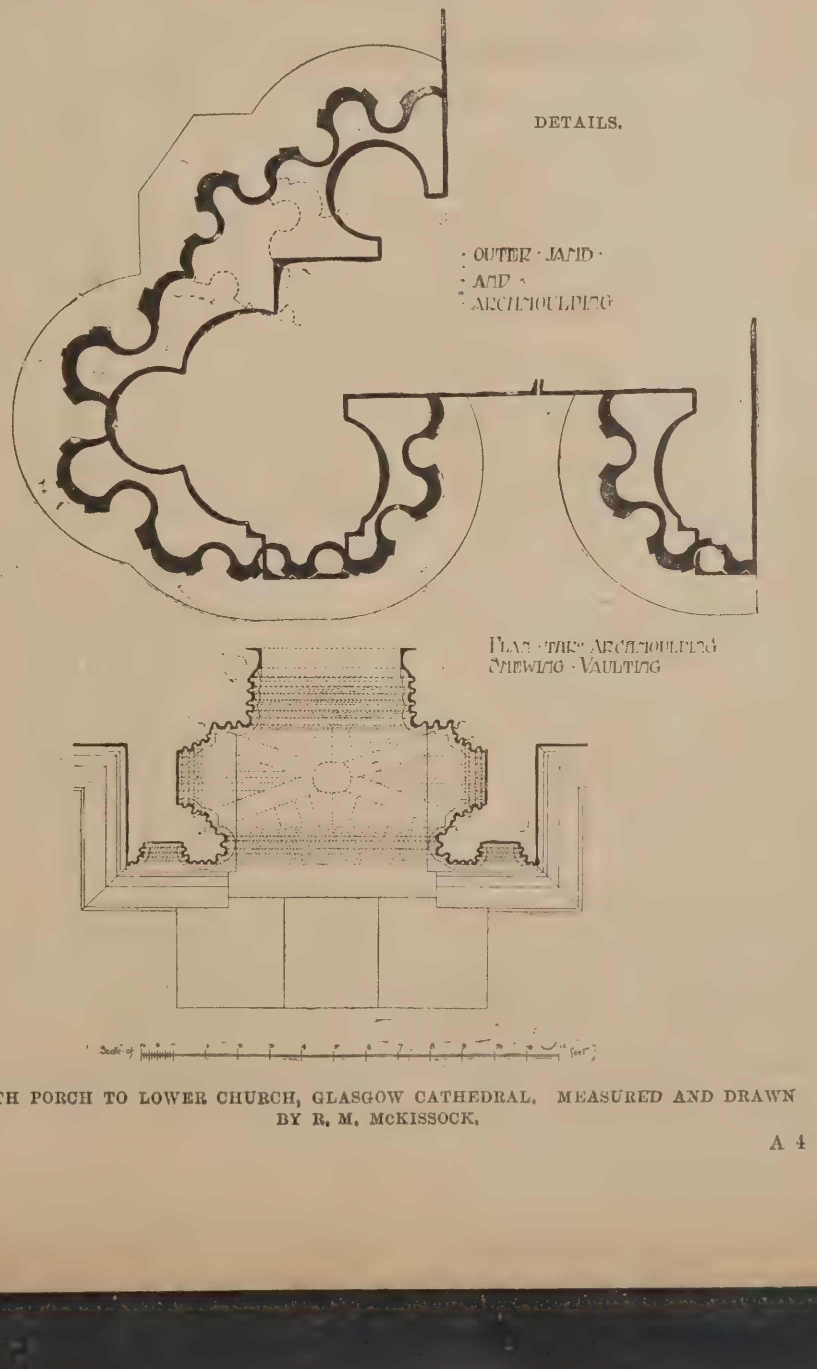
These little sculptures are interpreted by Mr. Chalmers as illustrating the heights to which man can rise and the depths to which he may fall.

At the foot of the south steps leading to the nave there still remains, built into the present building, a fragment of the older Transitional Church. One single column is about all that now remains to guide the architect and the antiquary in their search after truth, but on that evidence a great number of theories have been raised; but let it suffice to say that it is now admitted to be the corner of a smaller church which probably terminated in a semicircular apse round S. Mungo's tomb.

Much has been done since the restoration of the cathedral to decipher the history of its various periods, but much remains still to be done and many interesting discoveries will no doubt be made in days that are yet to come.

(We are indebted to Mr. A. G. Henderson for the photographs illustrating this article.)

Infectious Diseases Hospital at Colwyn Bay.—A Local Government Board enquiry was held recently at Colwyn Bay into an application by the Urban District Council for leave to borrow £5,120 for the purposes of an infectious diseases hospital.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SOUTH PORCH TO LOWER CHURCH, GLASGOW CATHEDRAL. MEASURED AND DRAWN BY R. M. MCKISSOCK.

ON ARTS AND CRAFTS IN IRELAND.

BY AN IRISH PRIEST.

AT the recent meeting of the Maynooth College Union the following address was given by the Rev. J. O'Donovan, of Loughrea :—

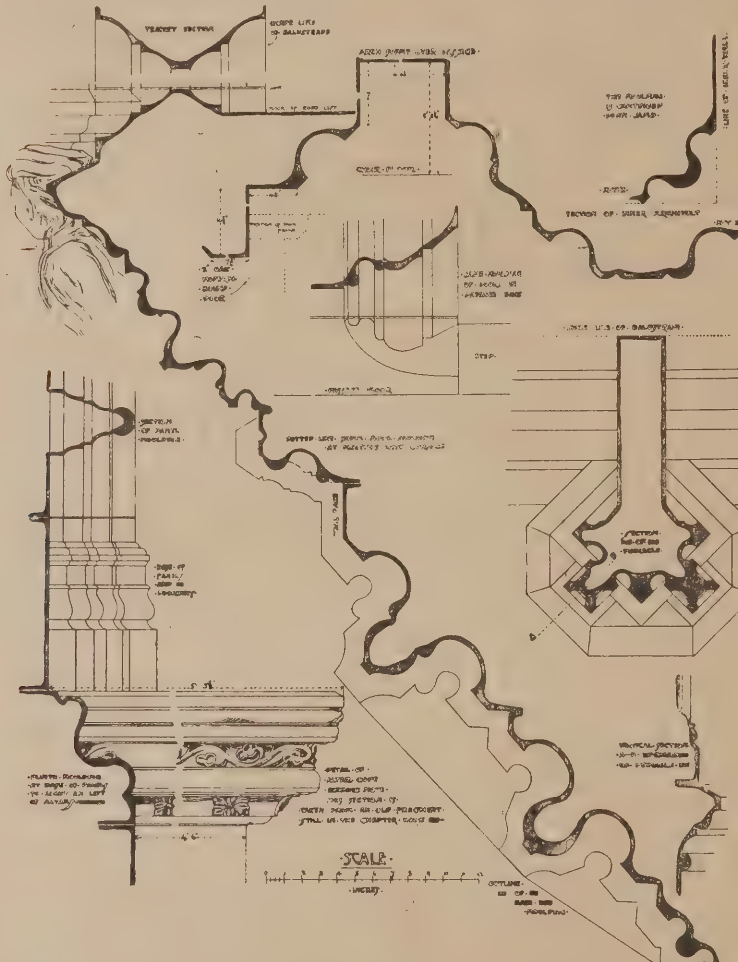
The assertion that a revival of industries is necessary for the prosperity of Ireland, and even for its national existence, has in recent years become somewhat of a commonplace. We have all come to realise that the agricultural industry alone, although it is and will be for many years the staple industry of Ireland, cannot, however, satisfy all our economic needs. When we shall have gained a stable tenure of land and an equitable distribution of it there will still remain the problem of the disposal of a surplus population. The choice will lie between emigration—with its wreck of national life and national wealth—or an industrial revival on a large scale. Nor is this question affecting the future only. Who among us, who has a heart to feel, has not been stirred to the depths by the thought of that quarter of a million of the strength and intellect of Ireland that within ten years have left Ireland, sorrowing, because there was no work at home for their hands to do? Consumers are largely to blame. We are a poor lot here in Ireland in many respects, if we only have the grace to admit it. We abuse England and things English roundly with our tongues, but we have a hankering for English goods and English taste and the stamp of English approval. When we speak of encouraging Irish manufacture we mean, therefore, more than the mere immediate use of Irish things ; we mean, by the strength of our demand, to force idle Irish capital to become a national wealth producer. Now, where does the priest come in? Pretty well everywhere. He is still the valued friend and adviser of the people. He ought to lose no opportunity of impressing on the people the economic aspect of the emigration question. He ought to bring his own influence and the influence of his parishioners to bear on capitalists to invest their money in Irish enterprises. He ought—but here I speak with the diffidence of absolute ignorance—if he is a capitalist in a small way himself to give an example to his followers. And now I come to what is the main object of this paper, and to which what I have hitherto said may serve as an introduction.

SOUTH PORCH TO LOWER CHURCH, GLASGOW CATHEDRAL.
PHOTOGRAPH BY A. G. HENDERSON.

One of the largest consumers of goods in Ireland is the Catholic Church. Hundreds of thousands of pounds are spent annually on churches and church-decoration. Within the memory of most of you millions have been spent for the purposes of the Church. To those interested in Ireland the question has naturally often arisen, Has all this money been spent as far as possible in Ireland, and if not, is there any possibility of securing that all church work should be done in Ireland in future? Before answering these questions I shall have to offer some explanation of my method of treating them. The advocacy of Irish manufacture in church work differs from other branches of the subject in this—that it deals necessarily with questions of art, and where art is concerned we must deal with the question from the art point of view as well as from the commercial and industrial. What I mean is this—if we find that decoration of Irish churches is as a rule not done in Ireland, before we advocate a change the burthen will be laid on us of showing that the work can be done not only industrially as well in Ireland as abroad, but also that it can be done as well, or better, artistically. Taking the shell of churches, they are generally built of Irish stone, roofed with Welsh slate, without in very many instances any effort whatever being made to secure Irish slate. I am not concerned in this paper, which must have a limit somewhere, with the style of our churches, though, in passing, I may remark that it is generally execrable. Architecture in Ireland seems to have fallen from the place it held in mediæval times as the mistress of all the arts. All over the country Gothic churches, false in detail and bad from every artistic point of view, have sprung up during the last fifty years. They are a monument to the zeal and piety of the people, but they are also a monument to the want of taste of modern architects. Beyond the mere walls of our churches and the unskilled labour employed throughout, it must be admitted that 80 or 90 per cent. of the remainder of church work—woodwork, carving in stone and wood, stained glass, painting, &c.—is all foreign work. When we consider that the churches of Ireland are built to the glory of God by the hard-earned money of the poor there must be very strong reasons indeed to justify anyone engaged in church-building in spending the money of an impoverished people for the enrichment of foreign nations to the detriment of art and trade in Ireland. Tradesmen have complained, not once but often, that church money has been spent in England and elsewhere that, if spent in Ireland, would have kept alive trades now languishing from dearth of work. Now, there is to my mind no reason why any church work falling under the head of the ordinary trades should not be done at home. We have Irish carpenters and Irish smiths just as good as in any other country. The great field of argument, however, centres around church art work. It is in this field that the foreigner reigns supreme in Ireland. It is at decorative work that many strong supporters of Irish manufacturers draw the line and say "Here we must stop." Ireland can produce no art ; we must, at least for generations to come, stick to the foreigner. We must go on getting our statues from Florence and Geneva and Munich, our stained glass from Munich, from London and Birmingham, our woodwork from Belgium, our paintings anywhere expect in Ireland. "You know those foreigners are all artists," say the admirers of foreign art in this country ; "the Dublin men can't touch them." Now, I have no hesitation in saying this is all ignorant twaddle. We want a little plain speaking here in Ireland. Every year this unfortunate country, which everything seems to conspire against, is being flooded with bad sculpture and bad painting, and worse stained glass, all, forsooth, because it is foreign and therefore must be good! Of course, there are many in this audience who will deny this. Many will say "This is very true of much of the church-decoration in Ireland, but it is not true of my church. My windows are very beautiful and have been much admired." In order to meet these objectors it is, therefore, better to examine somewhat in detail the different classes of church-decoration. Stained glass is one of the most familiar forms of decoration in our churches. There is scarcely a church in Ireland that has not one or more stained glass windows. In some of the large churches the cost of those windows runs up £3,000 or £4,000. It may seem a rather sweeping statement to make, but it is a statement upheld by every expert authority on art that generally—indeed, in almost all cases—this glass is, from an art standpoint, beneath contempt. It is as a rule gaudy in colour, badly drawn, vulgar in design, and where perspective is attempted, false in perspective. It is, moreover, bad glass. There are many varieties of glass known by the very indefinite name of stained glass. There is pot-metal, which alone was used in the best period of stained glass. In this glass the colour runs through and through the texture of the glass, the colour and the glass being fused together in the pot. Then there is enamelled glass, in which the colour is enamelled on the glass in soft pigment. When stained glass manufacturers advertise they always profess to supply a window, as the advertisement puts it, "best pot-metal antique." When the window is put up it is not infrequently very poor enamelled stuff. A trained eye sees the difference at a glance ; an untrained eye sees the difference after the glass has been put up twenty or thirty years, or very much less in many cases. The real pot-metal is only mellowed by time ; its colours grow richer and more jewel-like. But years deal hardly with enamelled glass, especially with the modern stuff. The enamelling begins to wear off ; faces become patchy, clothes tattered ; it becomes pitted all over in the blacks and browns ; finally, the unfortunate owners would be glad if some thief came in the night and removed the eyesore. Even in churches where a fairly good quality of glass is used the result is equally disastrous. There is a craze for pictured windows, large and elaborate subjects that tell stories. This is a complete misunderstanding of the limitations of stained glass. In the thirteenth century, when the finest glass was produced, there were no elaborate pictures ; the effects were produced by careful leading and a most delicate choice of differently coloured glass. If figures were necessary they were outlined in leads, the feature and other details being worked in with the smallest possible use of brown pigment. The artist craftsmen of these times knew exactly what could be done in glass and what could not. They knew that the first quality of a window is to give light, and next, if it is to be coloured, its function is to give coloured light of the finest kind. For that reason the thirteenth-century artists always aimed at colour and translucency. Now the modern windows sin in almost every instance against this primary law. The function of the modern window seems to be to shut out light, or where it is let in to pass it through thick dirty brown or other paint with which the glass is thickly plastered. To understand fully what I want to convey it is necessary to have seen some good glass of the best period and compare it with the modern. The best examples are to be seen at Chartres Cathedral outside Paris. There are also a few fine examples which somehow escaped the vandalism of Puritanism in some of the English cathedrals—in York Minster, in the east window, in Salisbury, Lincoln, Westminster and others. These windows, when the sunlight passes through them, are like mosaics of different coloured jewels, they never look gaudy because of the extreme purity of their tones. Sunlight through a modern window is robbed of all its beauty, and strikes the eye as a dirty drab. Apart from quality and colour, the modern stained glass window is bad and vulgar in design. I shall not speak now of incorrect drawing, which is to be found in many of the stained glass windows in Ireland. The human figures are certainly not of any race that inhabits this earth in any known period of history. But even given correct drawing, the effects of light and shade are always wrong ; they are impossible with light always falling on the picture from behind. Attempts are made at presenting religious pictures to incite our devotion. The effect is usually a number of conventional dummies, with embroidered clothes and an expression drawn from milliners' showcards. This may sound irreverent. It sounds so to me; but desperate diseases require desperate remedies. I feel intensely having the highest ideals of our religion, the saints that we revere, the Man-God that we love and worship, vulgarised by the ignorance and incompetency of the modern stained glass maker. Another important branch of church-decoration is sculpture. There used to be a fine art known as sculpture. To judge by the Irish churches it is a lost art. Here again the foreigner holds the field. Go into our churches and you will find that the more pretentious of the statues come from Italy and Munich. If you venture to say you don't like the work the good priests looks you all over with a smile of superior pity, and reduces you to your proper level by the clinching remark, "Why, this statue was made at Carrara." Of course there are marble quarries at Carrara and stone-cutters of very great technical skill, but art, with an idea behind it, especially on religious art—no! Take a statue of St. Joseph, admitting that it is modelled correctly, which it very often is not, does it convey any religious idea to the mind? Only for the label it might just as well have stood for Marcus Aurelius or any other character that you like to think of. Church-painting is at just as low an ebb. All our church-painting, with such few exceptions as are hardly worth noticing, comes from abroad. Rome, Germany, Belgium, France, are the principal markets. We may dismiss this branch of church art in a few words. The paintings are either attempts at religious art not above the level of daubs, or fairly good pictures—not religion. What I mean by the latter is this—for some time past the country has been flooded by good and bad copies, generally made in Germany, of paintings entitled Madonnas, Magdalens, &c. The originals were painted by men who had no religious belief and are frankly naturalistic in treatment. Yet those pictures, often the grossest portrayal of human passion, are hung up in convents and other religious buildings, even in churches, to inspire the reverence and devotion of the faithful. There are other branches of church decoration—brass, gold, and silver work and woodwork, that I shall only allude to. They are generally made in Birmingham or in Belgium. Now, how do we stand? We have first an immense consumption of decorative work that show no sign of decreasing. We have most of this produced abroad, and done almost as badly—considered artistically—as one could possibly conceive. This work, if it could be done in Ireland, would be an immense industrial gain, and would provide work for thousands of hands. But it has behind it far higher possibilities. It may make Ireland a great centre of art production. Ireland once was, as you all know, remarkable for its art products. "The barbarians by the Western Sea," as a Greek writer called our fathers, knew the exquisite art of enamelling on various metals when it was unknown to the Greeks and Romans. The country that produced the Tara brooch and the cross of Cong and the Ardagh chalice had surely a highly developed art sense. In architecture our fathers did work of wonderful beauty. The Romanesque ornament at Cong, at Dysart O'Dea, the whole design of that imperishable memorial to Irish genius on the Rock of Cashel—Cormac's chapel—indicate what Irish art might have come to had it not been arrested by foreign influence. The revival, if there is to be a revival, will rest with the Church. The Catholic Church has at all times been the centre of art production. Shall it be so in Ireland? We have hitherto allied ourselves with the Philistines in art, and have followed the lead of incompetent architects and pushful commercial travellers from Birmingham and Munich, who make periodic calls on the patronage of the reverend clergy. Shall we make a new start? We are little to blame for the past. Our Church was forced to live for centuries without any of the helps of art. When the penal laws were dropped, before an art sense had time to develop, the priests of Ireland placed their confidence in men who were supposed to know, but who, as the result has proved, are but ignorant, and, I shall add, impudent pretenders. Personally I am confident that if the priests are willing, they can be in their own special field of work—the Church—the great agents of the industrial and art revival. The future of it is largely in their hands. I shall go further and say that if they can do it they ought to do it. It is not a matter of choice, it is a matter of obligation. It is not a matter of opinion, it is a religious and national duty. This country is seething over with a new life. There is a revival in thought, in self-respect, in real nationality. People are slowly realising that the Irish people ought to be Irish, that there is such a thing as a distinctive national individuality expressing itself in language, in literature and in art. We, fathers, hold the art of the country at our call. Shall we go on as we have done in the past—I say it without fear of contradiction from any competent art critic in Europe—filling our churches with foreign rubbish; or shall we make an attempt to make our churches the expression of the Irish ideal in art; shall we try to make our churches worthy of the faith and piety of the Irish people, worthy of our own devotion to sacred and national aspirations, worthy of the religion we love, of which real art alone should be the handmaiden? Some of my listeners who may not wish to scalp me for any other reason will probably say: "All very fine, but how is it to be done? We have no art in Ireland; I have got thousands of pounds' worth of so-called Irish art in my church, and it is so bad that I would gladly make a present of it to anyone who would cart it off." They may have got thousands of pounds' worth of church-decoration done in Ireland in their churches, but they have no Irish art. With the very few exceptions that I have before referred to a real artist never entered an Irish church. It is true that church-decoration done in Ireland is perhaps as good or as bad as the foreign work that we are so enamoured of. But I do not recommend such work. After all it is not absolutely necessary to decorate a church. No national decay would justify bad art. Bad art is bad art, whether it is produced in Ireland or in Germany. It is time the country is rid of it. Plain churches with white glass windows are not offensive; badly painted churches with senseless knobby carving and gaudy picture glass are. The first step is to put a stop to all orders for bad work, foreign or native. The second is to agree to develop Irish art if it be at all possible. For this purpose I suggest that a society be formed, to be called, say, "the Irish Art Society," open to priests and laymen at a nominal subscription; that this society be directed by a committee consisting of bishops, priests and laymen interested in church decoration, as well as real artists capable of advising on expert questions. This society, representative as it would be of the whole consumptive side of church decoration in Ireland, would be in a position to bring its powerful influence to bear on Irish producers of church work, to compel and enable them to do work of a high artistic level. We have in Ireland artists who will answer to the call. In stained glass manufacture the outlook is hopeful. I do not intend to find much fault with Irish stained-glass makers in the past; they did bad work, but from the point of view of art not worse than the firms in England or Munich. They fought against tremendous odds. They had to contend with the prevalent belief that Irish work was so inferior to the wretched Munich refuse that it could be done at any price. As the unfortunate Irish maker had to live he was forced to turn out work mechanically, perhaps, inferior to the German glass, but still the best he could produce at the money. Fortunately this movement in favour of church art synchronises with the action of a public department that makes me full of hope for the future of stained glass in Ireland. The Department of Agriculture and Technical Instruction, in furtherance of the enlightened policy which has guided its action since its start, has, I am aware, made arrangements to bring to Dublin as a teacher in the school of art the best available stained-glass artist craftsman to be had. In the course of it is to be hoped that a school of real artists in glass workmanship will spring up in Ireland. In the meantime the services of Mr. Child, who was the chief helper of Christopher Wall in the revolutionary return to art stained-glass production, will be available in his spare time—which will be considerable—for the stained-glass firms in Ireland, either to supply designs or superintend their work or both. If the stained-glass firms are wise they will take advantage of the opportunity, for it will be a means, apart from art considerations, of establishing a very large industry in Ireland. In sculpture and painting the prospect is, if anything, brighter. It was one of the curious anomalies of the way in which church work was hitherto done that while we have all along a certain number of painters and sculptors in Ireland, no church work was ever given them to do. In other words, the only real field of art consumption in Ireland was shut to the artist. A start has been made in the production of really artistic church sculpture. I have heard that some good work has just been done in Letterkenny Cathedral, and Dr. Healy, whom the subject forces me to mention, has engaged Mr. John Hughes, a sculptor of whom any country might be proud, to do the modelling and carving for his new cathedral at Loughrea. Mr. Hughes has the highest reputation among artists for the quality of his work. He has now gathered about him

BLACADER'S CRYPT, LOOKING NORTH. PHOTOGRAPH BY A. G. HENDERSON.

a small school animated by his own lofty art ideals. It is a pity, with men like these to do the work, that statues, dull and expressionless as the marble from which they are made, should still be imported into Ireland. There are also a number of excellent carvers in Ireland, who for bread and butter had to do much of the inferior work that floods our churches, and who in the wake of an intelligent movement may be drawn to produce art. A visit to the Royal Hibernian Academy will convince anybody that even the worst academicians are able to paint better than the best of the so-called artistes from abroad, with whose work we are all familiar, while several of the artists have produced paintings eminently suited to church decoration, such as Miss Purser's work in Sir Patrick Dun's Hospital. What is wanted is really some means of contact between the consumer and the producer, and this the proposed Art Society will establish. I have not touched on woodcarving or brass or silverwork or enamelling, which at present are practically all foreign produced, though I believe it would be quite possible to establish these industries in Ireland. The Art Society could easily influence the department charged with technical instruction, which seems only too anxious to develop Irish art, to establish schools for the teaching of these art industries. To these facts, as a further strengthening of hope in the future, I must mention the revolutionary change there has been recently accomplished in educational systems in Ireland. The National Board, owing largely to the heroic efforts of one or two men whose names I need not mention, has arrived at some conception of what real education is. It has for the first time recognised that children have minds and hands and eyes. It has, too, in a hesitating and uncertain but now sufficiently decided way at last acknowledged that Irish children are to be taught on Irish lines and directed to Irish ideals. In the future, when children have been made accustomed to pencil, which is now in every hand, we may hope that the old art sense, deadened for centuries by false ideals in education and art, will spring up anew to perfect the art of early Ireland, an art which never decayed, which was merely arrested by outside forces, but which, we may reasonably hope has awaited our day to receive its fuller life. That the possibility of bringing about an art revival is not a visionary project is proved by what has happened in Belgium. Forty years ago Belgium church art was at a lower level than ours. To-day there is a living ecclesiastical art in Belgium, owing to the exertions of a few enthusiastic workers, such as Baron Bethune, of Ghent, the architect, E. H. King, of Bruges, and others, seconded by the enlightened aid of the Belgian Government. The first school founded at Ghent had only ten pupils; to-day the same school has 600 students, while other flourishing schools exist at Brussels, Tournay and Liege. There all the arts are developed according to distinctive types founded on the wonderful mediæval Flemish art. These art schools of the Guild of St. Luke are every year turning out numbers of artistic craftsmen who produce for Belgium and elsewhere the highest form of industrial and church art. I have spoken at perhaps too great length on the art side of the possible industrial movement in church work. I had to do so to prevent myself from being misunderstood. I have spoken from the conviction that Irish priests have the power to make Ireland an art centre worthy of the best traditions of ancient Irish art. I have spoken in hope of making Ireland the centre of a very widespread industry; of keeping some, at least, of those thousands of the best of our race now yearly leaving us at home.—("Irish Builder.")



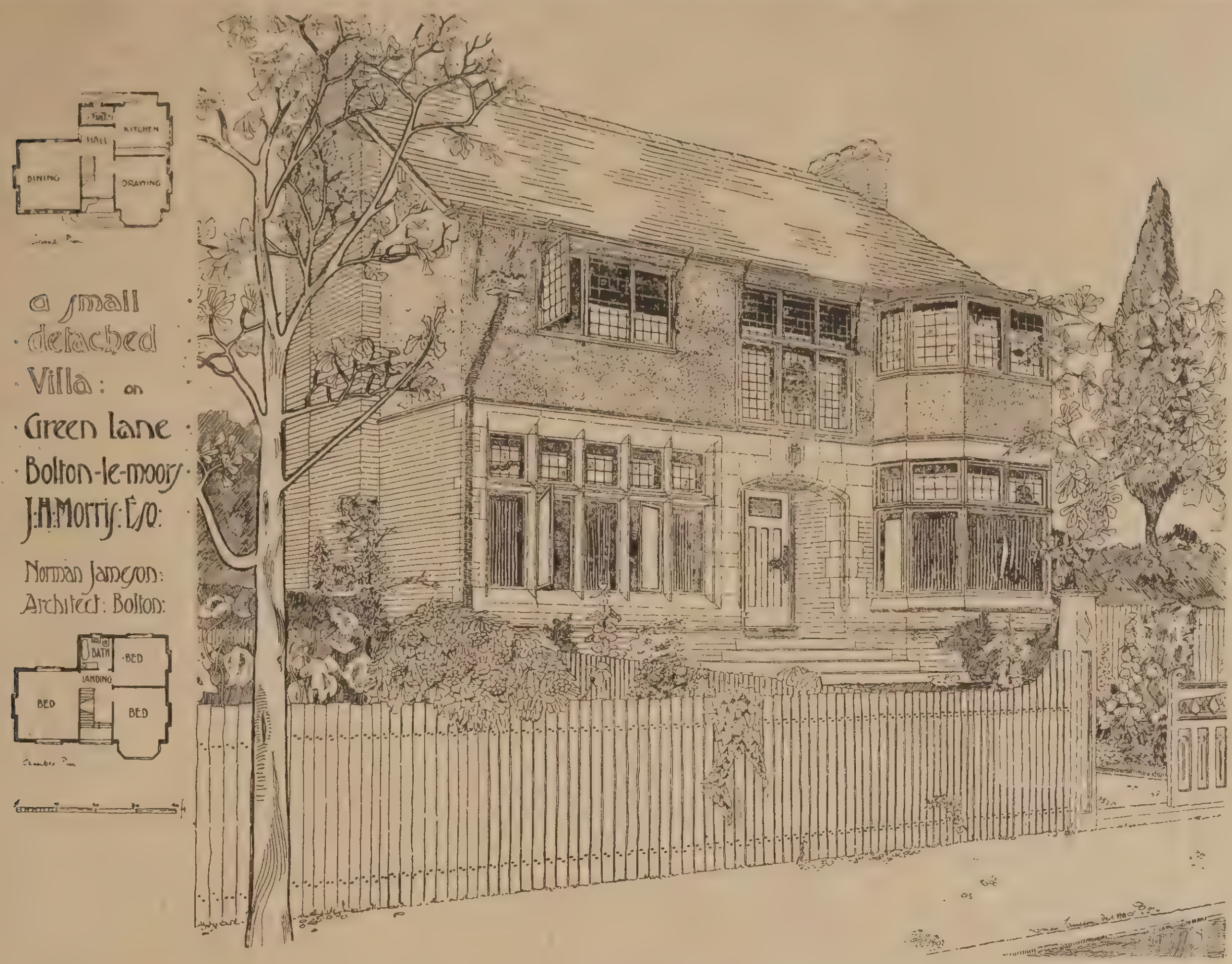
DETAILS OF ROOD SCREEN, GLASGOW CATHEDRAL. MEASURED AND DRAWN BY A. WAGSTAFF.

Villa at Bolton-le-Moors.—The small detached villa by Mr. Norman Jameson, architect, "The Albany," Bolton-le-Moors, is to be built of Ruabon bricks, with bright York stone dressings, Derbyshire spar rough-cast, and a covering of green Buttermere slate. Inside it will be finished with stained canary wood and art metalwork.

THE NEW PUBLIC OFFICES.

Models Insisted upon by the House of Lords.

ON Tuesday last week in the House of Lords, the Earl of Wemyss called attention to the proposed public buildings at Whitehall and Parliament Street, and moved a resolution expressing the opinion that models of the buildings should be made and publicly exhibited, as recommended by Professor Aitchison, late president of the Royal Institute of British Architects, and by the present president and council of the institute. He quoted a memorial signed two years ago by 140 peers in favour of the exhibition of models and the taking of precautions to ensure the erection of a War Office building worthy of the site. If there were any difficulty owing to contracts having been taken, it was not, he contended, beyond the power of adjustment. The Earl of Pembroke thought the noble lord would realise that if two years ago the Government felt it out of their power to accede to a similar motion, it was much more difficult now to make any alteration in the buildings, as in the course of two years an enormous amount of work had been done. The Earl of Wemyss said all that had been done was to clear and excavate the ground and to spread over the basis a sheet of concrete. Not a single brick had been laid. The Earl of Pembroke said he had not understood the noble lord to suggest that the Government plan should be dropped and something else substituted. He was the more surprised at this as they knew that the noble lord had got a baby of his own, and he had expected him to produce it from under his coat at any moment. He had rather gathered, with a feeling of thankfulness, that the noble lord had realised at last that the Government had decided the question of these buildings. The foundations in the case of the War Office had been laid in. The Earl of Wemyss said they had not. The Earl of Pembroke said the noble lord drew a distinction between the actual foundations being laid and the ground being covered with concrete, and apparently thought that the latter work had been done so well that it was ready to receive any building. But the Government had no other proposal before them, and the plans and elevation adopted had been generally approved. The reference in Professor Aitchison's letter to a model of the buildings was only incidental, the object of his letter being to urge the importance of the appointment of two architects for such public buildings, lest the work should be interrupted by death. The noble lord, who had as good knowledge of architectural matters as any one in that House, had warned them that unless they took great care there might be a repetition of the new Admiralty building. He confessed he shared the noble lord's dislike to the exterior facade of the new Admiralty buildings, but the Government, in considering the new buildings for the War Office, were particularly careful to avoid the system under which the Admiralty buildings were built. Those buildings were the painful result of a Select Committee of the House of Commons, and that result, he thought, had proved conclusively that a Select Committee of the House of Commons was probably one of the worst judges of matters of this sort. He supposed there was no subject in which there was more room for difference of taste than architecture, with the exception of ladies' dress. The noble lord was a great authority on architecture, and had done a great deal in that line himself, and he was afraid he could not dissociate the noble lord from his own talent. But even he would not say, he supposed, that work which he had approved, and which was satisfactory to many, was not open to criticism. They would never get everybody to agree on such subjects. He remembered an incident that occurred to himself when a very young man. In discussing the question of a public building with an architect, who, he believed, was at the time very eminent, he very rashly said, "Why don't you take a copy of some well-known building of acknowledged merit, and so avoid criticism?" To this the architect replied, "To do that would be to leave no examples of Victorian Imperial architecture." He was young then, and, with little thought, said, "Do you speak seriously and say that posterity will suffer



for the absence of such examples?" He feared the artist was annoyed, and the conversation did not continue further. It was wrong to make such a sweeping condemnation, and he had since learned to value a large amount of good work produced during the Victorian era. His noble friend was an admirer of Inigo Jones, and he shared that admiration; but it must be recognised that the work of Inigo Jones had to be adapted to modern requirements, and for these requirements a modern architect must be engaged. The eminent architects, now unfortunately taken from us, who drew up the plans for the contemplated building commenced by satisfying internal requirements for a public office and then prepared a facade worthy of such a structure. The plans and elevations would be faithfully followed, and those who were responsible for the building did not ask for models. The plans had received general approval, and he saw no reason for going to the expense of £600 for a model. His noble friend had referred to a memorial to which many of their lordships attached their signatures, but experience should show, he would not say of what little value were such documents, but how dangerous it was to rely upon them. If this was so on ordinary occasions, how much more so in this case, when the extraordinary persuasive influence of his noble friend was exercised upon noble lords inclined to give their signatures out of the respect and affection entertained for the canvasser. The Government could not accede to the motion of his noble friend, and could see no good purpose that would be served by preparing the model.

Lord Tweedmouth thought if the Department were perfectly satisfied with the plans prepared there should be no objection to preparing the model. The expenditure of £600 would be but a drop in the ocean of the entire cost, and certainly there could be no better way of satisfying public opinion. He was inclined to support the motion. Lord Stanmore supported the motion and pointed out the mistakes that critics without technical knowledge were prone to make when forming opinions from plans and elevations instead of from models. He agreed that before great public buildings were erected models should previously be prepared.

The Marquis of Lansdowne said the discussion had raised two distinct questions—first, whether as a general rule it was desirable they should have models; and, secondly, whether that procedure would be appropriate to the buildings in construction opposite the Horse Guards. He would not dogmatise, but he had some doubts whether a model always gave a perfectly clear impression of the effect which a building when erected would produce. Unless it were a model on a colossal scale, it would probably fail altogether to do so. It should also be borne in mind that unless the model included the whole neighbourhood it would give an inadequate impression of the appearance of the buildings when completed. He remembered citing, in regard to these particular buildings, the colossal edifices known as Whitehall Court, immediately to the rear of the site of the New War Office buildings, for the construction of which the Government were not responsible and which had the effect of dwarfing any smaller buildings placed in their proximity. In regard to procedure by model in the case of these buildings, the House probably would not support the motion of Lord Wemyss. Nothing could be more unfortunate than that the long delay that had already taken place should be added to by re-opening once more the whole question of the designs of those buildings. Those designs were adopted, upon the recommendation of the Institute of British Architects, after three leading members of the profession had been employed. He believed those plans met with general approval. If the matter were re-opened, they had no security that these buildings would be completed in the near future. He spoke with knowledge of the immense inconvenience to which the War Office had been put by having to transact its business in eleven buildings scattered over different parts of London, and he earnestly trusted that further delay would not be involved. He hoped they would adhere to the designs which, after a great deal of consideration, had been adopted of the buildings referred to, which were creditable to the architect and would form a great addition to the architectural beauty of that part of London. The motion was then carried, forty-one voting for it and twenty against, majority twenty.

THE LONDON COUNTY COUNCIL

AT the meeting last week, in answer to questions on the report of the Highways Committee, Mr. Benn said that the Council had no power to prevent the New River Company from breaking up the Embankment. He would lay before his committee the question of obtaining powers to compel the companies to use the old subways instead of breaking up the streets. A long discussion took place on a recommendation of the Housing of the Working Classes Committee to send three of their members as delegates from the Council to attend the proposed conference in Glasgow in September next on the question of cheap dwellings, and that the out-of-pocket expenses of the delegates attending should be paid by the Council. Mr. McKinnon Wood moved an amendment to leave out of the recommendation all reference to the payment of expenses. In the course of the debate on the amendment several members spoke against any payment being made to members of the Council when sent on such missions as this, pointing out the danger involved in breaking the rigid principle to which the Council had up to the present adhered. Other members asserted that it was unfair to set up any monetary barrier which might prevent some councillors simply for pecuniary reasons from doing good work for the ratepayers, and urged that in the matter of sending deputations the Council should follow the example of many of the great provincial corporations. On a division the amendment was carried by 45 votes to 41. The recommendation as amended was then adopted. In answer to Mr. Burns, M.P., Lord Monkswell (chairman of the Parks Committee) stated that, with regard to the question of the preservation of the view from Richmond Hill the vendor of the property had met him in the most friendly spirit. He would have several proposals to put forward at the conference to be held at Spring Gardens on Friday, which would be attended by delegates from the councils of London, Middlesex and Surrey, the Richmond Corporation, the Twickenham Urban District Council, and various open space societies. He very much hoped they would be able to come to some satisfactory conclusion.

Views & Reviews.

Rough Pricing.

This book is intended as an aid to architects, surveyors, engineers and others in ascertaining the rough approximate cost of any class of building or general work. The plan of the author's "Price Book for Approximate Estimates," which met with favour, has been extended in the present work. The whole of the subject-matter has been arranged alphabetically, with numerous cross-references in order to save time. At the end in an appendix is a list showing the actual cost of a few representative buildings and works. Of course this book gives only a very rough and ready means of "getting somewhere near" the real cost of the building, but we will not condemn it because of this—it has a considerable value to those for whom it is intended, and will be found most useful when consulting with clients or for giving them an idea of what the work is likely to cost or of what can be done for a certain price. The book undoubtedly fills a gap in the line of vade mecums. The majority of architects and engineers are proverbially ignorant upon the subject of prices, being concerned but little with actual building, and it is to these the book will be most useful. For the pricing of detailed bills of quantities the book is not of the slighest use, however, as the items are lumped together in such a comprehensive manner that they cannót be picked out separately. The book is only intended to give the means of estimating by rough quantities, per foot cube, per square, or per unit of accommodation. The author accurately states that "one of the most fruitful causes of dissatisfaction and unpleasantness between architect and client consists of an unreliable and misleading estimate of cost. It is, therefore, absolutely necessary to devote a considerable amount of care and attention to the preparation of both detailed and approximate estimates, so as to insure satisfactory results." We agree with Mr. Coleman in this, and we would go further and say that no architect, engineer, surveyor or other should call for tenders until he has made or had made a careful and fairly complete detailed estimate and is assured that the client is fully prepared for the worst. To obtain prices from builders and then not go on with the work or cut it down considerably is not right, as they are thus put to unnecessary expense and trouble through the architect's own incompetence or want of taking pains. We suggest to Mr. Coleman that he would be doing considerable service if he were to prepare another small book for the preparation of detailed estimates, giving the work in trades and accurately specifying the work the prices are given for, with a good index giving each item. This question of stating accurately what degree or kind of work he is giving prices for needs attending to in this present book. To illustrate what we mean we will quote item No. 481: "Reclamation of Land. As from tidal estuaries, foreshores and sea encroachments. Cost varies considerably according to locality, extent of land to be reclaimed, nature of embankments or sea-walls required, &c. £20 or £30 per acre." What does the £20 stand for and the £30; what is the extent of land to be reclaimed; what the nature of embankments, what is the locality, &c.? The actual costs of executed works in the appendix are the most useful, being the most reliable in the book, but altogether, as we have said before, it supplies a distinct want. The binding, type and get-up of the book is admirable, as with all of Messrs. Spon's note-books.

"A Price-Book for Architects and Engineers." By T. E. Coleman, F.S.I. London: E. & F. N. Spon, Ltd., 125, Strand, W.C. Price 5s.

A Builders' Year-Book.

This year-book for master-builders belonging to the Lancashire, Cheshire and North Wales Building Trades Employers' Federation has just been published for the first time. The book should meet with considerable success, as it gives a large amount of most useful information in a handy form. The names and addresses of members of the various master-builders' associations in connection with the federation, and their officers are given, with the rules. Forms of contract and sub-contracts approved by the federation are also given. Then there is general information for builders, tables, &c., and at the end a diary from July, 1901, to July, 1902. It will be seen that the price of 1s. is a small one for such a useful and comprehensive book.

"The Building Trades Employers' Federations and Master-Builders' Year-Book and Diary, 1901-2." Compiled and published by Robert Hall, Builders' Quantity Surveyor, Frederick Street, Bury. Price 1s. nett.

WYMONDHAM CHURCH.

WYMONDHAM CHURCH is to be restored. The vicar has explained that the lead is proposed to be removed from the whole roof of the church, and re-cast on the spot, so that the old metal would be properly utilised again. Every inch of the old woodwork of the beautiful roof which can be preserved will be retained, and such parts as were too far gone will be carefully copied. The great western tower will be completed externally as nearly as possible in accordance with what the vicar states was evidently intended when it was built, an interesting example of which was furnished in the tower of Redenhall Church, which was built about the same period. The eastern tower would not be interfered with, except that it will be protected so far as can be done without altering its present appearance. The western window of the north aisle will be opened, preserving every vestige of the presént mullions and tracery that can be made use of, and supplying decayed parts where necessary with accurately fitted work of similar pattern. With regard to the interior, the present gallery, an unsightly and unecclesiastical erection, will be removed; the great western arch, now almost hidden up, will be thrown quite open from top to bottom, the organ being brought some feet lower and re-erected on a new screen of three arches to be placed somewhat to the west of that arch, in a position already indicated by the springers which remain. The ceiling or roof over the organ will be carried up to the height of the arch in accordance with the original design, which is evident from the fan-shaped springers, and will be of oak and groined. The font will either be placed in front of the organ screen or in the north aisle, near the entrance from the porch. This alteration will add no less than 60ft. in length to the seating accommodation of the nave. The present vestry at the west end of the south aisle, formerly fitted up as an archdeacon's court, and which is an encroachment, will be entirely removed and the south aisle correspondingly enlarged. In the north aisle the small entrance door at the east end will be closed, and a side altar, which will be available for weekday and early services, will be provided, the seating accommodation, however, being made available for the general worshippers at other times. The present seating throughout the church, pews as well as the old-fashioned and awkward square erections commonly called "loose boxes," with their great waste of space, will be entirely removed, and proper wooden benches substituted, with the result of adding greatly to the seating capacity. The floor of the nave and aisles will be lowered about a foot, to its original level as shown by the bases of the Norman columns, which remain untouched. The surface will be thoroughly concreted, and then laid with York stone. The space at the east end of the south aisle formerly used as vestries for the parish clergy and the monks will be used as a choir vestry, having entrances therefrom into the choir, as well as into the south aisle, and will be built on the old foundations. The clergy vestry will be placed in the base of the old eastern tower in such a manner as to be scarcely observable from the outside. The doors from the sanctuary, which have been closed up ever since 1410, will be reopened and iron-framed doors inserted. The floor of the choir will be laid with slabs of black and white marble, and will contain the clergy and choir stalls, the latter affording accommodation on either side for seven men and eleven boys, with seats in the arches for four lady choristers. The sanctuary will be raised to its original level as shown by the position of the so-called Abbot's monument. The choir organ will be placed on the south side of the choir, where also will be the console, which will enable the organist, while sitting with the choir, to control both that instrument and the great organ at the west end, which will be connected, as is usual with modern organs. The pulpit will be brought forward one bay on the south side of the nave, the lectern being placed on the north side of the nave near the clergy seats. The sanctuary will have a lofty reredos of marble above, and the wall above it will be either diapered or painted in fresco. The site of the old church of St. Margaret, through which there is at present an entrance to the north aisle, will not be interfered with except to put it in decent order. The chandelier will be removed from its present position, in order to ensure the preservation of such a valuable relic, until the restoration is completed, when it will be placed in some position not yet decided on. The organ will be practically rebuilt, although the pipes and outer case will be retained. It was constructed in 1793. It is expected that the costs of these necessary improvements and additions will amount to at least £10,000.

Engineering Notes.

The second edition of Geipel and Kilgour's "Pocket Book of Electrical Engineering Formulæ" has just been issued by "The Electrician" Publishing Company, London, price 7s. 6d. nett. The authors, who both occupy a prominent position in the electrical industry, and are in close touch with the latest practice in all matters relating to the applications of electricity to industrial purposes, have carefully revised and added to the matter which forms the chief contents of the book. Electric traction, the transmission of electric power, and the many other subjects which since the first publication of the Pocket Book have come prominently to the front, have been given special attention, with the result that the book contains over 850 pages. The use of a thin hard paper and a compact binding has enabled the publisher to reduce the bulk of the work, which is, notwithstanding the mass of matter crowded between the covers, not too large for the pocket.

The New Millbay Railway Station at Plymouth is nearing completion. The whole site has been remodelled. The local Great Western Railway staffs have moved into their new offices, which are situated on the first floor of the station building. The main entrance to the offices is opposite the Duke of Cornwall Hotel, and at the top of a short flight of stairs long corridors branch off on either side. The divisional superintendent has an office on the immediate left, and his assistant is provided with a room on the right. Adjoining both offices are large rooms, furnished and well lighted, for members of the staffs. At the end of one of the corridors another passage runs at almost right angles. Here offices are provided for the district goods manager and his assistant. All the offices are roomy and well furnished and ventilated, and each staff is provided with excellent lavatory accommodation. Ample platform accommodation is provided at the station. Four platforms run into the station, No. 1 being 300ft. long, Nos. 2 and 3 500ft., and No. 4 is to be extended another 100ft. to give it a total length of 600ft. Probably the exact extent of the whole area covered by the new station will not be appreciated until the existing booking office is taken away and all the new ground floor offices are opened up to view. Immediately outside the booking offices a glass roof awning is now in course of erection, and is intended for the convenience of passengers arriving and leaving in wet weather. The covering is 110ft. long, with an average width of 50ft. The first and second-class booking-office has a separate entrance, and close by the third-class booking-office there will be a special entrance for luggage. The offices surrounding what is known as the circulating platform include those of the stationmaster, telegraph, parcels, cash, and porters. The waiting-room and lavatory accommodation is much superior to that usually provided, and the artificial paving on the platforms gives the spacious station a clean appearance. The new station is entirely of dressed limestone.

Queen Victoria Memorial.—Mr. Akers-Douglas stated in the House of Commons in reply to a question that the executive committee has selected a design, and that it will be submitted to the King and to the general committee this week.

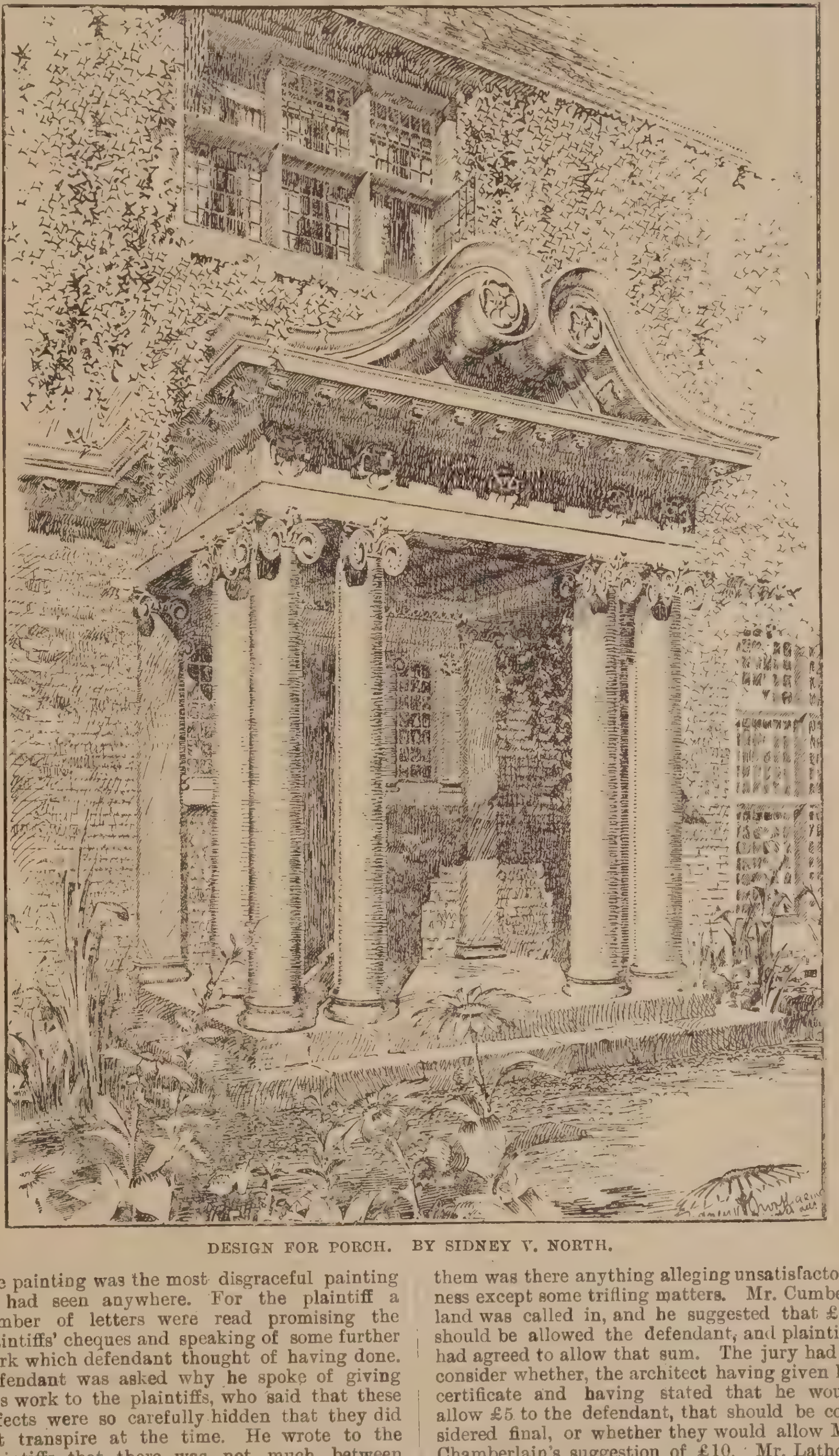
Law Cases.

Suing for Paving Stones.—Before his Honour Judge Gwilym Williams at Ystrad last week David Williams, saddler, Treherbert, sued Messrs. Edward Davies & Sons, builders, Treherbert, for £18 16s. 7d., which he alleged was due for paving stones, &c., from a Cymmer quarry. There was a direct conflict of evidence, and his Honour in giving judgment made some very strong remarks. He said that Mr. Williams's evidence was not in any way supported, and the probabilities of the case were against him.

A Builder's Claim.—Joseph Ford, builder, of Rosedale, sued James Masterman, farmer, of Hartoft, at the Malton County Court recently for £10 2s., for work done at his house and farm buildings. Mr. Kitching, of Pickering, was for plaintiff, and Mr. John Estill, of Malton, for the defendant, who paid £8 5s. 2d. into court, as sufficient for what work was done and for costs. Plaintiff deposed that he and his brother were employed for forty-four days at the farm, and he had charged 4s. 6d. per day, whilst 4s. 6d. worth of material was used. The work done was mainly re-tiling roofs, re-building a small wall and laying three thresholds. Cross-examined by Mr. Estill, plaintiff said he was a farmer before he turned builder, at which latter trade he had been engaged five years. He had charged 4s. 6d. per day, which was the usual charge of the district. He denied that an ordinary practical workman could have done all the work in fourteen days. Mr. Estill called several witnesses (including the agent for the property, Mr. Horsfield, land agent, of Norton, and Mr. Shepherdson, architect, of Driffield) to prove that the amount paid into court was a very liberal allowance for the work done, which ought not to have taken more than a fortnight and which was of an inferior character. His Honour said he thought the amount paid into court was quite sufficient, and he gave a verdict for defendant beyond that sum.

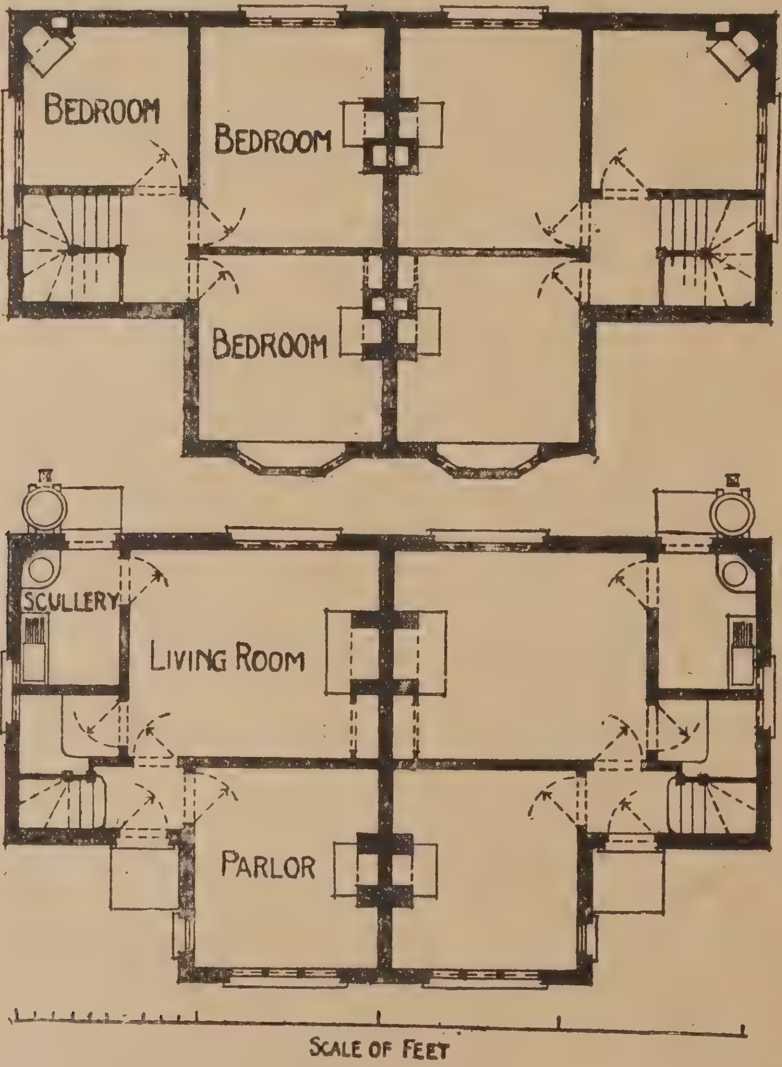
A Dispute with a Builder.—A case in which Mr. Henry Statham, builder, of Brighton and Southwick, sued Mrs. Bannister, wife of Mr. George Bannister, of Southwick, for the balance of the contract price of £600 for the erection of two houses at Southwick, was heard recently before Mr. A. O. Jennings, as special referee, at the County Court House, Brighton. The claim was originally for £165 11s. 9d., and a writ in the High Court was issued. On the hearing in London it was ordered that the defendant should pay £119 8s. 6d. within seven days, and that she should be at liberty to defend the action as to the residue. The residue was for £46 3s. 3d. and a small sum for interest. It appeared that the plaintiff estimated for the erection of two houses at Southwick for Mrs. Bannister at the price of £600, and the contract provided for the payment from time to time of 75 per cent. upon the value of the work done. The works were to be completed on the 25th January last under a penalty of £2 per week for each week after that date that the premises should remain incomplete and unfit for occupation, except for an allowance for inclement weather. The work was not completed by the stipulated time, but the builder contended that the delay was caused through bad weather and through the defendant not making advances as stipulated. Sums amounting to £450 were paid by the defendant on account of the works, and the original claim of £165 11s. 9d. was composed of the balance of £150 and £15 11s. 9d. for extras. The defendant denied that any extras were ordered, and claimed to deduct £28 in respect of fines and £2 11s. 6d. paid to another builder for work left unfinished by the plaintiff. Mr. Statham, giving evidence, stated that some of the extras were required by the district council's surveyor. Mrs. Bannister or her surveyor also sanctioned the work. He stated that the buildings were completed on the 19th February, except the forecourt walls, which had been destroyed by frost. Nevertheless he had not been able to obtain a certificate of completion from the defendant's surveyor, who kept asking for fresh work, including work which was not covered by the contract. Eventually, after consultation, the counsel for the respective parties came to a settlement on the terms that the defendant should consent to judgment against her for £37 and costs.

Claim for Balance of Contract.—At a special County Court held at Luton before His Honour Sir A. G. Marten the action of *Ayre* v. *Lathom* was resumed. This was a claim brought by Messrs. Ayre & Son, builders and contractors, Hockliffe, against Mr. H. W. Lathom, solicitor, Dunstable, for £58 10s. 6d., balance of contract for alterations to the defendant's residence, Princess Street, Dunstable. Mr. Lathom gave evidence on oath in his own defence. He went through a series of items on which he contended that he should be allowed rebates amounting to £58 10s. 6d. Speaking of the painting, defendant said there were places where there was only one coat, and the whole of the rooms he had had to have painted as soon as the contractor left.



DESIGN FOR PORCH. BY SIDNEY V. NORTH.

The painting was the most disgraceful painting he had seen anywhere. For the plaintiff a number of letters were read promising the plaintiffs' cheques and speaking of some further work which defendant thought of having done. Defendant was asked why he spoke of giving this work to the plaintiffs, who said that these defects were so carefully hidden that they did not transpire at the time. He wrote to the plaintiffs that there was not much between them, meaning to say that plaintiff claimed £58, and he thought he was entitled to £51, so that there was not much between them. He had paid a fair sum into court. Defendant drew the plans. He used to practice as a surveyor. He would not swear that the alteration showing the insertion of a bay window was on the original plans; he thought he did it himself. His Honour said the defendant seemed to dispute five items of the work done in which he claimed to have an allowance made and nineteen items in which he claimed that the work was not satisfactorily done. But the jury must remember that the architect's certificates was given by Mr. Kelly on January 13th, 1900, in which he stated that he was satisfied with the work, with the exception of a few trifling items for which he allowed a rebate of £5. Then there were letters written at different times by the defendant showing his satisfaction with the work; such letters were written in January, March, April, July and August, and in none of them was there anything alleging unsatisfactoriness except some trifling matters. Mr. Cumberland was called in, and he suggested that £10 should be allowed the defendant, and plaintiffs had agreed to allow that sum. The jury had to consider whether, the architect having given his certificate and having stated that he would allow £5 to the defendant, that should be considered final, or whether they would allow Mr. Chamberlain's suggestion of £10. Mr. Lathom said it was unfortunate that Mr. Cumberland came to inspect the work when there was no one at home but the servants, but Mr. Cumberland was a gentleman of great experience, and he did not think he would be likely to miss anything which he should have seen. The point was whether defendant's case was exaggerated or whether he really had good cause to say the work had been unsatisfactorily done. The ceilings appeared to have cracked through bad materials having been used, and in the outside piping there was a split which showed it to have been defective. But on the other hand they had to consider whether the terms of the contract were not conclusive, so that any complaint to be made should have been made within the three months therein specified. If a man concluded a contract in the autumn of 1899, he thought it incumbent on a person alleging that the work was unsatisfactorily done to have made such complaint at once so that the matter could have been inquired into at once, and that it ought not to have been left over until the time when defendant made his complaints. He thought the jury should award plaintiffs the sum claimed or any lesser sum which they might agree upon as a just settlement. The jury, after a brief consideration, found a verdict for plaintiffs for £48 10s. 6d., this being the amount claimed less the £10 rebate agreed upon. His Honour gave judgment for the amount stated with costs.



GROUND- AND FIRST-FLOOR PLANS OF LABOURERS' COTTAGES AT MAIDSTONE.
E. HARDING PAYNE, A.R.I.B.A., AND JOHN OWEN, ARCHITECTS.

The Housing Question.—The Metropolitan Tribunal of Appeal sat at the Surveyors' Institution, Westminster, last week for the purpose of hearing an important appeal in connection with the erection of dwellings for the working classes. The appellants were the Metropolitan Association for Improving the Dwellings of the Industrial Classes, and the respondents were the London County Council. Mr. Andrews appeared as counsel for the London County Council, whilst Mr. Gruning, F.R.I.B.A., represented the appellants. It appeared that the appellants proposed to erect some buildings at Stoke Newington. The council refused to sanction the plans on the grounds that there was no guarantee that the houses on either side of the proposed new buildings would be altered in the course of years in such a way as to prevent proper air and light space. Mr. Gruning said the council had no objection to the plans of the buildings, and he thought the appeal should stand. Mr. Andrews, for the London County Council, said the council had no desire to hamper any scheme which aimed at endeavouring to ameliorate the conditions under which the working classes lived. They were bound to object in this case, but if the appellants agreed to certain modifications the council would withdraw opposition. The tribunal upheld the appeal, making an order, however, for certain modifications.

Claim by a Plumber.—A man named Francombe, plumber, Cardiff, sought an action at Cardiff against Thomas Evans, builder, Cathays, Cardiff, for the recovery of £16 for plumbing work carried out at some of the defendant's houses at Ebbw Vale. The defendant contended that the plaintiff had not carried out his contract. Councillor W. H. Allen, Cardiff, who had examined the houses at Ebbw Vale at the request of the defendant, said the plumbing work carried out by the plaintiff was the most disgraceful he had ever seen. In one case the joints were left open, so allowing the sewer gas to escape, and several of the pipes were jointed with putty. Other joints were made with rags. Plaintiff said other plumbers had been employed at the houses, and it was possible some of the joints had been done by them. As the work had to be carried out to the satisfaction of the architect, his Honour adjourned the case in order that the architect might be called to state whether the work satisfied him or not. At the resumed hearing Mr. David Morgan, architect, gave evidence, and his Honour gave judgment for the defendant.

Dispute by Contractors.—C. H. & Joseph Moult, builders, Stapleford, sued Cephas Allen, Stapleford, in the Long Eaton County Court recently to recover £34 19s. 8d., balance of contract for erecting a house. The case was that the contract was entered into between the late Mr. Moult and defendant to complete the erection of a house for £285. Mr. Martin failed, and Mr. Leeman was appointed trustee. Mr. Moult died, leaving his sons to carry on the business and his executors. There was to be £11 allowed for grates. Some material was in Mr. Martin's yard, and it was to be used by Mr. Moult. Mr. Thorpe said there was a balance due of £34 18s. 8d., but a reduction had taken place to £30 9s. At the sale the material was sold. The defence was that no material of any value for building was in the yard, and that no contract existed with respect to it. A question of a bay window also arose. When Mr. Moult died, an arrangement was made for Messrs. Moult to complete the work. His Honour thought the house would be cheaper by paying the claim than the original contract. Mr. C. H. Moult said that no complaint was made about the work. Mr. Thorpe said every effort had been made to settle the matter before going into court. After the defence had been heard his Honour gave judgment for £30 9s.

A Building Line Case.—The case of *London County Council* v. *Ellis* recently came up before Mr. Justice Darling and Mr. Justice Phillimore, in the King's Bench Division. Mr. R. Cunningham Glen moved on behalf of Mr. James Ellis for an order calling upon Mr. d'Eyncourt, the metropolitan police magistrate, to show cause why he should not state a case for the opinion of the King's Bench Division. Two summonses had been issued by the London County Council against Mr. Ellis under the London Building Act, 1894, for erecting a building beyond the general line of buildings. Mr. Ellis had an old building at the place in question, and he proceeded to erect two other buildings, but objection was taken that if he erected them as a separate structure he would be contravening the Act by building beyond the building line. He then made what was really an extension of the old building, but the magistrate found that there were really two buildings, and he ordered the demolition of the new one. If it was an extension of the old building its erection did not contravene the London Building Act. The magistrate held that the point was a frivolous one and he refused to state a case, but counsel submitted that it was not, and that the magistrate should be ordered to do so. Mr. Justice Darling said that there must be no rule. The applicant wus the owner of an old building, and at the place in question there was a building line. He tried to put up some new shops to the right of the old building on a vacant piece of ground, but it was pointed out that if he did so he would get beyond the building line. He discontinued that, and then proceeded by beginning at the old building, and he attached the new building to the old and said that he was laterally extending the old building. The magistrate decided against this ingenious builder, and declined to state a case on the ground that the point that this was only an extension was frivolous. His Lordship thought it frivolous in a legal sense, and it was also frivolous in a dramatic sense; in fact it was comic. Mr. Justice Phillimore concurred. The case was carried into the Court of Appeal last week, before the Master of the Rolls, Lord Justice Vaughan Williams and Lord Justice Stirling. Mr. R. Cunningham Glen moved on behalf of Mr. Ellis for a rule *nisi* for an order calling on Mr. d'Eyncourt, the metropolitan police magistrate, to show cause why he should not state a case for the opinion of the King's Bench Division. The Master of the Rolls: The matter is of great importance to Mr. Ellis because it involves the pulling down of a building which has been erected. For this reason we think that a rule *nisi* should be granted calling upon the magistrate to show cause why he should not state a case for the opinion of the High Court. But we do not say whether the points intended to be raised are or are not frivolous, because we have not the materials before us to enable us to decide that. When the rule comes on for argument it will be open to the other side to show that the points are frivolous.

Builder v. Architect.—The award of the arbitrators has been made in respect of work done in the erection of No. 26, Vernon Road, Edgbaston, by Hiram Wilcox, late of Bradford Street, builder, for Mr. Charles Sharp Smith, architect, of Cannon Street, Birmingham. The work was done under contract on an estimate based on quantities supplied by the architect, who measured up the variations and claimed a balance of £66 0s. 10d. in his own favour, based on a claim for penalty for alleged delay and other matters. The builder's statement on a valuation by his surveyor showed a balance due to him of £258 16s. 8d. The arbitrators awarded £227 as due to Mr. Wilcox. The arbitrators were Messrs. Anthony Rowse and J. Kirkham Dale.

SOME SMALL ENGLISH CHURCHES.

TWO thatched churches, at least, are still standing in England; one at Markby, in a remote part of Lincolnshire, and another at Paston, in Norfolk; but these are by no means the only curiosities among our smaller churches. There is one built of logs at Greensted, only a mile's walk from Chipping Ongar. The little wooden steeple, the porch and brick chancel, the dormer windows of the roof, are of later date, but the nave walls are formed of massive oak logs, roughly trimmed on the outer side, and faced on the inner with boards; formerly their ends were buried in the ground, but as they had become decayed they were replaced some years ago by a base course of brick.

The Smallest Church.

Which is really the smallest church in England has been disputed, but formerly the claims of St. Lawrence, on the Undercliff of the Isle of Wight, seem to have been the strongest, for Lullington, in Sussex, its most formidable rival, was held to be disqualified on the ground of being only the chancel of a once larger edifice. St. Lawrence, however, has been enlarged of late years, for its chancel was lengthened by 10ft., and a new porch and turret were added. Prior to that operation it was 20ft. long and 12ft. broad, with height in proportion. Its neighbour, St. Boniface, at Bonchurch, is also but a tiny church, and both of them are picturesquely situated.

Perivale, near the Brent— a mile or two north of Ealing—is a little church in a little parish, though, as Greater London spreads, it will no doubt fulfil the prophecy that the "little one shall become a thousand." It is a mixture of old and newer work—the former dating from about the fourteenth century. Its tower is faced with weatherboards, and has a pyramidal tiled roof.

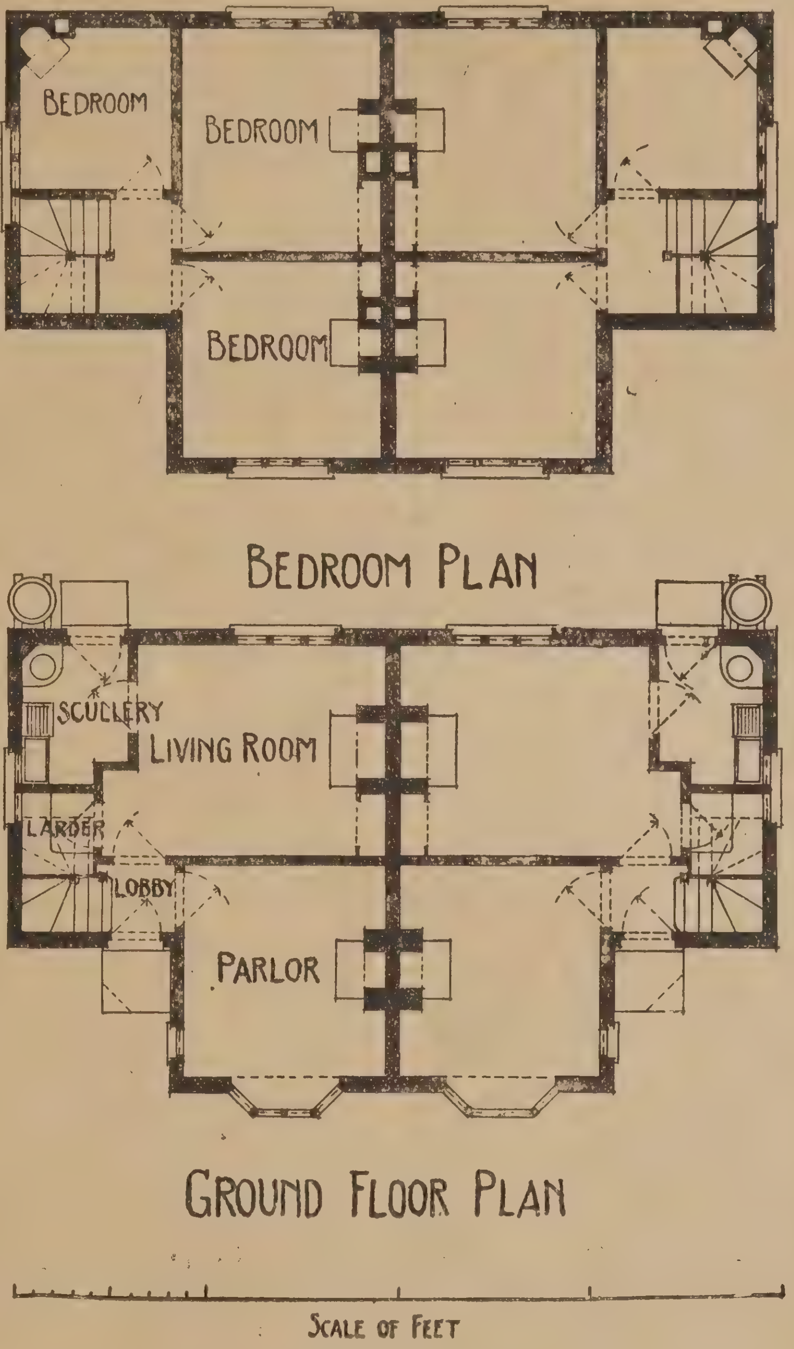
St. Michael's, Verulam,

one of the most interesting churches in England, and still anything but large, was probably once much smaller. It stands at one end of St. Albans town, and on the south side of the yet older Roman Verulam, now indicated only by some mounds and fragments of its walls. Built into those of St. Michael's, which are in part constructed of Roman brick, are small round-headed arches indicating ancient windows, and obviously belonging to the original building. The date of that is uncertain, and the difficulty of determining it is increased by the Roman materials and the rudeness of style. But it is often assigned to the middle of the tenth century, when three churches of which this is probably one, were built by an Abbot of St. Albans.

Probably older, but not quite so small, are St. Mary-in-Castro, at Dover, and St. Martin's, at Canterbury. Experts have differed as to the age of the former, but the materials are certainly Roman, and part at least of the building is assigned on good authority to the same age, while the lower part of the curious tower at the south-west, which appears to have been formerly connected with it, is generally admitted to have been built by the Romans for a lighthouse. Not so much of their handiwork remains at St. Martin's, Canterbury, though fragments can be found in its walls which carry us back to the first days of Latin Christianity in Britain.

The Little Church of Bradford-on-Avon.

One of the smallest and most interesting churches in the country is at Bradford-on-Avon. It was, one may say, discovered about forty years ago, and was afterwards gradually divested of the mean structures with which it had been encased. It consisted originally of a little nave and chancel, with porches north and south, which are, comparatively speaking, large. Of these two, the latter has been destroyed, only the foundations remaining, but the rest of the building is in very good condition. It is a small structure, for the total length is hardly more than 37ft.; but it is lofty in proportion, for the nave is more than 25ft. high. The original windows are both little and few—they must have given only a "dim religious light." The chancel arch is narrow and, in proportion, high. The walls are constructed of rather large and well-squared stones, and ornamented in the upper part externally with a shallow-panelled arcade. As it was erected in the first decade of the eighth century, or about a century after the death of Augustine, we have no more interesting relic of the earliest days of English Christianity.



LABOURERS' COTTAGES AT BIDDENHAM. E. HARDING PAYNE, A.R.I.B.A., AND JOHN OWEN, ARCHITECTS.

Sompting, in Sussex,

on the slope of the chalk downs overlooking Worthing, is anything but large, and is certainly old. The tower was erected some years before the Conquest, and is remarkable for its gables crowned with a pyramidal roof—a pattern very unusual in English churches. This is the oldest part, but there is a good deal of Norman work in the rest of the building. Also old, originally small, and of special interest as the earliest church in England actually dated, is Deerhurst, in Gloucestershire, on the banks of the Severn. The original inscribed stone stating that the church was consecrated on April 11th in the fourteenth year of Edward the Confessor (1056), is now in the Arundelian Collection at Oxford. Here also, as is so often the case, the tower is the best preserved of the old parts, though portions of the south wall of the nave and the chancel aisle are of the same age.

Heysham Church.

Another curious little church stands at Heysham, on a low headland of red sandstone overlooking Morecambe Bay. The greater part is later than the Norman conquest, but the rude chancel arch probably goes back to Saxon times, and some sculptured stones in the churchyard must also be very ancient. But close at hand are the remains of a yet earlier structure, a rudely-built chapel about 8yds. long and less than 3yds. in width, like those which are still not very rare in Ireland, and may be found here and there on our Western shores. Of later though more uniform date, but rather larger, and much more ornate, is the church of Kilpeck, in Herefordshire, which, had it not been restored with more zeal than discretion, would be a very perfect example of a Norman building.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Air-Space in Scotland.

MONMOUTHSHIRE.—J. writes: "What is your opinion as to the legality of a dean of guild court in a county burgh of Scotland rejecting plans for a rebuilding of premises on account of the want of sufficient area space at the back of same? The sketch plans (not reproduced) illustrate the buildings as proposed. The court states that an area 25ft. in depth ought to be provided. This of course would monopolise more than half of the site and render the new building quite unprofitable. The workshop being at present on the site it seems hardly reasonable that they can compel us to knock it down to supply area space."

As I interpret the clause in our Building Regulations (which, by the way, I do not consider a model of correct English that would have satisfied Cobbett) I should say the space required in each is 15ft., being three-fourths of the height of the two living-room floors 10ft. by 9ft., allowing 1ft. additional for intervening floors. Some people might try to bring in the attic also "as the highest habitable room of the building," but that would only produce 22ft. 6in., and be got by what I think an inaccurate construction of the text. CAMPBELL DOUGLAS.

Right of Light.

REIGATE, SURREY.—B. writes: "I have built a house for a client of mine on a plot of ground as per enclosed tracing (not reproduced). Adjoining and overlooking this ground is a stable which has four windows and a door opening on my client's property, and although not used at present may be used in the future. They have been built nearly sixteen years, so if anything is to be done it ought to be done at once, as a question of ancient lights may arise. (Is not the period twenty years?) What I should like to know is, can my client place an obstruction on *his* property against lights and door so as to assert his claim, or can he get an undertaking from adjoining owner admitting my client's claim and paying a nominal rent for the windows &c., so overlooking the property so that a formal notice any time would compel adjoining owner to stop up the windows?"

Most certainly your client may and should place an obstruction on his own property against both lights and door, either in the form of a hoarding or of a permanent wall, which if built of rough material might be ornamental rather than otherwise if creepers were allowed to grow over it. This obstruction must be in continuous existence for a whole year within twenty years of the erection of the stables, and therefore must be put up within nineteen years and a day of such erection. A signed undertaking from the adjoining owner admitting that he claims no right of light to his windows nor of entry to his door over your client's land would serve the purpose equally well, especially if a small rent were paid as is suggested, and as is only fair; but it would be well to have such an undertaking drawn up by a solicitor, and the only way in which to force the adjoining owner to sign this undertaking is to erect the obstruction. G. A. T. M.

Architects' Charges.

BIRMINGHAM.—E. J. C. writes: "What commission can I charge my client, for whom I have prepared two complete sets of drawings, specifications and quantities for his house, and have also obtained tenders for each set? In each case they have exceeded the amount he wishes to spend. I have still to prepare more plans for a smaller house in order to meet with the intended expenditure, for which, of course, I shall have the usual 5 per cent. and 2½ per cent. for taking off quantities."

An architect's charges under these circumstances has often to be calculated as a matter of policy rather than of right. In fact, on the question of right there is opening for dispute, for if the client gave the architect definite instructions that the building was not to cost more than a stipulated sum, and the architect prepared plans without first saying that the sum was insufficient for the purpose for a building which would cost more, no charge at all could be legally substantiated. The architect will have failed to carry out his part of the agreement. On the other hand, if the architect has been careful to guard himself, preferably by letter, saying that the sum named was not in his opinion enough for a house of the accommodation required, but that he was preparing plans as instructed with strict regard to economy but without guarantee as to cost, he would then be entitled to 3 per cent. upon the estimated cost for the preparation of drawings, with plans, elevations, sections, and specification, and for obtaining tenders. For quantities the full sum would be due. As in this instance all this work has been done twice over, it would be twice chargeable. A copy of the R.I.B.A. schedule of charges should be obtained from the secretary R.I.B.A., 9, Conduit Street, W. It costs 7d. post free.

G. A. T. M.

Assessing Fire Losses.

EDINBURGH.—FIRE INSURANCE writes: "(1) Can you supply me with the title of a book giving information on this subject? A property took fire in a village a few miles from a city. Someone telegraphed for the fire brigade from the city, there being no local means of extinguishing the fire. A settlement took place with the insurance company, and now when the proprietor is charged £20 for the services of the brigade the company refuse to pay it. Had the brigade not attended the damage to the insurance company, instead of being only £1,000, might have been several thousands. Is it not to the interest of the insurance companies to pay for and encourage people to assist in extinguishing a fire? Can they be compelled to pay? (2) Do the expenses of the lawyer, clerk of works, architect and surveyor form part of the amount claimable from the company? (3) As the preparation of the claim in detail puts an owner to considerable expense, can he claim this as part of the loss? (4) What is a usual allowance to cover contingencies, as in restoration so many unforeseen points of extra expense occur? (5) As great differences of opinion arise sometimes as to what walls ought to come down, as to renewal of parts partially damaged, and such like, what is the best and most expeditious method of adjusting these?"

(1) I do not know of any book on the subject The companies have formed themselves into a close ring, and by thus doing away with competition are in a position to insist upon the exact letter of each policy being observed. As one result, in the present instance the company can refuse to pay for the services of the fire brigade. The only way to obtain payment is to threaten to insure in future with one of the few non-tariff offices which remain outside the ring, and as this would soon be known in a country district the loss of one policy on such a ground would probably mean the loss of many more; and as all the tariff offices would suffer they would bring pressure upon the one involved in the present dispute. (2) Unless these matters have been specially provided for in the policy the company is not liable. The council of the Royal Institute of British Architects carefully went into this matter a short while ago and approached the insurance companies, but failed to obtain any concession. It is consequently now my own practice to insert a provision for architect's commission, though I have never yet had to add for the clerk of works or solicitor, and doubt whether the latter is insurable. As the charge for quantities, however, is included in the builder's estimate, this becomes payable under the ordinary terms of a policy. (3) No. (4) Fifteen per cent. would not be too high a provision after destruction by fire. (5) A meeting on the site between two surveyors, one representing each party, and an umpire agreed upon by both, under a properly drawn submission to the arbitration of the umpire. If the umpire selected be a complete stranger, so much the better.

G. A. T. M.

Sketching.

SALISBURY.—PUGIN writes: "Is there a preparation by which pencil sketches may preserved? I am preparing sketches for t Pugin studentship, and think that in time th will become indistinct without some kind wash. Also, what size sketch block, general speaking, do you think suitable for this studen ship?"

There are several preparations for fixing cha coal and pencil drawings sold by the artist colourmen. The basis of the majority of the is spirits of wine and resin, and they are spraye on to the back of the drawing. If the drawin are not likely to be exposed to very rough usag a solution of gelatine made with warm wate into which the drawings are to be dipped dow wards and set to dry the other way up, generally effective and inexpensive. With r gard to the size of the block for Pugin studen ship sketches it depends much upon the subjec where detail is to be rendered a larger size bein required than for sketches intended to sho merely the general design and mass of the buil ing, or with its surroundings from a distanc We recommend for full-sized details and profile of mouldings separate sheets of drawing pape as very large blocks are rather expensive. F detailed and general sketches, a block abou 14in. by 10in. would be a useful size.

Sketching Tour round East Coast.

LONDON, W.—H. S. writes: "I propose goin for a fortnight's cycling tour round the Eas coast about as far as Yarmouth. Kindly mentio a route with places of architectural interest where I could sketch and take some measurements."

Both Essex, Suffolk and Norfolk are very ric in old buildings, and we cannot spare space t give a detailed list on any route. The following, however, would be found a good route; i addition to the places we mention, many villag churches and interesting old domestic building will be passed on the way: Barking (the ol nunnery the special interest), Waltham Abbey Ongar, Margaretting (the church has a massiv oak porch and some old stained glass), Beleig Abbey, Colchester, St. Osyth (priory and church) Hadleigh, Ipswich, Woodbridge, Butley Priory Orford (a fine old Norman keep in the castl here), Dunwich (the monastery), and Grea Yarmouth (the parish church the chief interes architecturally).

Measuring Land.

LANCASHIRE.—LAND writes: "How man square yards are contained in 3 roods 3 perches 'customary measure'? Can you give me th full table, 'customary measure'?"

Formerly, by custom, the perch (which forme the unit of measurement generally) varied i different parts of the country, and consequentl the acre varied also. This state of things is no happily dying out, and rarely nowadays doe the surveyor meet the old "customary" measure in England. The old Lancashire lineal perc contained 21ft., and therefore 21ft. + 21ft. = 441 sq. ft. or 49 sq. yds. constituted the area o the square perch. There are, consequently 7,840 imperial square yards in a "Lancashire" or "long" acre (the "Irish" acre is the same) and the area in imperial square yards of the plo mentioned in the question may be thus arrive at:—

3 roods 3 perches = 123 perches.
123 × 49 = 6,027 sq. yds.

If the table asked for be written out fully, i will read:—

"*Lancashire Square Measure.*"

144 sq. in. = 1 sq. ft.
9 sq. ft. = 1 sq. yd.
49 sq. yd. = 1 sq. pole or perch.

$$\left.\begin{array}{r}\text{40 sq. poles}\\ \text{or 1,960 sq. yds.}\end{array}\right\} = \text{1 sq. rood.}$$

$$\left.\begin{array}{r}\text{4 sq. roods}\\ \text{or 7,840 sq. yds.}\end{array}\right\} = \text{1 sq. acre.}$$

If must not, however, be presumed that "customary" measure everywhere means 7,840 sq. yds per acre. This varies according to locality from 2,308¾ for Leicestershire (though I believe thi measure is quite dead, as, though born in tha county, I have never met it) to 10,240 sq. yds in Cheshire. G. S. M.

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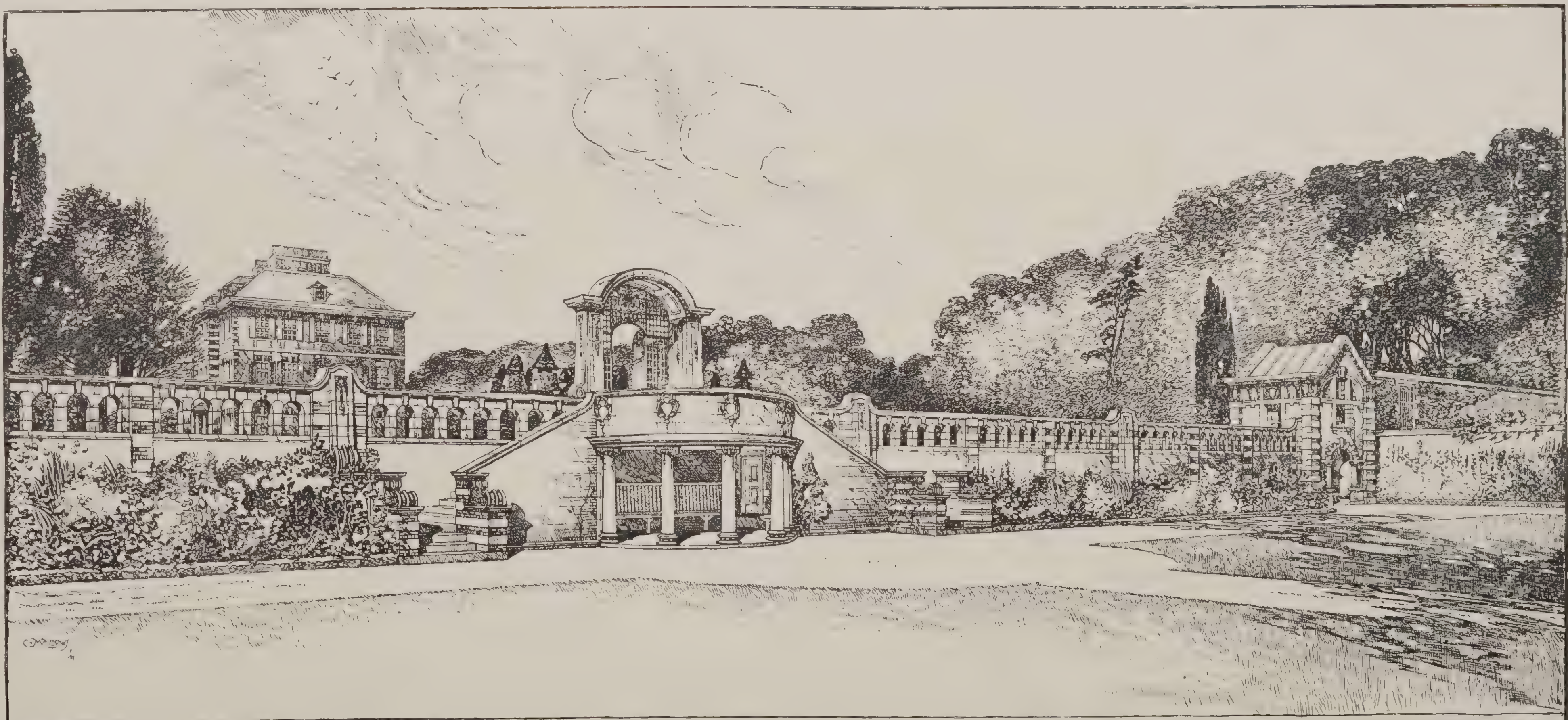

TERRACE & SVMMER HOVSES D'ALHAM HALL SVFFOLK FOR SIR ROBERT AFFLECK BART. T.H. MAWSON. C.E. MALLOWS & GROCOCK ARCHITECTS

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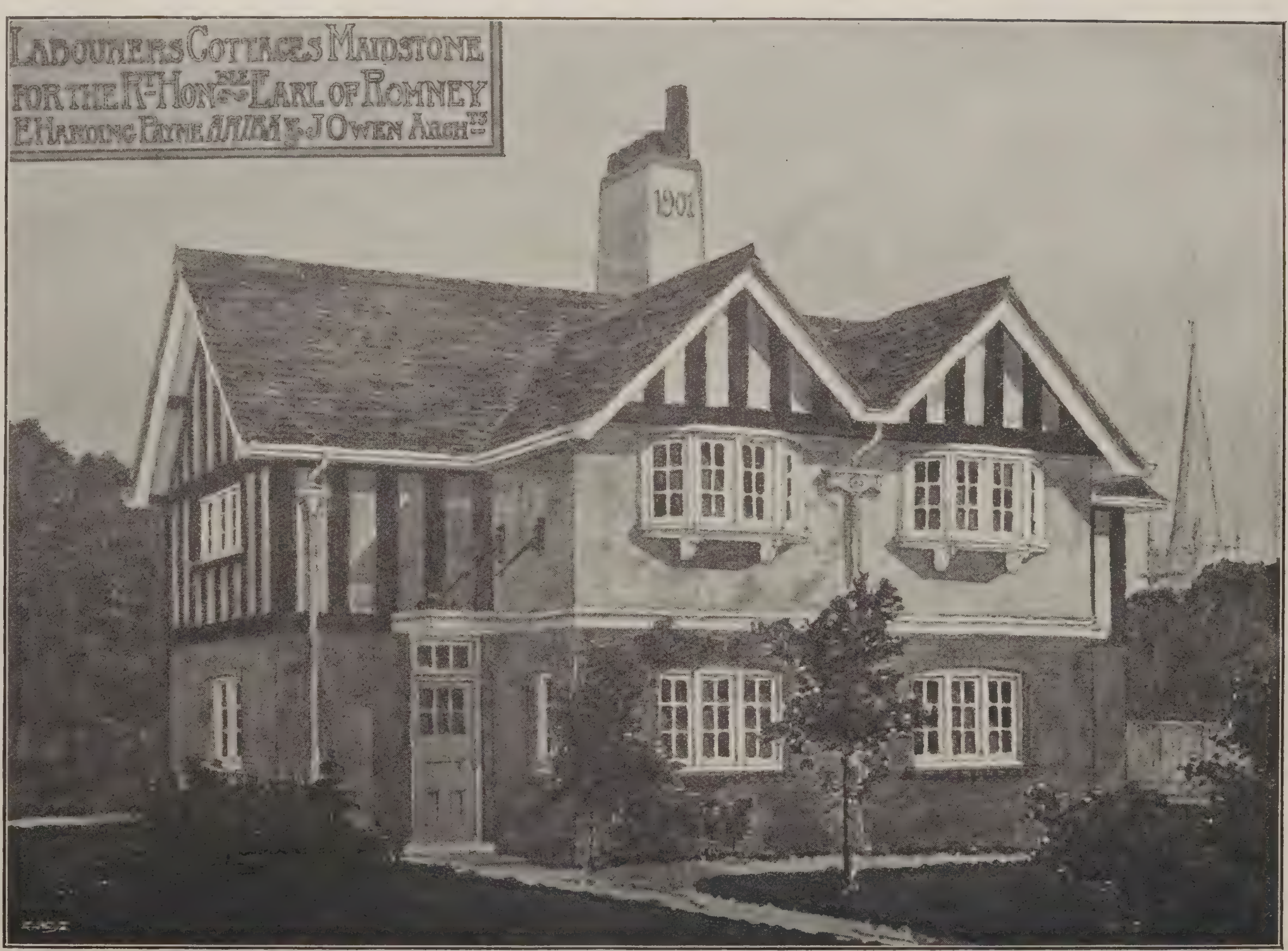
LABOURERS COTTAGES MAIDSTONE
FOR THE RT HON BLE EARL OF ROMNEY
E HARDING PAYNE A.R.I.B.A. & J OWEN ARCHTS
1901

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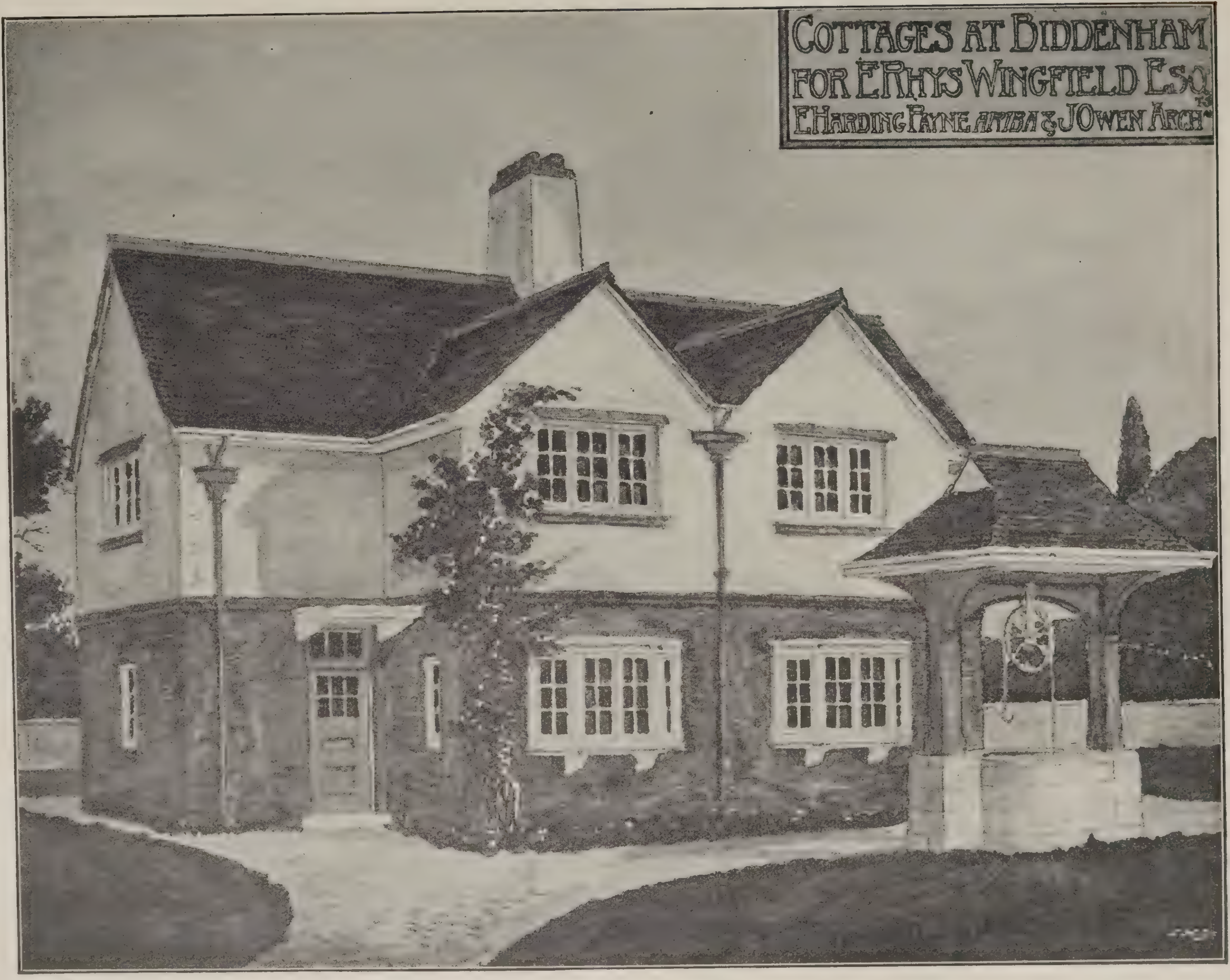
COTTAGES AT BIDDENHAM
FOR E RHYS WINGFIELD ESQ.
E HARDING PAYNE A.R.I.B.A. & J OWEN ARCHTS

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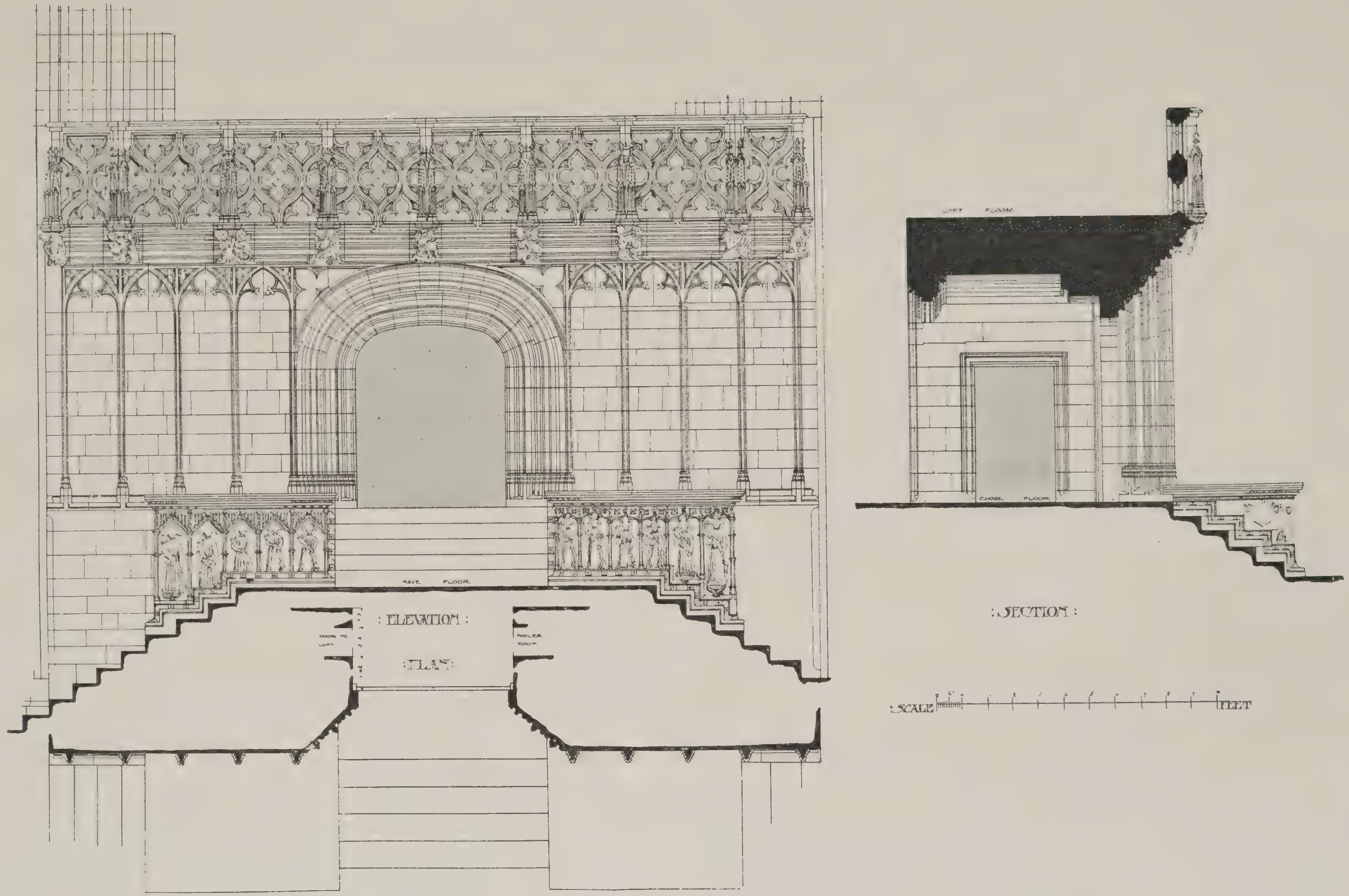

THE ROOD SCREEN, GLASGOW CATHEDRAL. Measured and Drawn by A. WAGSTAFF.

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Bricks and Mortar.

APHORISM FOR THE WEEK.

Mediævalism is as dead as a fern-leaf in a lump of coal . . . ; other developments are shaping in the world, in which Gothic architecture and its associations have no place.—THOMAS HARDY : "Jude the Obscure."

Our Plates. THE cottages at Gould Court, Maidstone, by Messrs. E. Harding Payne, A.R.I.B.A., and John Owen are to be erected for the Right Hon. Earl of Romney. The price for the work, with certain modifications (but including drainage and fencing), is £428. Messrs. Cook, Pearce & Sons, of Maidstone, are the contractors. The plan is given on p. 482.—The cottages at Biddenham, near Bedford, were for the late Mr. E. Rhys Wingfield, and are about to be erected at a cost of £450. The plan is given on p. 483 of this issue.—Mr. C. E. Mallows's drawing of the terrace and summer-house at Dalham Hall, Suffolk, is in this year's Royal Academy Exhibition.

Drawing with Microbes. IN one of his lectures to the students of the Royal Academy Professor Herkomer recommended enamel painting to the artist of middle age who was, perhaps, a trifle weary of working in oils and wanted the inspiration of a new medium. But the "Lancet" offers the painter in search of a new medium something much more inciting than enamel—nothing less than the production of colour on canvas by micro-organisms. Very beautiful colours, we are told, in almost all shades, can be obtained by the cultivation in a suitable environment of chromogenic bacteria. Carefully selected chromogenic organisms need only to be cultivated on the proper parts of the canvas to bring forth a picture "with all the colouring that the colourman's art can produce." Artists are assured that "excellent seascapes could be produced by the selection of organisms producing yellow and blue colours respectively, a blend of colour suitable perhaps also for a moonlight scene, and the purple producing bacteria might be enlisted for the representation of dawn. The "Lancet" gives many useful hints to the worker in the new medium. If, for example, he wants to paint a sunset, there is nothing better than the *micrococcus prodigiosus* for the purpose, while for the representation of a field of corn the *micrococcus auranticus* is all that can be desired. If, however, the cornfield painter is particularly fastidious he can can try the *sarcinae*—those which produce rich yellow colours—in place of the *micrococcus auranticus*. The "Lancet" concludes its article on the new impressionism by suggesting with apparent gravity "that a picture will some day be produced in which the colours portrayed on the canvas will be the products of bacteria provided with a suitable pabulum."

The Late Mr. Yeoville Thomason. MR. HENRY YEOVILLE THOMASON, of 9, Observatory Gardens, Campden Hill, Kensington, died recently. Mr. Thomason was for the greater portion of his life intimately connected with Birmingham and was one of the foremost architects practising there. He was born at Edinburgh in 1826, and after being educated at a private school was articled to the late Mr. Charles Edge, architect of Bennett's Hill, and within a short period after the completion of his articles he became manager of the architectural department in the Birmingham Borough Surveyor's office under the late Mr. Pigott Smith. He, however, soon found greater scope for his talents in private work, and we believe one of his first notable commissions was the designing of the Hebrew Synagogue, Singer's Hill. His next important work was in connection with Francis Road Chapel, Edgbaston, and in this he showed a departure from convention by adopting the Gothic style—a proceeding which, it has been said, was not to the liking of the older generation of Nonconformists of those days, though the example has been frequently copied since. Another building which added to Mr. Thomason's reputation as an architect was the Union Club premises in Colmore Row. The plans for St. Asaph's Church and the restoration of Harborne Church were other undertakings entrusted to him, and he designed the "Birmingham Daily Post" office. His greatest work, however, was the Council House, which, however, is now rapidly becoming too small for the accommodation of the many departments of municipal work. His plans were selected as the result of a competition. When the Art Gallery and Gas Offices came to be added Mr. Thomason again had the planning and supervision of the work, and it was carried out in a manner worthy of the original building. Among the more recent buildings which he designed may be mentioned the Jaffray Suburban Hospital.

Queen Victoria Memorial. AT a meeting of the Council of the Society of Architects held on Thursday, April 25th, 1901, the following resolution was unanimously passed : "That in the opinion of the Council of the Society of Architects (founded 1884) all architects being British subjects should be granted the privilege of showing their loyalty by submitting designs for the National Memorial to her late Majesty Queen Victoria under conditions which should put those resident in distant parts of the Empire as nearly as possible on an equal footing with those living in England, and that a copy of this resolution should be sent to Viscount Esher, with the request that it be laid before his Majesty the King." In reply the following has been received from Lord Esher : "I have now the honour to inform you that, in accordance with the request contained therein, this resolution has been laid before the executive committee appointed by his Majesty the King. I am instructed to say that the committee see no reason to depart from their original decision, taken after careful and due deliberation."

The late Mr. R. Lofthouse. WE regret to announce the death of Mr. Roger Lofthouse, head of the firm of Messrs. R. Lofthouse & Sons, architects, of Albert Road, Middlesbrough, which occurred at his residence, The Croft, Linthorpe, recently. Mr. Lofthouse was a native of Wensleydale, where he was born in 1846, and received his education at a private school there and at Dr. Greaves' Academy in Middlesbrough. After being for some years with a local firm of architects and builders, he commenced business in Middlesbrough as an architect, and during the past quarter of a century gradually built up a large and valuable professional practice in the town and the North Riding. He was a Fellow of the Surveyors' Institute, an ecclesiastical surveyor for the diocese of York, and a valuer under the Finance Act to the Middlesbrough County Council. He was an ex-president of the Cleveland Naturalists' Field Club, of which he was one of the founders, and a member of the Yorkshire Archæological Society. Mr. Lofthouse was at one time a keen artist, and besides painting considerably in oils did a good deal of etching and lithographic work and made a series of drawings for the late Canon Atkinson's "History of Cleveland." In 1895 and 1897 he took his sons, Mr. T. A. Lofthouse and Mr. J. A. Lofthouse, both Associates of the Royal Institute of British Architects, into partnership with him.

Lord Leighton's House. A PUBLIC meeting was held in the Town Hall, Kensington, recently in support of the movement for the permanent maintenance for the borough and the nation of the house and grounds of the late Lord Leighton, with the collection of his drawings and sketches now therein. The Bishop of London moved the first resolution as follows : "That this meeting warmly supports the movement which has been inaugurated having for its object the dedication to the public of the house and grounds of the late Lord Leighton, and the collection of art treasures secured therein, to be a memorial to that great artist, and as a public gallery, museum, and centre of art work for the borough of Kensington." He said the Bishop of London was concerned with all that made for the happiness of Londoners, and therefore it was his duty to support any movement the object of which was to brighten the lives of the people. A long experience among the poorer classes had convinced him that they appreciated beauty of sound and beauty of form. Another reason why he gave his cordial support to the scheme was that the house would be the centre of art teaching for the population of Kensington. Sir William Richmond, R.A., in seconding the motion, said it did not fall to the lot of every generation to commemorate a great artist, a great man also, in so fitting a manner as that in which it was proposed to do in this instance. Leighton was a great artist ; he was also a great man, a man of whom not only his country but foreign nations had a right to be proud. Facile and brilliant, Leighton was never satisfied with his achievements ; his modesty was as conspicuous as his activity was untiring ; the power of taking pains was a gift cultivated in him to perfection. If one word more than another applied to Leighton it was nobility. His was a name which engendered in many enthusiasm in all respects. The intention of the scheme was that the house should be maintained for the nation as a centre of all that was most beautiful and elevating in art, music and letters, and an intellectual possession accessible for the poor as well as for the rich. That intention was in complete harmony with Leighton's whole life. The motion was agreed to. Earl Percy, M.P., moved : "That representations be made to the borough council of Kensington, inviting their co-operation in securing the success of the movement, and suggesting that the council might fitly commemorate their inaugural year of office by accepting the gift of this property and permanently maintaining it under their statutory powers as an institution for the encouragement of the study of literature, science and art in the borough." He said the cost of maintaining Leighton House, if it were taken over, would not amount to more than a farthing rate, in addition to the library rate, once every three years. If the borough council could see its way to carry out the wishes of the meeting, Leighton House in their possession would be not merely a school of art, a museum of priceless curiosities, a concert or a lecture-hall ; it would be a perpetual memorial of one who was a great citizen as well as a great artist, and a perpetual record of the pride and reverence which Kensington felt for one of the best and most distinguished of her sons. Mr. Lionel Cust seconded the motion, which was unanimously agreed to.

The Alfred Millenary Exhibition. A SMALL exhibition is arranged at the British Museum, containing all the antiquarian treasures that the national collection can boast as having a relation to the great English King Alfred. The one precious relic, the Alfred Jewel, that tradition and pious belief hold to have been his, is preserved in the Ashmolean Museum at Oxford, and is here only represented by a careful facsimile. Professor Earle, of Oxford, has recently printed an elaborate monograph on this precious relic. A note of another kind is struck by the finger rings of Ethelwulf, King of Wessex, and of Ethelswitha, Queen of Mercia, the father and sister of Alfred. Fortunately in both of these the craftsman has added the one needful thing, the words "Rex" and "Regina" following the names. Compared with the Alfred Jewel, the charms of these two historical objects are small ; they have no brilliant colouring save that of the rich gold of which they are made, and in design they are simple and modest. Such artistic features as they possess, however, are pleasing, and show such a skill in the gold work and in inlaying of the niello that adorns it as to make it a matter of question whether they, equally with the Alfred Jewel, are not the productions of Roman rather than English smiths. In pure charm of colour, as well as of design, the three enamelled brooches shown beside the rings are far to be preferred to them. It must not be assumed, however, that all the objects in the exhibition were once royal property, nor, indeed, that they are of only one class. A silver spoon and fork found in Wiltshire, with coins of the ninth century, is shown ; while a piece of lead on which the Saxon moneyer Ealdulf has struck a proof of a penny of Alfred forms an appropriate introduction to the series of Saxon coins that have been selected from the cabinets of the coin department.

EXAMINATIONS FOR CLERKS OF WORKS AND BUILDERS' FOREMEN.

MODEL ANSWERS TO THE QUESTIONS SET.

By GEORGE ELLIS, Medallist.

THESE examinations in carpentry and joinery are held annually in June by the Worshipful Company of Carpenters at their hall in London Wall. Certificates of competency signed by the master, and sealed with the company's seal, are awarded, as are also gold, silver and bronze medals to the three best candidates.

The examinations are intended to be suitable for shop and outdoor foremen in carpentry and joinery, and clerks of works and others who have to deal with the construction of buildings. The examination board comprises the following: Professor T. Roger Smith, F.R.I.B.A., Mr. John Slater, B.A., F.R.I.B.A., Mr. John Willson (Warden of the Company), Mr. James Bartlett, M.S.A. (Assistant Lecturer at King's College), Mr. S. Barter (Examiner City and Guilds Institute), Mr. Stanton William Preston; and the following gentlemen are annually invited to join the board: The President of the Royal Institute of British Architects, the President of the Institution of Civil Engineers, the President of the Architectural Association, the President of the Institute of Builders, the President of the Clerk of Works Association, and Sir Philip Magnus, of the City and Guilds Institute. Each candidate must be twenty-one years of age or upwards on the first day fixed for the examination. He must have paid an entrance fee of five shillings, and must have given notice in conformity with the regulations stated herein. He must have passed at least in the ordinary or pass grade of the examination in carpentry and joinery conducted by the City and Guilds of London Institute, or the Science and Art Department's Examination in Building Construction, which examinations the company accepts. Exception may be made in favour of candidates over thirty years of age. The examination is such as to test the practical skill of the candidates as workmen, their know- of materials and their acquaintance with the subject. It will be partly by written answers and drawings of a practical character, partly by work done at the company's workshops in the presence of moderators and partly oral. Candidates who have already gained a second-class certificate and present themselves to obtain a first-class one will be allowed similar marks for the practical work to those they have previously obtained, and need not go through it again. No candidate who has obtained a medal will be allowed to sit for this examination again, and a candidate who has obtained a first-class certificate will only be allowed to sit once more. The subjects for examination comprise the following :—

1. The nature and properties of timber, its decay and preservation.
2. Timber framing.
3. Joiners' work.
4. Shoring.
5. Temporary structures.
6. Centering.
7. Scaffolding, tackle and hoistings.
8. Timberwork in excavations and staging.
9. Describing at sight actual specimens of various sorts of wood, and defects in timbers, which are to be placed before the candidate.

[Full particulars of the examinations may be had on application to the clerk to the company.]

Question 1, Division III. (1893). *Make a detail drawing to scale of $\frac{1}{8}$ full size of the head, meeting rail, transome, sill, and any other parts you please of the casement frame and sash, shown in drawing No. 1 on the lithographed sheet supplied you.* (30 marks.)

For a solution to this question see Figs. 1 and 2, which are respectively broken vertical and horizontal sections through a French casement frame, with inward opening sashes and fanlights. Fig. 2 has been arranged to show on the one side the hanging jamb of a double light frame, and on the other side the striking jamb of a single light frame; whilst the central part shows the meeting stiles of a pair of casements finished with a hook joint and prepared to receive an espagnolette bolt. A hinged metal water bar closes the joint at the bottom of the casement.

Question 5, Division IV. (1896). *The side wall of a house 30ft. long 27ft. high to the eaves has shown serious signs of failing through faulty foundations. Give drawings to $\frac{1}{4}$in. scale, showing the raking shores, needling up, &c., requisite to rebuild the lower part, to a height of 10ft., the top being sound. Two window openings on the first floor, each 3ft. by 5ft. high, equidistant from centre pier, which is 4ft. wide. The wall 18in. thick to ground floor, the rest 14in.; height of stories in clear, ground 10ft.; first floor, 9ft. (no basement). Joists bed in the wall.* (50 marks).

Figs. 3 and 4 are a section and elevation of the wall meeting the required conditions. Three sets of raking shores are required, one against each flank wall and one against the pier. The whole of the under part of the wall having to be taken out and rebuilt, at least five needles with pairs of dead shores will be required to support the upper portion meanwhile. The weight of the floors, &c., is supported by independent strutting, which transfers the load to the lower plates, carrying the inner dead shores. Assuming the rupture of the foundations to be due to a subsidence of the subsoil, it would not be wise to lay the inside plate parallel with the foundation trench; short transverse baulks should be used as shown. The dotted lines in Fig. 4 indicate the interior strutting.

Question 2, Division VIII. (1900). *A warehouse floor is carried on iron girders 12ft. apart centre to centre. Sketch the wooden joisting of one bay, showing the plates, the method of supporting them on the girders, and the notching of the joists over them; also show the trimming for a trap-door 6ft. square in the clear in the middle of the bay. Also sketch the principal joints and connection.* (50 marks).

For solution see Figs. 5, 6, 7, 8. Fig. 6 is a part plan of one bay showing 11in. by 3in. joists notched between 12in. by 6in. R.I. girders, and resting on 4in. by 3in. plates bolted to the girders. The trimmers to the opening are 11in. by 4in.; on one side 6in. by $1\frac{1}{2}$in. floor battens are shown, on the other the naked flooring, with a part in horizontal section at A. The trapdoor is made in two leaves of 6in. by 2in. battens, resting 1in. at each end on the trimmers, and on a 11in. by 3in. movable bar in the middle, the latter being half-notched into the trimming joists for $\frac{1}{2}$in. at each end. Fig. 5 is a section on B B; Fig. 7 an isometric sketch at the centre of the joint between trimmer and trimming joist; Fig. 8 a sketch showing the method of connecting the plates and joists to the girder.

Question 1, Division IX. (1899). *Is baulk timber preferable to plank for general use? and if so, why?* (25 marks.)

Baulk or whole timber is preferable to plank or cut timber for carpentry and all constructive purposes, but not generally for joinery work, because, in the first instance, a maximum of strength with a minimum of scantling is required, and this can only be obtained when the majority of the fibres of the wood run continuously throughout the baulk, as in unsawn timber; in the second instance, appearance and

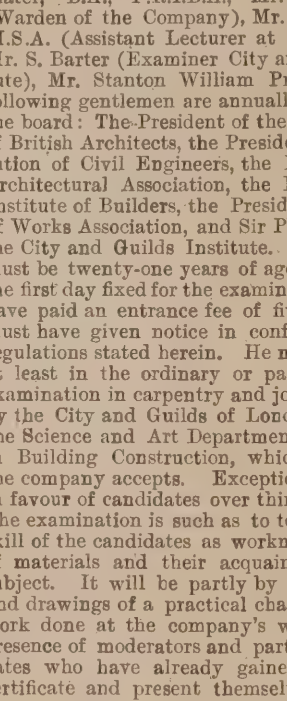


FIG. 1. VERTICAL SECTION.

FIG 2. HORIZONTAL SECTION.

SOLUTION TO QUES. 1, DIV. 3.

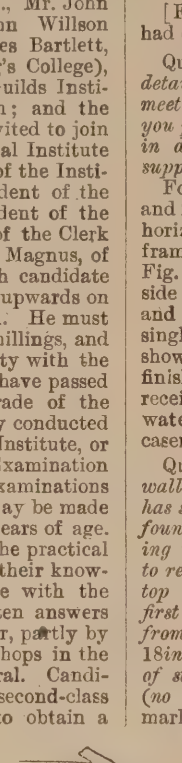


FIG. 3. SECTION.

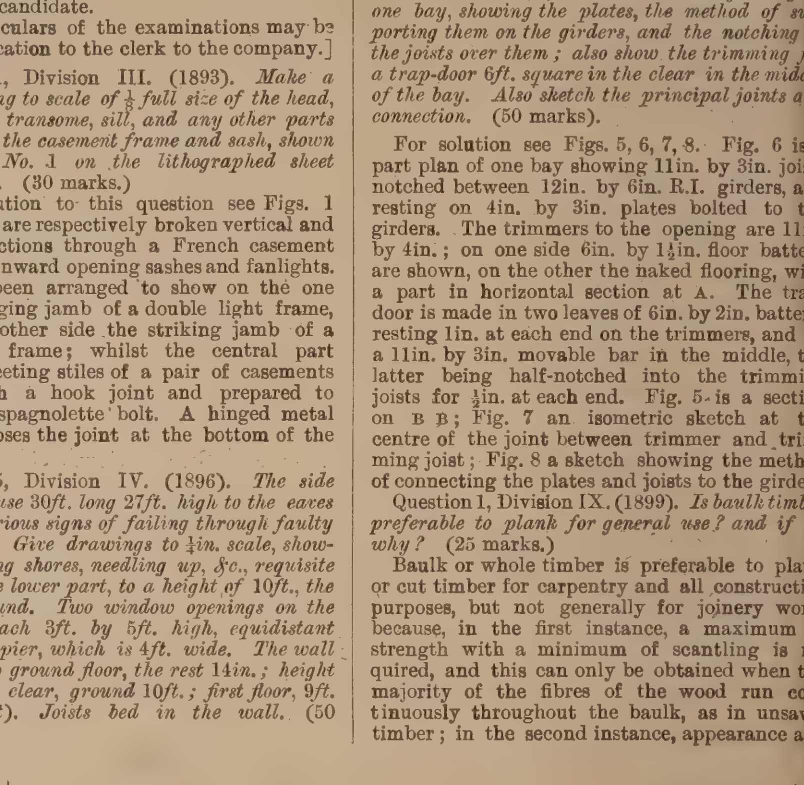


FIG. 4, ELEVATION.

SOLUTION TO QUESTION 5, DIVISION 4.

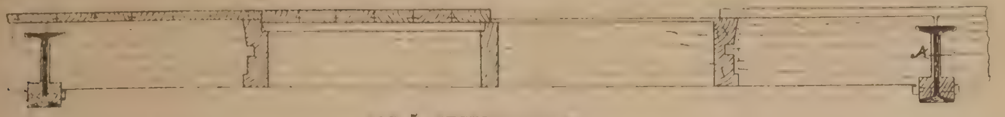


FIG 5. SECTION ON BB.

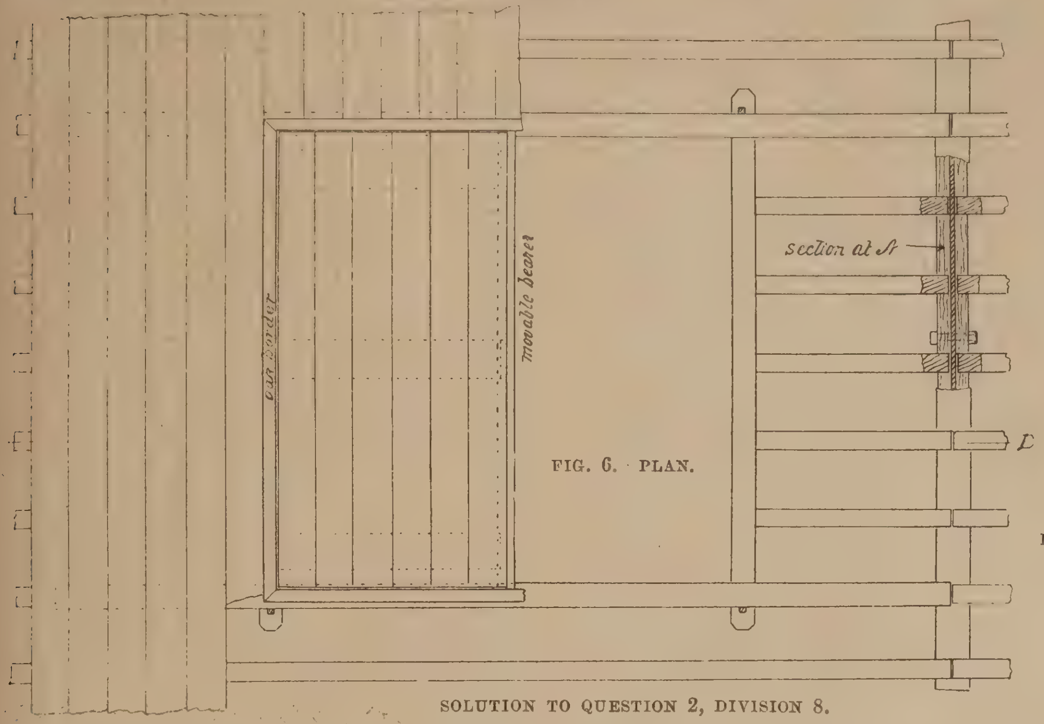


FIG. 6. PLAN.

SOLUTION TO QUESTION 2, DIVISION 8.

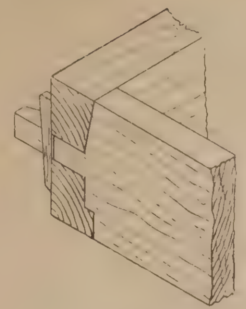


FIG. 7. SKETCH OF JOINT IN TRIMMER.

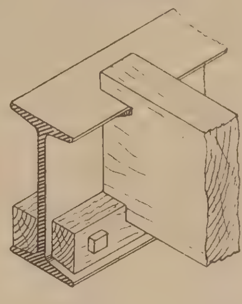


FIG. 8. SKETCH OF CONNECTION OF JOIST AND PLATES TO GIRDER.

ueness of section are of more importance than rength, consequently, purpose cut timber is ore suitable.

Question 4, Division IX. (1895). *Does timber rink endways of the grain? If so, name any mbers that you know that do so, giving par- culars of qualities and place of growth.* 35 marks.)

The great majority of timbers do not shrink ppreciably in the direction of the grain, but here are a few exceptions; amongst the more miliar woods may be mentioned English Elm, auri Pine and Basswood. The shrinkage of e first is probably more apparent than real in e direction of the length of the fibres. This ood, being particularly twisted or cross grained, as seldom its fibres running parallel with the rface of a cut plank, and a shortening of the lank would probably be due to the lateral rinkage of some of the crossing fibres. Kauri r Cowrie) pine, a native of New Zealand, is a ugh leathery wood of somewhat loose texture, e tree growing to immense size both in height nd girth. It is a peculiarity of this wood that it rinks but very slightly in width or transversely, hilst its end shrinkage is very persistent; even fter two years of drying a drawer front fitted uite tight one day will fall cut easily the next. he American tulip tree wood, commonly known s basswood, a native of the Middle States of orth America, a spongy, soft but tough wood, also subject to slight shrinkage in the direc- ion of its length.

Question 1, Division I. (1898). *Explain the llowing terms used in connection with strains wood: Compression, tension, transverse strain, eutral axis, fatigue of material, elasticity, ermanent set.* (25 marks.)

"Compressive stress" is the force tending to ush the fibres of wood in the direction of their ngth. "Tensile stress," the force tending to pture them by pulling asunder. "Transverse ress" is a force applied either obliquely or at ght angles to the fibres, and tending to break em across. "A strain" is the change of form roduced by the stress, and would be termed in cordance with the direction of the force; for stance, a transverse strain in a beam would be roduced by overloading it in the middle. The neutral axis" is the imaginary layer near the iddle of a beam carrying a load where the resses change their direction; the fibres in e upper part being strained compressively, d those in the lower part tensionally, there a part where the stresses counteract each other and the effect is nil. This part is termed the neutral axis. "Fatigue of material" is the deterioration or weakening which members of structures suffer under long continued loading or vibration. "Elasticity" is the property which wood has of returning to its original form after being strained. "Permanent set" is a term applied to any alteration in the shape of a member of a structure when it has been strained beyond its elastic limit, and does not return to its original shape after the stress is removed. It is then said to have acquired "a permanent set."

New Patents.

These patents are open to opposition until August 26th.

1900.—**Mosaic, Tile, &c., Paving.**—14,697. G. F. THOMSON, Isebank, Wellingborough. The flooring or paving is constructed in sections consisting of a number of blocks, tiles, &c., mounted on a slab of artificial stone by means of a key.

Artificial Stone.—14,778. A. H. CROIZIER and A. E. THOMINE, 9, Rue Mogador, Paris. Artificial bricks or stones are made by adding clay or loam earth, in its natural state or in a dry pulverulent condition, to fat lime with an addition, or not, of sand, the whole well mixed in appropriate proportions, and then moulded in a hydraulic press, and finally subjected to the combined action of heat and pressure in the midst of steam.

Hoists and Elevators—15,136. C. WUST, Seebach, near Zürich, Switzerland. Instead of the usual method of causing the ropes to move up and down in the well, the ropes are attached to the top and the cage wound up and lowered on the ropes by means of an electric motor attached to the cage.

Concrete Floors.—15,388. M. KOENEN, 129-130, Potsdamerstrasse, Berlin. In a concrete floor having strengthening ribs in which are embedded iron tie rods, these ribs are supported along their whole length on wooden beams; the tie rods are also made to serve as hangers for supporting the wooden beams

1901.—**Windows.**—816. J. M. BYRENS, G. E. DREW and T. R. PEARSON, Bank of British Columbia Building, Columbia Street, New Westminster, British Columbia, Canada. To prevent draughts, keep out wet or dust and prevent the sashes from rattling, a strip having a right-angled side is introduced along that portion of the pulley stiles, the head frame and the side covered by the sash frames, and lies in a rabbeted groove. The invention is also to provide against the window being displaced from its proper position, and allows it to slide up or down in a convenient manner.

Picks, Hammers, &c.—4,318. J. SHONE, 96, New Road, Tuebrook, Liverpool. The working end or point is formed separately from the main body of the hammer or pick, socketed into the other end, and locked or held in so as to enable it to be removed if required.

Manufacture of Portland Cement.—10,297. C. VON FORELL, Giessen, Germany. A process for making Portland cement from blast furnace slag, which consists in the slag being granulated in water, forming a spongy loose mass, being heated to fusing or clinkering point with its natural proportion of lime (about 50 per cent.), or if necessary being brought up to the required proportion by the addition of lime, then the fused product being cooled down and ground.

The following specifications were published on Saturday last, and are open to opposition until September 3rd. A summary of the more important of them will be given next week.

1900.—11,452, BULMER, soldering irons. 11,653, EWING, joints of earthenware or other pipes. 12,124, SPENCE, SPENCE, SPENCE & ROYLEY, treatment of sewage sludge. 12,418, THACKRAY & THACKRAY, road scarifiers. 13,495, LANCASTER (*Perfection Window Hinge Co.*), means for enabling sash windows to be cleaned from the inside. 13,534, LAKE (*Ogden & Ill*), door-checking and closing apparatus. 13,931, BROWN, appliance to control downdraughts and smoke, the like as an exhaust ventilator. 13,947, BIRCH, holders for incandescent gas mantles. 14,253, COPE, means of attaching door knobs to their spindles. 14,738, SAUNDERS, heat radiators. 15,187, BROPHY, cocks or valves. 15,245, EVERARD, portable apparatus for supporting lifting tackle. 15,352, ROUSE, concrete for building, paving and other purposes. 15,390, LILLIE, domestic hearths. 18,350, LAKE (firm of *Fellner & Ziegler*), cement kilns. 22,088, GLUTH, incandescent gas burners.

1901.—1,300, MALTBY & RATCLIFFE, jointing of water, gas and other mains. 3,824, AMES, clay pipes or tubes with internal partitions. 8,859, GERLING, safety appliances for hoists, lifts, &c. 9,397, HELD, spring-hinges. 9,518, KLOTZ & GRUNDMANN, pivot hinges for cupboard doors. 10,725, WISE (*Klinger*), acetylene gas generators. 10,892, Lindqvist, pipe cutters. 10,929, Marsden & Anderson, water-steam or other taps. 10,944, Bobe & Bobe, road scarifiers. 10,946, Perron, rules. 11,057, Price, protractors. 11,060, Müller, seats for closets.

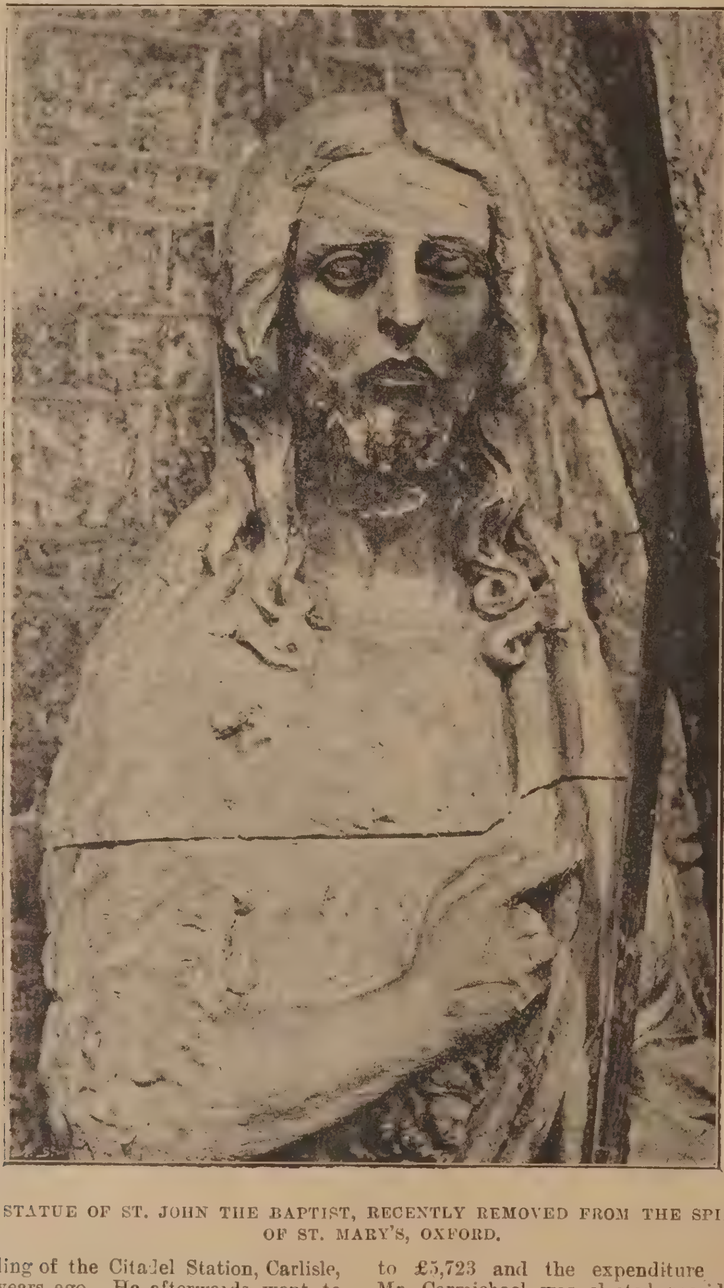
Builders' Notes.

The First Granite ever sent from the United States to Europe will be shipped to Scotland next month from Stonington, Maine. The American quarry companies say they can sell Main granite in Glasgow, Aberdeen or Liverpool at 4s. per foot, whereas Scotch granite costs about 9s.

Mr. John Westmorland, of Southport, owner of the Imperial Hotel, Liverpool, the Grand Hotel, Whitehaven, and the Great Central Hotel, Carlisle, died recently. He was a self-made man. The son of an innkeeper at Brampton, Cumberland, he was born about seventy-five years ago, and became apprenticed to a joiner. He worked at the building of the Citadel Station, Carlisle, over fifty years ago. He afterwards went to Liverpool, where he commenced as a builder, and was fortunate in speculations in property he sold to the railway company. He bought the Imperial Hotel, and some fifteen years ago built the Great Central Hotel at Carlisle. He also purchased the Grand Hotel at Whitehaven, and owned much property at Huyton.

Mr. John Cowley, of Arnold Street, Rugby, died recently at the age of seventy-four years. Mr. Cowley came of a well-known and respected Northamptonshire family many years domiciled at Crick, he being born, however, in the village of Yelvertoft. When a young man Mr. Cowley commenced business as a builder in Rugby. The work on the extensive property of the late Messrs. Benn was almost exclusively done by him; and as a setter of gas retorts and ranges Mr. Cowley possessed a reputation in the neighbourhood.

The Builders' Benevolent Institution held its annual meeting last week under the presidency of Mr. J. T. Bolding. The report stated that, notwithstanding the calls which had been made on the charitable public, the institution had not suffered to such an extent as might have been expected, though it was a matter of regret that there had been a falling-off in the annual subscriptions. It was expected, however, that in the future the number of candidates would be greater owing to the alteration of the rule reducing the age-limit from 60 to 55. The balance-sheet showed that the receipts, including the balance of £833 brought forward, amounted to £5,723 and the expenditure to £1,813. Mr. Carmichael was elected president for the ensuing year.



STATUE OF ST. JOHN THE BAPTIST, RECENTLY REMOVED FROM THE SPIRE OF ST. MARY'S, OXFORD.

The two Statues illustrated on this and the opposite page were unfortunately removed about four years ago from the spire of St. Mary-the-Virgin, Oxford, when the church was restored by Mr. G. T. Jackson, R.A. These old Gothic sculptures are extremely fine examples; and though we regret their removal from their proper position, they have happily been preserved in the old Congregation House.

EXPRESSION IN ARCHITECTURE.

By HENRY RUTGERS MARSHALL.

ALL who are interested in architectural practice, either directly or indirectly, are familiar with a doctrine which has much currency in our day that buildings must express their purpose and their structural qualities in their design if they are to be looked upon as works of architecture. Not a few readers, indeed, who have been influenced perchance by Ruskin's fascinating writings, may have come to look upon this dogma as a recognised cardinal principle of the art of architecture.

But if one has thus accepted this dogma, and in connection therewith has taken the trouble to study with care the work of contemporaneous builders, he can scarcely have avoided the somewhat depressing conclusion that architecture is for us a lost art. Indeed, one may go much further than this; for a student who has followed with critical bent the historical development of what is usually called architecture in the past, and who has at the same time kept this dogma always in mind, must surely have found himself forced to the position, which is apparently held by some of our most prominent architectural critics, that architecture ceased to exist at least 3,000 years B.C., and long before any buildings were constructed of which any examples are now extant.

It is apparent from the words above written that the validity of the dogma above referred to is to be questioned in what follows. Nevertheless the reader must not look for an argument to prove it utterly valueless, rather will he find reason, after all is said, to trust to it in a way, as the architect will find reason to work by it; but this not because the dogma will appear in the end to be true in itself, but because it will be seen to veil a real truth. What this real truth is we will consider briefly at the start, that we may be the better prepared to speak of special examples later on.

We most easily grasp the truth which is back of and veiled by this dogma if we first come to realise that it is only a special adaptation of what has long been held to be a general æsthetic principle. It is but an interpretation of the general dogma of artistic realism in terms of the art of which we speak specially in this article, and to this general dogma of realism we may well direct our attention for a moment, before considering its special architectural adaptation.

This general dogma of realism may be stated thus: "Fine art is the expression of the true essence, of the real nature, of the subject presented by the artist." This is a dogma with which we are all made reasonably familiar by the teachings of the literary realists of the day—of writers like Zola, for instance, and Howells; and it is a dogma that is comparatively easy to uphold so long as we forget, what we should never forget, that literature is only one form of artistic expression co-ordinate with sculpture, painting, music and architecture. But when we are asked to broaden the application of the dogma to all the arts we at once see that it cannot be upheld in its original form; that it must be qualified, or limited or restated if it is to appear in any way applicable to all the fine arts.

It very obviously does not apply to modern music, for instance, without such qualification and re-statement; and if we but think of it, we find that the same is true in all the arts, to no two of which can this principle be applied with exactly the same significance. As we have already noted, the doctrine we are discussing is but a re-statement of this general dogma of realism to make it applicable to architecture, which we are specially considering in this article.

In order to make the supposititious principle thus applicable to the work of the artist-architect it has been assumed by its defenders that the true essence of architecture lies in its constructional and practical worth, and that true architecture, therefore, consists—first, in the expression, in building, of constructional values; and, secondly, in the suggestion, upon the exterior, of the uses which the hidden interior portions of buildings, as wholes, or in their pecial parts, are intended to subserve. But it is easy to show that both of these assumptions are entirely unwarranted.

To consider first the expression of structure. There can be no doubt, of course, that there is great æsthetic value in certain expressions of constructional function in the design of a building; but to claim that the expression of constructional function is *per se* necessarily æsthetic is certainly impossible; for were this true, all scientific engineering would have architectural value, which manifestly is not the case. Think, for instance, of the ugliness of the ordinary cantilever bridge in which constructional function is most clearly expressed. It is evident, in fact, without argument, that works of engineering must thrill us with their beauty if they are to lay claim to the possession of architectural values.

If we consider the second assumption of the architectural realist—the assumption that the suggestion of the interior uses of a building in the design of its exterior is of the essence of good architecture—we find it equally unsatisfactory.

It is true indeed that certain indications in the design of the facades of a building which lead one to appreciate the purposes for which the interior is to be used give satisfaction to the beholder, a satisfaction which often adds much to the æsthetic value of the whole mass; but to hold that the indication upon the exterior of the purposes for which the parts of a building are to be used is necessarily æsthetic is manifestly absurd; for such a principle in an ideal building would require the architect to indicate by appropriate forms or decorations the existence of menial offices which we not only wish to forget but which we actually must necessarily lose sight of if we are to enjoy the beauty of a building as a whole. Suppose, for instance, that we felt ourselves called upon to emphasise the kitchens and sculleries of our large mansions, say by decorating the windows with representations of pots and pans, as we use book-plates sometimes in the decorative leaded glass in our library windows.

It becomes evident, then, that while the uses of a building or of its parts may be expressed in the forms employed in the design, nevertheless this expression must be beautiful if it is to add to the æsthetic character of the structure. It is apparent that we have discovered no "royal road" to the attainment of beauty in architecture when we have grasped the realistic dogma we are now studying.

And if we examine the general dogma of realism of which this architectural dogma is an adaptation we at once see that it itself is utterly inadequate as a guide to the artist in any field; for it is very easy to show that, far from being given up to the expression of truth, all of the arts are deliberately concerned with, and are based upon the adoption of, conventions that are *per se* inherently untrue.

No art attempts what can, by any stretch of terms, be called a complete expression of truthfulness. In all the arts we find the artist working on the basis of conventionalised falsities; and this is true even in those arts which so clearly deal with realities that they are commonly designated as the imitative arts.

For instance, in sculpture—which is perhaps the most clearly imitative of all the arts—we find the artist expressing his genius by presenting to us beauty of form in all cases, whatever else he does, and in most cases he pictures for us living forms. But note that for this purpose he uses lifeless material; and that, in order to emphasise the beauty of form, he deliberately avoids expression of movement and colour; and in this he assumes unreal conventions. And mark how firmly this convention of unreality has been fastened upon us. Lessing, the reader will remember, makes it a canon of the criticism of sculpture that movement must not be portrayed. And as to colour, if anyone will take the trouble to speak of this subject with the greatest of sculptors, and the best informed, and most thoughtful of other artists, he will find how deeply rooted is the objection they have to coloured sculpture. It is true that some of the best sculptors have, from time to time, attempted to use colour in their works, but the colouring has seldom been realistic, and where the sculptor has reached any measure of success in such attempts it has been by adding to his work delicacy and charm rather than that special nobility of beauty which can be impressed upon us by sculpture as by no other art.

The painter goes even further than the sculptor in the direction we are considering by assuming as a necessary convention of his art an added falsity. Form he depicts as does the sculptor, and perspective and even movement, but all "in the flat," upon plane surfaces; and as the sculptor artist in general objects to the use of colour in his work, so the painter artist would look upon the painter who might model up his work before applying his brush as something of a trickster; although, mark you, in this modelling the so-called trickster would, in fact, be assuming less of falsity than the one who works in what we feel to be the legitimate field of the painter's art.

The mural painter has a special convention of his own which demands that the feeling of the flatness of the constructional surface, of its attachment to the wall itself as part and parcel of the building, must never be lost through all his work.

The painter of whom we have been speaking gains his effects by assuming many untruths, and endeavouring to reproduce merely true relations between colour masses; but the painter in monochrome, and the draughtsmen in black and white, assume still another falsity, and deal merely with relations of mass, and values of light, eliminating all colour. Some artists, in fact, have been most successful in expressing these relations of mass and light value by the deliberate use of colour which is impossible to the Nature they are interpreting.

Recall, for instance, the marvellous effects Turner obtained in his water-colours in this way. We may differ in our estimate of Turner if we judge him from his work in all; but no one can deny his great genius who has studied the large number of his water-colours gathered together in the National Gallery.

But beyond the unrealities in the art of painting thus far mentioned, note furthermore that the highest "key"—(if we may use the slang of the studio)—that the highest "key" at our command for use on canvas or wall surface is most untrue to Nature's "key." Furthermore, size and scale are also both deliberately falsified by the painter and draughtsman.

Perhaps the point we have been considering is made by reference to these two arts alone, but it may be well to go further and mention a few of the unreal conventions assumed by artists in other fields.

The dramatist deliberately assumes unreality of entourage, and untruth in all but the main suggestive relations of active expression. In connection with the development of the earliest drama men have discovered that the repeated story, the written word, will, to a great extent, produce the full effect of dramatic action, and they have thus again reduced the truthfulness of expression by describing action instead of acting themselves. The poets have gone still further and have added other conventional unrealities, namely, those of rhyme and rhythm. We have thus in poetry no real expressions of real activity; in their place we have mere verbal symbols which lead us to imagine or recall activities.

Finally, we have the extreme of falsification by the artist-writer, who, like Stevenson at times, or like Carroll in his "Alice in Wonderland," deals with altogether imaginary lives of imaginary people. Yet this art of literature,

STATUE OF A BISHOP, RECENTLY REMOVED FROM THE SPIRE OF ST. MARY'S, OXFORD.
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which assumes such a wide range of untruth in its technique, is the form of art in which those express themselves who speak loudest to-day in favour of realistic dogma.

Perhaps the strongest corroboration of this argument is furnished by the art of music, as it has developed in modern times; for in music the absence of realism is very marked, while, on the other hand, the musician is dominated by—some, indeed, will say overburdened by—artificial and unreal conventions of many kinds.

And if we turn to architecture, with which we are most concerned in this article, we find the same characteristics emphasised in a very distinct way; these characteristics, however, need not be dwelt upon at length just here, for in the course of what follows they will be referred to very fully.

At the moment it will be well to mark one conclusion to which we are forced. It is impossible to believe that all the assumptions of unrealities above referred to are irrational; we cannot agree that these unrealities are forced upon man, and that the great artist is ever endeavouring to express truth in and through these unrealities that press him down, as must be the case if the realist is correct. Rather, on the contrary, must we agree that these unrealities have been deliberately assumed by man in the course of his æsthetic development; and this becomes clearer when we discover that this assumption of unrealities by the artist is easily explicable.

The first artists were those who tried to produce beautiful objects which they could contemplate whenever they so desired—that, is they had perceived beauty in Nature, had mourned its evanescence and sought in some way to make it permanent. Naturally, they attempted to gain this end at first by imitating the beautiful and admired object. But presently they discovered that they were able to make their work more thoroughly beautiful if they assumed certain unrealities in order to enable them to emphasise certain qualities which were necessary to the beauty for which they were in search. And, as a matter of fact, we find when we come to consider it that unconsciously they have always assumed these unrealities in some measure.

The artist always does his best when he produces by the use of any special material or method effects which cannot be as well or as economically produced by any other technique; and this fact forces the artist who uses any special medium to emphasise the qualities which this medium enables him to present most effectively at the expense of others which cannot be so effectively treated; these latter are thus thrown into the background, to the loss of their reality but to the great gain of æsthetic result.

It is because we accept this principle, though usually unconsciously, that we object as most of us do to coloured sculpture; for mere colour effects can better be produced by the painter than by the sculptor, while beauty of pure form can be better presented in sculpture than upon the painter's canvas. For the same reason critical people have come naturally to object if they find the water colourist using solid opaque colour, as though oil pigment were its medium. They do not object, mark you, because this misuse of material opposes a principle which they have gained by generalisation, for few indeed are the critics of art who know anything about general æsthetic principles: they object because they have adopted a convention of unreality which makes such technique illegitimate, and they have adopted this convention because they have learned that transparent washes of water colour laid upon light reflecting paper enable the artist to produce beauties of relations of light which solid non-transparent oil pigments can never give.

For the same reason again do the musical critics object to "programme music." Why they object they can perhaps not tell you, but it is surely because they appreciate that for the artist who would express himself in this direction literature furnishes a better medium than music does; while the conventions of literature, if applied to music, limit its flow and development in a most unfortunate manner. They realise that reality should be sacrificed if special beauty is attainable by the sacrifice.

It is thus that we can account for the persistence of the conventions of which we have been speaking, and their existence for ever discredits the dogmatism of the realist by showing that thoroughgoing truth is not necessary to the highest forms of beauty, and that the expression of truth and the production of art work are in no sense co-ordinate.

It may be taken for granted then that the current doctrine of realism is not a sound one; and yet some reader may say to himself as he reads: "It is remarkable that this doctrine of the realist is so very persistent if there is so little in it; may there not be, nay surely there must be, some basis for the doctrine if it has kept alive, as it has, ever since Aristotle's philosophic ancestors began the discussion of Æsthetics." This objection, indeed, seems to be well taken; but it is not difficult to explain the reason this discredited doctrine keeps everlastingly bobbing up, and in stating this reason we shall indeed find the truth at the base of this supposititious principle of the realist.

We men and women are persistently bad logicians, and when we find that an argument serves us well on the whole we take it for granted that it is valid. We discover that non-X gives us Y, and from that we very commonly draw the illegitimate conclusion that X will give us the opposite of Y.

We say clear sky, no rain; and then not clear skies; that is, cloudy skies, therefore rain. Now this conclusion is not a valid one, and as a matter of fact we know it does not always rain when it is cloudy; nevertheless for practical purposes the argument serves us very well, for it so often does rain when it is cloudy that most of us go without our umbrellas if it is clear and take them if it is cloudy; and we should consider ourselves incapable of judging from experience if we did not do so.

It is in accordance with this bad logical habit of ours that we take certain experiences which give us a sense of ugliness, and argue that if we could gain opposite experiences we should gain beauty, which is the contrary of ugliness; but this surely is an entirely illegitimate conclusion.

Men note, for instance, that objects in Nature which depart widely from her types are ugly—the monsters of one kind or another; and they, therefore, say "follow Nature's types" or "imitate Nature" and you will produce beauty. But what right have they to make this statement? It is true, indeed, that we shall not produce ugliness if we follow Nature's types; but no arguments from such premises ought to lead us to expect to gain the opposite of ugliness, *i.e.* beauty, by picturing Nature's types. All we can be sure to gain by this means is the absence of ugliness.

Or to take another instance. Certain students of æsthetics have noted that inharmonious relations of colour or form or tone are ugly, and they have argued that if we produce harmony we shall gain beauty; and these theorists have raised the doctrine of harmony to the dignity of a basic principle in æsthetics. But a proper argument will surely lead to no such conclusion. All that we can certainly expect if we avoid discord is a lack of ugliness, not necessarily an acquisition of beauty.

Now it is in this same manner that the realists reason. Having noted that unreality, untruth, are essentially disagreeable and hence ugly, they argue that if we gain the opposite of unreality and untruth, that if we gain impressions of reality and truth, we shall have obtained beauty, which is the opposite of ugliness. Upon this fallacy is their theory based.

But here again we find the invalidity of the conclusion. If we avoid untruth we shall in fact avoid so much of ugliness as was determined by this untruth, but by no means is it a fact that we shall gain an impression of beauty.

The correct doctrine for us to inculcate then is not the realist's dogma, "Strive to express truth," but a much more modest doctrine—"If you would produce beauty begin by avoiding untruth."

And now if we apply what we have been saying to the art of architecture we find that we have in this principle of truth, of sincerity, of veracity, as applied to the art of architecture but a half truth, as, indeed, we have seen that the doctrine of artistic realism in all its modifications expresses but a half truth.

In architecture, as in all the arts, untruth, insincerity, lack of veracity and pretence are in general disturbing, unpleasant and therefore ugly; if a work of architecture, therefore, is to have permanent æsthetic value it must avoid the expression of untruth and pretence.

Now the easiest way for the lazy thinker to manage to avoid this expression of untruth and pretence is to bear in mind, and to some extent to express, the truth. But this mere expression of truth will never make a work of man's hand æsthetic: the æsthetic quality is something which must be superadded.

The aim of every artist should be to produce an object of permanent beauty in whatever material he expresses his conception: this he cannot well do if he shocks the observer in any way whatever, and one of the worst of shocks is that of unreality. If the artist be an architect he cannot succeed in producing the effect of permanent beauty in his buildings if he persistently lies about the construction he adopts, or if he constantly deceives us about the uses of the apartments he erects; but this is due not to the fact that where he succeeds in producing an æsthetic result the truth is expressed, but to the fact that lying and deception are in themselves anti-æsthetic. For mere sincerity and lack of pretence in one's architectural work will not make it artistic; to this negative lack of deceit must be added the positive quality of beauty which brings to the masses of cultivated beholders a permanent feeling of pleasure.

It cannot be denied that the architectural student gains a certain practical value from the emphasis of the dogma of truth: wherein this value lies becomes clearer if we take a familiar analogy from our ethical life. It is more effective to teach the child the importance of speaking the truth than it is to correct him for falsehood. Nevertheless in ethics we practically try to keep in mind general ethical ends, and often quite properly avoid blurting out perfectly certain truths when they are unimportant and inopportune. Correspondingly in æsthetics, it is easier to emphasise its value of truth than the necessity of avoiding insincerity; nevertheless, it is perfectly legitimate and often most advantageous in architecture to avoid emphasising some special structural truth, some uses of parts of buildings, provided this emphasis would involve the production of forms that are distinctly ugly; and this we do quite properly, as we easily see if we constantly bear in mind that the end for each and every artist and for the architect as an artist is the production of a work of beauty.

We have thus far been treating almost altogether of theory, but if the position we have thus taken be correct then the architect in the guidance of his artistic efforts may well make certain practical applications of the principles involved, negative though they be; and the reader as a helpful and appreciative critic may well take them to heart as guiding principles in judging of the architect's efforts to attain beauty in the buildings which he erects. There are just two results of our study which there is space here to bring into prominence, and both of these, the reader will find, bear directly upon the subject we have undertaken to consider in this article.

In the first place, the architect is taught that he should aim to avoid the pretence of constructional effects which evidently cannot exist; but having done this he must equally avoid the expression of constructional effects which are not beautiful. It may be true, if we may take an analogy from a kindred art by way of illustration, that the human frame is made up of bone and muscle, and the artist-sculptor will certainly not model his figure so that it will appear to be apparently unanatomical—unconstructional, so to speak; nevertheless the most perfect reproduction of anatomical detail will not make a statue beautiful, nor should we consider the sculptor to be in any sense an artist who on principle represented his human subjects as exceptionally thin in order to emphasise the position of bone and muscle which make their attitudes possible. Similarly is it true that buildings could not stand did there not exist certain balancing of forces, certain strain on material parts, certain lines of thrust and pressure; but evidently to strip a building of all beauty in order to express this balancing of strain and thrusts and pressures would be manifestly absurd from an artistic standpoint, and this point critics should not fail to bear in mind; for the critic who so emphasises the delight e obtains in the architect's expression of these hysical forces, that he finds in such expression lone the true essence of architecture, is as bnormally warped in his æsthetic development s is the surgeon who finds beauty in a skeleton r in a fine piece of dissection or in a skilful reparation of cancerous tissue.

The architect should aim in all cases to pro- uce a beautiful building; to this end he must void obvious constructional untruth which for ost intelligent men is ugly. So far as in him ies he should also aim to emphasise the con- tructional and practical values of the parts of is structure, and he should do this for the imple reason that such emphasis tends to be ttractive to the intelligent observer. But he hould never emphasise these constructional and ractical values at the expense of a loss of eauty; nor need he strive for this emphasis nless it is possible to gain it in a manner which ill actually add to the permanent æsthetic alue of the building as a whole.

But as the architect should avoid giving the bserver the shock which constructional untruth ntails, so also should he avoid shocks of all orts and kinds, for such shocks always involve ore or less of ugliness.

And here again appears the value of this egative principle of which we are speaking; or not infrequently the architect finds in ractice that by the adoption of some scheme hich involves a minor inconsistency of con- truction he may avoid other shocks of much reater importance; for instance, shocks caused y bad proportion or lack of symmetry.

Suppose the architect has built a large fire- roof hall across the ceiling of which a heavy irder must cross dividing the ceiling into un- ymmetrical parts. Here he has an ugly ceiling. le may remove this ugliness by furring down he ceiling to the bottom of the girder so that e may obtain a perfectly flat ceiling of sym- etrical form. No one will contend that this improper, because in order to avoid leaving n ugly ceiling he has masked the ugly girder, ut this arrangement compels the architect to wer the whole height of his room, and this may e disadvantageous. Now if this girder is ex- osed it must be protected against fire by anging down over it a covering of terra-cotta locks, which are plastered over for further rotection. This leaves the ceiling of a very gly form. There seems no reason why he ould not hang down other sets of terra-cotta ocks which do not cover girders in order to ake the ceiling symmetrical, if he is thus able make a beautiful ceiling instead of an ugly ne. This, indeed, will involve a minor incon- stency of construction, which usually nobody ut the workmen and architect know of, but, on e other hand, it enables him to avoid a very portant shock which would be caused by the ck of symmetry in the ceiling and gives him n opportunity for decorative treatment of this iling which he could not otherwise obtain.

The ideal architect, to be sure, would of course able to avoid all shocks of all kinds; but we or human beings all too often find ourselves lled upon to make a choice of the lesser evil, d surely the architect who is merely human ould not be condemned if he asks us to over- ok some inconsiderable untruth of structure use for the sake of the better æsthetic results may thus obtain. He may well argue that at st we can express but partial truth in any art; e truths which the most thoroughgoing realist wont to emphasise are only some of many ich he chooses to consider, whilst he leaves t of sight many others which but for mere nvention might as well be considered as those ich he aims to express. The sculptor, for stance, in general, as we have seen, assumes onventional falsity of colourlessness which he s us to overlook in order that he may the tter express certain beauties that are inde- ndent of colour. So in architecture there are ny other truths than those of structural ust and strain or of practical use which all istic architects (and even those who labour enuously to express constructional values) ve come to overlook entirely, and this with fect propriety in consideration of the fact t the end in view is the production of beauty: , they overlook the expression of the nature their foundations, of the filling in behind ir finished protective and ornamental stone ings, of the masonry and furrings back of their plastered interior wall surfaces. If, then, in the effort to build beautiful buildings it is permissible for the architect to forget some of many realities, why should he not occasionally ask us to pass over some slight structural disingenuousness provided he is able by such means to produce a nobler type of beauty than were possible if he did not disregard this minor inconsistency?

Architecture more than all the other arts is replete with forced compromises. A symmetrical exterior, for instance, may produce æsthetic results which could not be gained were all the minor lack of symmetries in plan emphasised upon the exterior. The artist must trust to his genius to determine for him how far he can afford to sacrifice one element of beauty in his effort to gain another; and the fact that he is an artist is attested by the fact that the structural truths he fails to express are forgotten by the observer in the beauty of the results attained.

Let us now consider a second application of the theoretical study which we made in the beginning.

We have inherited from a long line of our artist ancestors many architectural forms of great beauty which have arisen in constructional usage, all too often very faulty from our modern scientific standpoint. Thus it happens that inherited architectural forms more or less illogical have been refined and beautified until they have become in themselves æsthetic elements capable of employment for the purpose of adding artistic quality to buildings much as the artist in colour adds to the value of his painting by his technique; and there seems to be no manifest reason why the modern architect should not use such element, as in fact his ancestors always have done, to beautify his work without too great regard for their constructional worth, only provided he does not use them for purposes of intentional deceit.

We may illustrate this by reference to the types of the arch in general use on the exterior of buildings and which are accepted by all of us as beautiful in form.

In the ordinary round arch the pressure line runs in a direction which is not concentric with the curve of the arch. Certain parts of the arch stones are, therefore, constructionally valueless, and if we attempt to work quite logically we should build our arches in a strangely ugly form, keeping the line of thrust in the middle of our arch stones and increasing them in width from top to bottom. We should furthermore give up the emphasis of the keystone, for there is no constructional reason why this should be larger in height than the next stones to it. But think what would be our æsthetic loss if logical criticism compelled us to discard the use of all arch forms which do not comply with the logical constructional thrust lines. Not only the round arch would disappear from our exteriors but all forms of the pointed arch which make the glory of Gothic architecture.

And in this connection it may be well to note that we should to-day be unable to enjoy the beauty of the maze of flying buttresses in the Gothic cathedrals had the mediæval architects understood how to calculate thrusts as accurately as we do and had they expressed these thrusts logically. In the construction of a vaulted roof held in place by a double set of flying buttresses such as is seen in the great cathedrals of France the thrust of the main vaulted roof does not correspond with the form of either of these sets of flying arches but with a line which cuts through the wall between the height of the two. There is evidence that the first builders of the large vaulted roofs put in only one set of flying buttresses, but finding that when they did so the walls were pushed out at another point they then put in the other set of buttresses to counterbalance this newly-discovered pressure. In subsequent structures they then used the double set of buttresses from the start.

The mass of flying buttresses thus built gave the architects of later cathedrals the type which they developed as we know (yet as we have just seen quite illogically) into the beautiful forms which entrance us as we view their finished works.

It is thus that great architects have invariably used forms developed in constructional practice as merely decorative features; and if the beauty of the result is sufficient to arouse our enthusiasm we do not hesitate to condone the slight inconsistency. It is thus that the Romans used the Greece-born order, being content to accept and adopt forms perfected by long use in other relations than those which were appropriate to their civilisation, and while adapting old forms added elements of grandeur and proportion which lead us to overlook altogether the illogical usage. It is thus that the Venetians used old constructional forms as purely decorative elements to add to the beauty of their well-studied compositions; and we forget, and quite properly forget, the inconsistency in the joy we gain from the entrancing groupings in their waterside palaces.

It is, of course, to be conceded, as has been suggested above, that the ideal architect or race of architects would avoid such inconsistencies, but even in the architectural work of the Greeks, which reaches to the highest grade of structural consistency, we find—*e.g.*, in the triglyphs, the modillions, the dentils, of their masonry temples—the use of forms which had been perfected æsthetically in wooden structures, and which were then used decoratively, but from a structural standpoint not truthfully, in stone construction. In the development of the Gothic cathedrals, which many think of as the best examples of an architecture of thoroughly logical construction, we can easily trace the same practice; for example, in the use of many tiers of flying buttresses of which we have spoken above; and again, when we note the blundering steps by which the columns of the basilica, used first as mere columns, were gradually transformed into buttresses where engaged in the walls, or into piers where standing isolated and free.

Our conclusion, then, is this, that the expression of constructional truth in architecture is only one element amongst many which are at the command of the true artist-architect for use in the production of beautiful buildings—a most important element indeed, and one which if skillfully used must add great satisfaction to the trained observer; one also which cannot be disregarded without great risk of ruining the beauty of the building in which the architect is expressing his thought. But, for all that, we are compelled to agree that in many cases this constructional and practical worth may quite properly be subordinated to other elements which are incompatible with it provided the latter without it are capable of producing æsthetic results which with it would be impossible of achievement.

In closing it will be well to make a practical application of these contentions to the reader as a critic; and, first, let us beg him to consider the many difficulties with which the architect has to contend, and let this thought modify the harsh judgments he is wont to make on the results they attain. We do not ask him to condone their failures; nor should he be satisfied with ugliness, nor be content unless the buildings they design are beautiful when finished. But it were well if he always looked for the beauties and not for the faults, and this not for their sakes as much as for his own.

It is so easy for the critic to establish in himself artificial standards which no artist can reach, or in fact ought to try to reach—standards which will prevent him from catching the beauties which the artist intended to present and has succeeded in presenting.

The notion which we have been considering is one of these artificial criteria. If we demand that all structural values, that all uses, shall be expressed to us in a building, and that no forms which have been perfected by past structural usage shall be employed non-structurally and merely as ornament, and if we refuse to acknowledge that a building is architecturally noble unless it meets this demand, then certainly we shall find ourselves forced to hold that no truly architectural building has ever been constructed.

But if we agree to gain delight from all forms of beauty which the architect can present to us in his building (and amongst these we, if we choose, may give pre-eminent place to the expression of structure and usage), if we condemn only ugliness and real failures of taste, then not only shall we aid the artist by higher appreciation of his effort but we shall add to our own delights in studying the architectural works of the past and present, joys which will be utterly unknown to us if we fail of such breadth of appreciation as we should surely strive for.

Keystones.

A Statue of Chevreul, the famous chemist, was erected in Paris recently.

The Monument to Charles Garnier, the architect of the Paris Opera House, will be the first to bear the new City Arms, which incorporate the Cross of the Legion of Honour.

At the University Extension Meeting at Oxford which will open on August 2nd lectures will be given on the housing problem, and the economy of John Ruskin, and the architecture of the period. On August 10th a conference will be held on "The Housing Problem."

A New Bȧptist Chapel at Walsgrave-on-Sour, Warwickshire, has been erected. The population consists almost entirely of agricultural labourers and miners. After their work in the pit, many of the latter spent hours a day removing loads of soil, in preparation for the builder. The women helped by cleaning and scraping the bricks taken from the old building, while all subscribed in money to the funds.

A New Fire Station is being erected for the London County Council, at the junction of Woolstone Road with Perry Vale, Forest Hill. The site was acquired in 1894 for £535. The plans were approved in 1896, but just at that time there was a change in the command of the brigade, and the alterations suggested by Commander Wells caused delay in erecting the station, the estimate for which was £11,900.

A New Hospital for the Treatment of Consumptives, erected by Sir Robert and Lady Pullar, of Tayside, on the western slopes of Kinnoull Hill, Perth, was formally handed over to the Society for the Relief of Incurables and Chronic Disease recently. The total cost of the building has been £8,000. The house, which is sheltered from the north and east winds, faces due south, and commands a very fine view. The grounds extend to over six acres. Accommodation is provided for twenty patients, one wing being set apart for men and the other for women.

Isolation Hospital for Handsworth.—A Local Government Board enquiry was held recently into the application of the South Rotherham, Handsworth, and Kiveton Park Isolation Hospital District Committee to borrow a sum of £16,000 for the purchase of a site and erection of a hospital at Aughton. No opposition was offered to the scheme. The site is contiguous to the Rotherham and Pleasley Road, and there is easy communication by road to all parts of the district. The altitude is 325ft. The number of beds proposed to be provided is thirty-two, and the estimated cost of the building is £14,301, made up as follows: Administrative building, £3,300; laundry, mortuary and stables, £1,966; lodge, £367; scarlet fever block, £2,867; enteric fever block, £1,455; isolation block, £1,267; boundary walls and entrances, £800; roads and laying out grounds, £350; drainage, £210; architect's commission, £629; furnishing wards, £640; furnishing administrative block, £450; total, £14,301. Mr. J. W. Webster, Sheffield, is the architect for the hospital.

A New Wesleyan Church at Erdington, Birmingham, is being erected immediately in front of the existing one, and the structure is to face Station Road, from which the main entrance will lead. The church is to be of Early English Gothic design, carried out in brick with stone dressings. It will consist of a nave, and aisles separated from the nave with granite columns and moulded arches, and will afford seating accommodation for 650 persons. The main entrance will be formed by a stone archway with stone columns; the windows are to have stone mullions and tracery; and the roofs will be covered by red tiles. A five-light traceried stone window will light the chancel. Provision is made in the design for the future addition of a tower and spire, and of transepts when further accommodation becomes necessary. Messrs. Ewen Harper & Brothers, of Corporation Street, Birmingham, are the architects. The work is being carried out by Mr. Isaac Langley, of Tyburn, and is expected to be completed about the end of May next year. The new church is to cost rather more than £3,000.

Ten Workmen's Dwellings at Esher are to be erected for the Esher and the Dittons Urban District Council at a cost of £2,250 on the Council's land at Lower Green.

Copies of the "Builders' Journal" are wanted of the issue for February 7th, 1900. In return for the favor we offer a copy of the current number of "The Architectural Review." Will readers who have copies of the above date to spare kindly address them to the publisher of the BUILDERS' JOURNAL, Effingham House, Arundel Street, W.C.

Newport Parish Church, Dundee, is to be extended and a manse erected. The present transepts and vestry are to be removed, and the church given an additional bay, enlarged transepts, new chancel, organ chamber, vestry and session-house. An additional entrance to the church is to be placed on the east side. At present the building contains sitting accommodation for 400; the addition will increase that capacity to 600. The character of the additions will be in harmony with the original structure, which was built in 1870. The manse is to be erected on the ground immediately to the west of the church. It will contain dining-room, drawing-room, study and five bedrooms. In both instances the plans have been prepared by Messrs. Johnston & Baxter, Dundee.

The Middlesbrough Corporation Baths, after undergoing extensive alterations, were re-opened last week. The Corporation Baths were established in 1884, when eight slipper baths and a swimming bath were provided, but this provision was soon found to be inadequate for the requirements of the town. An enlargement was decided upon three or four years ago when the plans of the borough engineer, Mr. F. Baker, for twenty-one additional slipper baths, a Russian bath, a needle bath, new offices and dressing rooms, and improved ventilation and heating arrangements were agreed to, and the whole have now been carried out at an estimated cost of £4,500 by Mr. Baker and Messrs. Bastiman & Co., contractors. The electric lighting installation was in the hands of Messrs. T. B. Watson, of Stockton; Messrs. Braithwaite, of Leeds; and Messrs. Richards & Co., of Darlington, being entrusted with the heating and ventilation arrangements, and the plumbing work was carried out by Mr. Lambert, of Middlesborough.

The Hillhouse Free Wesleyan Church and Sunday School, Huddersfield, are being extended on the north side, between the chapel and the end of East View. The scheme provides for a chancel, lecture-room, enlargement of the existing Sunday school, nine additional class rooms, an organ chamber, the introduction of the electric light, &c., at an estimated cost of £2,000. The style of architecture adopted is Italian Renaissance of a plain character to harmonise with the chapel and the adjoining houses. The architect is Mr. B. Stocks, of Huddersfield, and the work is being carried out by the following local contractors: Mason, Mr. J. R. Flynn; joiner, Mr. Kilner Wilson; plumber, Mr. George Hardcastle; slater and plasterer, Mr. W. E. Jowitt; painters, Messrs. Lund and Cardno; heating engineer, Mr. J. W. Thornton; electricians, Messrs. Crossley & Bould.

A New Girls' School for Acton.—The new Haberdasher Aske's Girls' school has been erected in West Acton, one of the most important and up-to-date girls' public schools in the western district. It stands on 2½ acres of ground on the Springfield Park Estate and provides accommodation for 350 pupils. It has an assembly hall 15ft. by 35ft., having a gallery on two sides, and about ten large classrooms, nearly all with wide outlooks on to the country. They are fitted up with separate desks, heated by hot-water pipes and well ventilated. There is also an art-room, a needlework-room, lecture theatre fitted up with a stove, &c., for cookery demonstrations; a chemical laboratory, four music cubicles and music-hall, dining-room, a mistresses'-room and headmistress's-room, cloak-rooms and other offices. There is also a large and well-equipped gymnasium, a playground of over 2 acres, provided with tennis-courts, hockey-ground, and children's gardens, and a covered playground for use in wet weather. The school was designed by Mr. Henry Stock, F.R.I.B.A., and built by Messrs. Patman & Fotheringham.

In the Competition for the New Municipal Buil ings for Hereford forty-six designs have been r ceived. Mr. Thomas Blashill, F.R.I.B.A., ha been appointed assessor to help the committe in their selection. Premiums of £100 each a offered for the three best designs.

Infectious Diseases Hospitals for Radcliffe an District.—A Local Government Board enquir was held recently at Manchester into an appl cation made by the Lancashire County Counc for sanction to the borrowing of £40,000 for th provision by the Radcliffe, Ramsbottom, Whit field and Bury Joint Isolation Hospital Committee of an infectious diseases hospital and small-pox hospital on land at Ainsworth. Th site is about fifty acres in extent. There wi be fifty-six beds in the infectious disease hospital and thirty-two in the small-pox ho pital. Mr. H. Lord, architect, of Mancheste said the estimated cost was £34,164, the amoun allowed for contingencies was £3,416, architect charge (which included clerk of works) £2,42 making a total of £40,000. There would b bedrooms for eleven nurses in the infectiou diseases hospital, and eight bedrooms for nurse in the small pox hospital, with dining-room, &c and offices. There was no opposition to th scheme.

A New Girls' Home has been erected of bric and wood at the Leicester Children's Summe Camp at Mablethorpe. It is situated in hollow among the dunes, or sand hills, tha fringe the shore. Built in two storeys, th home provides accommodation for forty girl besides the attendants. On the ground floor the dining-hall, a well-lighted room, 60ft. b 24ft., the match-boarded walls and ceiling which are painted in light green and red, alt gether a pleasant and cosy room. A wide stai case leads up to the dormitory on the first floo this being a room as large as the dining-hal and containing forty single beds. The matron and attendant's room adjoin the dormitory, an there is an additional bedroom, for the use members of the Ladies' Committee who accom pany the girls. On the ground floor there is well-appointed kitchen, with cooking range, &c and also a large bath-room. The exterior wal are protected with corrugated iron, and the ro has an outer covering of red curved tiles, wit a sloping verandah at the front. The buildin was designed by Mr. Joseph Toone, of Highcro Street, Leicester, who has given his servic gratuitously.

Trade and Craft.

Homan & Rodgers' New Catalogue.

The new catalogue of standards and tables constructional steelwork which has been issue by Messrs. Homan & Rodgers, the well-know iron and steel merchants and construction engineers, of 17, Gracechurch, E.C., is extreme well got up. The catalogue is not of the usu trade kind, but is in handy pocket-book for neatly bound in leather, and partakes more the nature of a note-book of formulæ a tables. Among the large amount of useful i formation we may refer to the method of ca culating the stresses produced by loadi stanchions on one side only, tables for asce taining the deflection of a girder under vario conditions, and a table of useful sections showi the loads they will safely support. T stresses caused by loading stanchions eccent cally are generally neglected by architects a failure results, as this subject is of considerab moment, the elastic deflection of the girde causing the stanchions to deflect materially; can therefore commend this part of the wo highly. The calculation of an eccentrical loaded girder is also shown most clearly. T calculation of the foundations for columns a walls is usually neglected and the meth shown here should prove very useful. The cat logue reflects the greatest credit upon its co pilers, Messrs. Ernest Homan and Leopo Menseh, and all architects and construction engineers should endeavour to obtain a cop If the forthcoming separate catalogue on fi proof construction is as good as this, Mess Homan & Rodgers may congratulate themselv on having produced two of the neatest and m useful in the trade.

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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ATTERCLIFFE.—For alterations and additions to Steel Works, Warren Street, Attercliffe. Mr. H. J. Brettoner, architect, Penistone:—

£1,522 for Contracts Nos. 1 & 3.

AYLESBURY.—For the erection of a new residence, Rickfords Hill, for Mr. W. Crouch. Mr. Fred Taylor, A.R.I.B.A., architect. Quantities supplied by the architect:—

Honour & Son	£2,700
Cook & Son	2,575
G. H. Gibson	2,541
Webster & Cannon	2,458
W. Y. Green & Co.*	2,354

* Accepted.

AYLESBURY.—For the erection of a pair of villas in Manor Park, for Mr. Chimes. Mr. Fred Taylor, A.R.I.B.A., architect:—

J. Holland	£928
Mayne & Son	780
Webster & Cannon	720
W. Y. Green & Co.*	705

* Accepted.

BARKING TOWN.—For the supply of condensing plant, &c., for the Urban District Council. Mr. A. Hugh Seabrook, A.M.I.E.E., A.M.I.M.E., engineer and manager:—

Worthington Pumping Engine Co., Queen Victoria Street, E.C., tower £920, condensing plant £1,816	£2,736
Wheeler Condenser Co., Queen Victoria Street, E.C., tower £878, condensing plant £1,696	2,574
J. Fraser & Co., Millwall, evaporative condensing plant	2,375
Mirrlees, Watson, & Yaryan, Glasgow, condensing plant £2,148 (afterwards corrected to £1,728), Koppel tower £340	2,068
Klein Engineering Co., 94 Market Street, Manchester, natural-draught tower £377, condensing plant £1,688	2,065
Allen & Son, Bedford, Koppel tower £305, condensing plant, Edwards pump, Baker separator, £1,750*	2,055
Pulsometer Engineering Co., Nine Elms Ironworks, S.W., condensing plant only	1,744
A. Koppel, 27 Clement's Lane, E.C., natural-draught tower £305, condensing plant £1,080	1,385
Doherty & Donat, Manchester, tower only	490

[Engineer's estimate, £2,000.]
* Accepted.

BOOTLE.—For Wire Rope Works, Bootle, for Messrs. R. S. Newall & Son, Ltd., of Washington, co. Durham. Mr. J. H. Havelock-Sutton, architect, 101 Dale Street, Liverpool:—

J. W. Weeks & Son	£12,934	Isaac Dilworth	£9,300
J. Henshaw & Sons	10,569	Haigh & Co.	9,249
Roberts & Robinson	9,900	Samuel Fowler	9,170
Horace Kelly & Bro.	9,736	F. W. Mayor & Co.	8,909
Haugh & Pilling	9,648	J. Paterson & Son	8,889
Brown & Backhouse	9,600	Peter Tyson	8,769
Walter Musker	9,363	J. & G. Chappel*	8,617

* Accepted.

BRIDGEND (PERTH).—Accepted for the erection of business premises in, for Miss Webb. Mr. James Marshall, architect, Perth:—

Mason, Robert Goodall, Errol.	Plasterer, D. Campbell.
Joiner, William McQuibban.	Glazier, C. Alexander.
Slater, W. G. Ramsay.	Iron and Steel, G. Crystal.
Plumbers, J. & A. Miller.	

[Rest of Perth.] [£1,700.]

BRIXHAM—Accepted for the erection of dwelling-house and shop, Bolton Street, Brixham, for Mrs. S. Bartlett. Mr. Norman G. Bridgman, A.R.I.B.A., architect, Bank Chambers, Paignton:—

W. Wyatt	£470	0
T. Silley	434	19
Hazlewood Bros.*	375	0
T. Cormich	361	0

[All of Brixham.]
* Accepted.

BRIXHAM—For alterations and improvements at No. 1 The Strand, Brixham, for the Royal National Mission to Deep Sea Fishermen. Mr. Norman G. Bridgman, A.R.I.B.A., architect, Bank Chambers, Paignton:—

Scheduled prices for
Mason, bricklayer, and carpenter, G. Cooksley.
Plumbing and ironmongery, &c., R. Elliott.
Painting and decorating, Hockings.
Cabinet work, fittings, and furniture, Philp.
[All of Brixham.]

CARLUKE.—Accepted for the erection of business and residential premises, Clyde Street, Carluke, for Mr. Thos. Gibb. Mr. And. J. Riddell, architect, Motherwell and Carluke:—

Mason, J. Bryce, Carluke	£700	5	10½
Joiner, W. S. Martin, Carluke	780	16	8½
Plumber, J. McEwan, Carluke	256	0	9
Slater, J. Thomson, Motherwell	67	9	7
Plasterer, J. Laidlaw, Lockerbie	167	9	4

Total, £1,972 2s. 3d.

CHESHUNT (HERTS).—For the erection of three shops and dwellings, Goff's Oak, Cheshunt, for Mr. A. W. Birt. Mr. John Parish, architect and surveyor, Clapton Park, N.:—

Lawrence & Sons	£1,449
Knight Bros.	1,371
Edwards	1,350
Jennings & Grenfell*	1,295

* Accepted.

CHRISTCHURCH.—For a new board room and a nurse's house, for the Guardians of Christchurch Union, Hants, to be erected on the workhouse premises. Mr. Edgar H. Burton, architect:—

T. Tiller, Christchurch	£4,340
Miller & Son, Bournemouth	4,308
Jenkins & Sons, Bournemouth	4,260
S. Whittaker,* Boscombe	3,974

* Accepted.

DERBY.—Accepted for the erection of a pair of semi-detached villas, Strutts Park, Derby, for Mr. A. Alimund. Mr. S. Cousins Battershill, architect, High Street, Ripley:—

R. Weston & Son	£1,200

DUDLEY.—For new sewerage works in the Netherton and Woodside districts, comprising about 17 miles of sewers from 9 in. to 18 in. diameter, manholes, lampholes, flushing chambers, &c., for the Corporation. Mr. John Gammage, C.E., borough engineer:—

Mackay, Smethwick	£21,945
McCarthy, Manchester and London	21,927
Holloway, Wolverhampton	21,266
Owens, Wolverhampton	21,100
Hughes, Dudley	20,301
S. Saunders,* Earl's Court, London	18,818

* Accepted.

EDZELL.—Accepted for the erection of a new school. Mr. D. Wishart Galloway, architect, 2 Market Street, Brechin:—

Mason, David A. Crabb, Brechin.	Plasterer, Charles Thomson, Brechin.
Joiner, A. Bruce & Son, Dundee.	
Plumber, J. A. M. Fox, Edzell.	Slater, James Scott, Brechin.

[£2,000.]

ELGIN.—Accepted for the erection of a villa in Mayne Road. Mr. R. B. Pratt, architect, Elgin:—

Masons, Davidson & Kay, Elgin.	Slater, Wilson, Dufftown.
Carpenters, McKay, Dufftown.	Plasterer, Brodie, Elgin.
Plumbers, Ross Bros., Elgin.	Painter, Fordyce, Elgin.

Walls, railings, and ironmongery under another contract.
[£900.]

FLETTON (PETERBOROUGH).—For the erection of a mustard factory at Fletton, Peterborough, for Messrs. Farrow & Co., Boston, Lincolnshire. T. Ellington, builder, &c., Norfolk Street, Peterborough, accepted without competition. Plans, &c., per builder. [£8,000.]

GLOUCESTER.—For the erection of four new cottages and mess room at the docks, Gloucester, for Messrs. G. & W. E. Downing. Mr. Walter B. Wood, A.R.I.B.A., architect, 12 Queen Street, Gloucester:—

J. Leat, St. Paul's Road	£2,556	5	11
A. King & Son, Russell Street	2,478	0	0
W. Byard, Stroud Road	2,410	0	0
W. Jones, Worcester Street	2,300	0	0
Freeman & Jones, Sherbourne Street	2,266	0	0
Gurney Bros., Barton Street	2,203	0	0
A. J. Dolman, Ryecroft Street	2,189	0	0

GILPIN BRIDGE.—Accepted for the erection of a shooting box, for Mr. James Thompson. Mr. Robert Walker, F.R.I.B.A., architect, Windermere:—

Mason, W. Fleming & Son.	Plumbing, painting and glazing, E. D. Burney.
Joiner, G. Thompson.	Plastering, J. Keighley.

HAMPTON.—For the re-erection of "The Windmill" B. H., Hampton, for Messrs. Charrington & Co. Mr. Edward Monson, F.R.I.B.A., architect, Acton Vale, W., and 22 Buckingham Street, Adelphi, W.C.:—

Godson & Sons, Kilburn Lane, N.W.	£2,200
Lascelles & Co., Bunhill Row, E.C.	2,059
Antill & Co., Mornington Crescent, N.W.	2,000
J. Christie, Shepherd's Bush, W.	1,978
J. J. Collings, Norbiton, Surrey	1,841
W. Blackburn,* Chiswick, W.	1,798

* Accepted.

HARROGATE.—For the erection of a kursaal, for the Corporation. Mr. Robt. J. Beale, A.R.I.B.A., architect, Broadway House, Westminster. Quantities supplied:—

Excavator, bricklayer, and mason.

Raworth & Allen	£16,673	0	0
H. Abbot	16,300	0	0
Nicholson & Sons, Leeds	15,486	0	0
Graham & Sons,* Huddersfield	14,313	0	0

Carpenter and joiner.]

F. Pattinson, Ruskington	7,529	0	0
T. Linskill	7,300	0	0
Nicholson & Sons, Leeds	6,577	0	0
J. Taylor, Guiseley	6,490	0	0
J. W. Rudd	6,139	0	0
Raworth & Allen*	5,623	0	0
W. Isherwood, Cleckheaton (withdrawn)	5,188	0	0

Slater.

Raworth & Allen	485	0	0
J. W. Baynes	482	0	0
J. Shepherd	475	0	0
T. Rayner	472	1	0
W. Atkinson,* Leeds	369	18	0

Plasterer.

Johnson & Sons, Mirfield	1,597	11	2
A. & S. Wheater, Leeds	1,456	0	0
Raworth & Allen	1,430	0	0
Fortune & Calverley*	1,410	0	0

Plumber and glazier.

Higginbotham & Sons, Bradford	2,200	0	0
J. H. Shouksmith, York	2,100	0	0
H. Braithwaite, Leeds	2,078	0	0
J. Lindley, Leeds	2,045	0	0
Raworth & Allen	2,040	0	0
G. Thompson, Leeds	2,000	0	0
T. Armitage, Huddersfield	1,995	0	0
C. Foster*	1,971	0	0
H. Lindley, Leeds	1,885	0	0

Painter.

Jessop & Cosgrove	415	0	0
Raworth & Allen	395	0	0
Sparrow & Son, Nottingham	394	0	0
Broadbank & Sons	380	0	0
R. Petty, Keighley	360	0	0
D. E. Hutton, Shipley	359	0	0
Higginbotham & Sons, Bradford	350	0	0
Noddings & Sons*	280	0	0

Whole tenders.

G. Warren	32,959	0	0
Raworth & Allen	26,522	0	0

* Accepted.
[Rest of Harrogate.]

HEBBURN.—For excavating, levelling, bottoming, paving, macadamising, channelling, cementing, &., in Edmund Street, Lyon Street, Dunston Street, Bygate Street, Argyle Street, Makendon Street, Canning Street, Till Street, Beaumont Street, St. Oswald's Road, Back Canning Street, Back Edmund Street, Back St. Oswald's Road, and other streets, for the Urban District Council. Mr. J. B. Renton, surveyor:—

T. Callaghan, 40 Staple Road, Jarrow	£2,326	4	6
M. D. Young, Elm Grove, Hexham	2,582	13	3

[Surveyor's estimate, £2,404 19s.]
* Accepted.

HIGH LITTLETON (near BRISTOL).—For the erection of 11 cottages in three blocks, for the Radstock Co-operative and Industrial Society of Radstock, Somerset. Mr. William F. Bird, architect, The Island, Midsomer Norton. Quantities by the architect:—

E. Walters, Bristol	£3,378
A. Wills & Sons, Bath	3,000
J. Hatherley, Bristol	2,767
T. Keeling, Timsbury, near Bath	2,420
W. J. Heal, High Littleton, Somerset	2,365

LEIGHTON BUZZARD.—For the erection of a cottage at Southcott, for Mr. Leopold de Rothschild. Mr. Fred Taylor, A.R.I.B.A., architect, Aylesbury:—

Garside & Sons	£672
George Heley*	665

* Accepted.

LITTLEHAMPTON.—For the construction of a covered reservoir in Batworth Park, also for the erection and completion of engine and boiler house, engineer's cottage, chimney shaft, fencing, and other jobs at Warningcamp. Mr. H. Howard, E.S.I., engineer:—

Linfield & Son	£8,975	0
A. Burrell	8,366	10
Snewin Bros.	8,327	0
Peerless, Dennis & Co., Langley Road, Eastbourne	8,149	0
W. Wallis	7,989	0
A. E. Nunn,* Tenterden, Kent	7,863	2

Road materials. Accepted tenders:—L. Sommerfeld, 2 Fowkes Buildings, Great Tower Street, London, E.C., Devonshire ragstone, 250 tons at 9s. per ton; Hall & Co., Whyke Road, Chichester, dug flints, 1,100 tons at 4s. 9d. Rest of Littlehampton.
* Accepted.

LLWYNYPIA (GLAM.).—Accepted for the erection of a new hotel to be called the "Park Hotel," at Clydach Vale, Llwynypia, Glam., for Mr. J. Phillips. Messrs. Griffith & Jones, architects, Tonypandy and Cardiff:—

Dan Davies,* Treherbert	£4,475

LONDON, E.—For pulling down and rebuilding 162 and 164 Commercial Road, E., for Mr. L. Frumkin. Mr. Ernest H. Abbott, architect, 6 Warwick Court, Gray's Inn, W.C. Quantities by Mr. Alfred Johnson, 24 Imperial Buildings, Ludgate Circus, E.C.:—

Griffiths & Co., Ltd.	£2,800	0
F. & J. S. Wood	2,756	0
W. J. Maddison	2,596	0
R. & E. Evans	2,559	0
J. Wright	2,427	10
S. Salt	2,426	0

LONDON, N.W.—For new billiard room for Hill Lodge, Campden Hill Square, N.W. Messrs. Rogers, Bone, & Coles, architects, 7 Carteret Street, Westminster, S.W.

Langdale & Hallett	£1,475	Dobson & Son	£1,279
Dowsing & Sons	1,425	Leal, Willesden Lane	1,176
S. & S. Dunn	1,375		

LONDON, N.W. — For the erestion of a Primitive Methodist Church and School at Willesden Green. Messrs. Moulds & Porritt, architects, 52 Queen Victoria Street, London, E.C. :—

	Church.	School.	Total.
T. Thorne	£2,960 0	£1,580 0	£4,540
Godson & Son	2,864 0	1,478 0	4,342
Chinchen	2,765 0	1,479 0	4,244
Allen, Ltd.	2,665 0	1,398 0	4,063
Bristow & Eatwell	2,647 0	1,391 0	4,038
Battley, Sons & Holness	2,656 0	1,341 0	3,997
W. J. Hart	2,536 0	1,350 0	3,886
Cowley & Drake*	2,494 9	1,383 11	3,878

* Accepted.

LURGAN (Co. ARMAGH).—Accepted for the erection of bank premises, for Northern Banking Co., Ltd., at Lurgan, Co. Armagh. Mr. Godfrey W. Ferguson, architect, Belfast :—

J. & R. Thompson, builders	£4,190

NEWCASTLE-ON-TYNE.—Accepted for the erection of warehouses and offices, City Road, Newcastle-on-Tyne, for Messrs. R. Embleton & Son :—

T. & J. White	£1,593

Also stable, &c. behind Crawhall Terrace, City Road, Newcastle-on-Tyne, for Messrs. R. Embleton & Son. Mr. George J. Stephenson, architect, 20 Collingwood Street, Newcastle-on-Tyne :—

R. Veitch	£535

NEW MALDEN (SURREY).—For the construction of the first portion of the roads and sewers on the New Malden Station Estate, for Colonel G. A. Petter. Mr. James Neale, F.S.A., architect and surveyor, 10 Bloomsbury Square, W.C. :—

Rawlings & Son	£11,549 0
W. H. Wheeler	11,391 0
S. Kavanagh*	10,661 14

* Withdrawn, channelling omitted.

NEWTON-IN-MAKERFIELD.—For the renovation of the parish church of Newton-in-Makerfield, for the Rev. J. Carson, rector. Mr. Samuel Dring, architect, Market Chambers, Earlstown :—

Peter Tickle, St. Helens	£399 10
John Rothwell & Sons, St. Helens	386 0
Eli Bunting, Earlstown	351 0
H. Johnson & Sons, Liverpool	346 0
David Ablett, Wigan	338 5
P. Bradshaw, Earlstown	302 0
P. Pennington, Ashton	298 10
Fitzgerald Bros,* Earlstown	292 0

* Accpted.

RATHMULLEN (DROGHEDA).—For the erection of cattle sheds, stables, dairy, &c., at Rathmullen, Drogheda, for Mr. Peter Curran. Mr. Lewis Turley, C.E., architect, Drogheda :—

Bernard M'Donnell	£350
Bartle Collins	334
Frank Gogarty	330
Peter M'Cann*	325

[All of Drogheda.]
* Accepted.

READING.—Accepted for the erection of offices, stabling, &c., at Clark's Lead Works, Queen's Road, Reading. Messrs. J. Greenaway, Sons, & Slade, architects, Reading :—

G. S. Lewis & Brother, Reading	£671

RIPLEY (DERBY).—For the erection of a house, for Mr. J. Lloyd, on Derby Road, Ripley. Mr. S. Cousins Battershill, architect, High Street, Ripley :—

Bricklayer's work, together with mason and plasterer.

W. Harris	£350
Harris & Hunt*	278
Joinery and other trades*	220

* Accepted.

RIPLEY (DERBY).—For the erection of three cottages, for Mr. James Crossley. Mr. S. Cousins Battershill, architect, High Street, Ripley :—

E. Slater	£523 15
Harris & Hunt*	495 0

* Accepted.

RISCA (MON.).—Accepted for the erection of additions to Risca Town Schools, for the Risca (Mon.) School Board. Mr. Geo. Rosser, architect, Risca (Mon.) :—

J. Pritchard, Pontymister, near Newport (Mon.)	£1,065

SANDHURST (BERKS).—Accepted for the erection of four pairs of semi-detached cottages at Sandhurst, Berks, for Mr. H. W. Harris. Messrs. J. Greenaway, Sons, & Slade, architects, Reading :—

W. Hawkins, Reading	£1,955

SLOUGH.—For making two roads and diverting footpath, Montem Estate, Slough. Mr. John Baker, A.M.I.C.E., engineer and surveyor, Slough :—

W. Manders, Leyton	£1,716 1 0
T. Adams, Wood Green	1,683 5 7
J. Deverill, Slough	1,550 0 0
T. Free & Sons, Maidenhead and Bristol	1,509 2 9
H. D. Bowyer,* Slough	1,484 7 2

* Accepted.

SOUTH SHIELDS.—For the erection of villa at Westoe, South Shields, for Mr. J. Watson Pratt. Mr. J. Walter Hanson, architect, 79 King Street, South Shields :—

R. Brown	£1,365 5 10
S. Sheriff	1,337 14 9
R. Summerbell & Son	1,291 0 0
W. J. Robertson & Sons	1,232 7 4
J. Gilfillan	1,194 9 0
J. C. Nichol	1,178 0 0
F. B. Dobson	1,171 8 11
J. Young	1,145 0 0
J. Moore	1,113 0 0
T. Banks	1,110 0 0
C. Henderson*	949 5 5½

* Accepted.

TROUTBECK.—Accepted for alterations at Birkhead, Troutbeck, for Colonel Dawson. Mr. Robert Walker, F.R.I.B.A., architect, Windermere :—

Mason, W. Atkinson.
Joiner, G. Thompson.
Plumber, P. Musgrave.
Plasterer, T. H. Cousins.
Painter, R. Heaton.

WAUNLLWYD (near EBBW VALE, MON.).—For the erection of a school for 500 children, along with out offices, boundaries, playgrounds, and caretaker's house, at Waunllwyd, near Ebbw Vale, Mon., for the Aberystruth School Board. Mr. R. L. Roberts, architect, Victoria Chambers, Abercarn :—

J. Lewis, Caerphilly	£7,790 0
Williams & Rogers, Cwm	6,220 0
P. Gaylard, Bridgend	6,150 0
Meyrick Bros., Sirhowy	5,997 16
Davies Bros., Abercarn	5,990 15
J. Morgan, Blaenavon	5,565 0
D. Lewis,* Aberbeeg	5,516 0

[Architect's estimate, £5,560.]
* Accepted.

WEST END (near SOUTHAMPTON). — For an entirely new system of drainage and sewage works at the Workhouse, West End, for the Guardians of South Stoneham Union. Messrs. W. H. Mitchell, Son & Gutteridge, architects, 9 Portland Street, Southampton :—

S. Saunders, London	£2,200
Witt Bros., Bitterne, Southampton	2,150
Grounds & Newton, Bournemouth	2,130
Roles & Son, Romsey and Southampton	1,975
Jenkins & Sons, Southampton	1,945
Coston & Co.,* Millbrook Road, Southampton	1,895

* Accepted.

WEST HAM.—For making up the following streets for the West Ham Borough Council: Corporation Street, Eve Road (part), Napier Road (part), Ranelagh Road (part), Chaplin Road (part), Meath Road, Harcourt Road, Holbrook Road, Willis Road, Bull Road, Morley Road. Mr. John G. Morley, borough engineer :—

Wilson, Border & Co.	£12,003 4 6
J. Jackson	11,913 10 0
Griffiths & Co., Ltd.	11,797 19 10
D. T. Jackson	11,640 7 11
T. Adams	11,299 9 4
Bentham & Co.*	11,237 19 4

[Borough engineer's estimate, £13,120.]
* Accepted.

WEST HAM.—For the erection and construction of a fire brigade station, firemen's quarters, and underground sanitary conveniences, Barking Road, Canning Town, E., for the West Ham Town Council. Mr. John G. Morley, borough engineer :—

Horlock & Sons	£22,800	Lawrence & Son	£18,320
Foster Bros.	19,990	Leslie & Co.	17,954
Shillitoe & Sons	19,225	Gregar & Sons	17,787
Thomas & Edge	18,562	Works Manager*	17,707

[Borough engineer's estimate, £19,500.]

Extra if Portland stone.

Thomas & Edge	£1,400	Horlock & Sons	£1,300
Gregar & Sons	1,370	Leslie & Co.	1,253
Lawrence & Son	1,350	Works Manager*	1,025
Foster Bros.	1,340	Shillitoe & Sons	1,000

[Borough engineer's estimate, £1,350.]
* Accepted.

WESTCLIFF-ON-SEA.—For the erection of house on "The Leas," Westcliff-on-Sea. Messrs. Greenhalgh & Brockbank, architects, Bank Chambers, Southend, and Broad Street House, London :—

S. Moss	£1,560	F. & E. Davey	£1,267
Shelbourne & Co.	1,418	J. Band	1,284
Woodiwiss	1,414	W. Stubbs	1,232
Davis & Leaney	1,360	W. E. Davey*	1,181
Dupont & Co.	1,295		

* Accepted.

W. SAWREY KNOTTS (LANCASHIRE).—Accepted for alteration, &c. in W. Sawrey Knotts, Lancashire, for Mr. W. D. Grimshaw. Mr. Robert Walker, F.R.I.B.A., architect, Windermere :—

Masons, W. Atkinson.
Joiners, J. Edmondson.
Plumbers, T. Russell.
Plastering, T. H. Cousins.
Painting, F. G. Croft.

WINDERMERE. — Accepted for the erection of residence, for Mr. E. J. Frank. Mr. Robert Walker, F.R.I.B.A., architect, Windermere :—

Masons, &c., W. Atkinson.
Joiners, G. Thompson.
Plumbers, H. Bousfield.
Plastering, J. Keighley.
Painting, F. G. Croft.

[All of Windermere.]

New Companies.

St. James' Park Estate, Harrogate, Ltd.

Registered July 9th to acquire, develop and turn to account building estates and other lands, in particular to acquire an estate situate partly in Harrogate and partly in Pannal, Yorkshire, containing about thirty-three acres, and to carry on the business of builders, contractors, decorators, builders' merchants, promoters, financiers, &c. Capital £52,500 in 500 cumulative preference shares of £100 each and 50,000 ordinary shares of 1s. each. The first directors are T. Hargreaves, A. S. J. Musgrave, J. Cooke and J. B. H. Burland.

Newport Freehold Land Co., Ltd.

Registered July 8th to acquire forty acres or thereabouts of land on the eastern side of the River Usk, Newport, to carry on the business of land and house owners, land, house and estate agents, sand, lime, brick and tile makers and dealers, quarrymen, &c. Capital £2,000 in £5 shares. The first directors are M. Mordey, J. Linton, B. Stephens, E. Watson and T. Goldsworthy. Registered office: The Dry Docks, Newport, Monmouthshire.

Willesden Varnish Co., Ltd.

Registered July 8th to adopt an agreement with G. Guittet for the acquisition of the business carried on by him at Willesden, Middlesex, as Guittet & Co., and to carry on the business of manufacturers of and dealers in varnish, colours, paints and dyes, drysalters, oil and colour merchants, paint and colour grinders, &c. Capital £14,000 in £10 shares. The first directors are G. Guittet, P. Guittet and G. Ferre. Registered office: 8, Hythe Road, Willesden Junction, N.W.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		BUILDING:		
July	26	Salisbury—Infirmary	——	J. Harding & Son, 58 High Street, Salisbury.
"	26	South Brent—Houses and Shops	C. White	E. Richards, Tormsham Manor Office, 7 Strand, Torquay.
"	26	Swanscombe, Kent—Room, &c.	——	Salmon Antifriction Metal Co., 10 Dover Road, Northfleet.
"	27	Sandridge—Additions	School Board	H. E. Hansell, Station Buildings, St. Albans.
"	27	Rhondda, Valley—Police Court	——	Griffiths & Jones, Architects and Surveyors, Tonypandy.
"	27	Leicester—Floor	Baths Committee	G. E. Mawbey, Borough Surveyor, Town Hall, Leicester.
"	27	Leavesden—Mortuary	Metropolitan Asylums Board	Offices of the Board, Leavesden.
"	27	Falmouth—Conveniences	Corporation	Borough Surveyor, Falmouth.
"	27	Drumlithie—House	School Board of Glenbervie	G. Gregory, Architect, Stonehaven.
"	27	Dublin—Boiler House	Markets Committee	S. Harty, City Engineer, City Hall, Dublin.
"	27	Dundalk—New Foresters' Hall	——	P. Cahill, Architect, Seatown Place, Dundalk.
"	27	Brixham—Police Station	Devon Standing Joint Committee	E. H. Harbottle, County Surveyor, Exeter.
"	27	Newton Abbot—Addition to Police Station	Devon Standing Joint Committee	E. H. Harbottle, County Surveyor, Exeter.
"	27	Ramsey, I.M.—Business Premises	——	J. T. Boyde, Architect, Ramsey.
"	29	Abergavenny—Additions and Alterations	Committee of the Mon. Asylum	B. J. Francis, Architect, Abergavenny.
"	29	Glasgow—Substruction of Central Station Extension	Caledonian Railway Company	Engineer, Buchanan Street Station, Glasgow.
"	29	Bervie—Improvements	——	Mr. Andrew, Burgh Treasurer, Bervie.
"	29	Lowestoft—Police Station	East Suffolk County Council	Office of the Surveyor, Lowestoft.
"	29	Bury St. Edmunds—Cooking Classroom	Education Committee	Borough Surveyor's Office, Bury St. Edmunds.
"	30	Cannock—Infirmary of Workhouse	Union Guardians	A. Veall, 84 Darlington Street, Wolverhampton.
"	30	Bury, Lancs—Extension	Electric Lighting Company	A. W. Bradley, Borough Engineer and Surveyor, Bury.
"	31	Beverley—Repairs	——	R. Arnott, 5 Wilbert Lane, Beverley.
"	31	Rugby—Band Stand	Urban District Council	D. G. Macdonald, Surveyor to the Council, Rugby.
"	31	Oswestry—Bricks	Cambrian Railways Company	Stores Office, Cambrian Works, Oswestry.
Aug.	1	Hereford—Cottages	Town Council	J. Parker, Mansion House, Hereford.
"	1	Belfast—Central Depot	Lennon Brothers	W. J. Moore, Architect, Whitehall Buildings, Ann Street, Belfast.
"	1	Newmarket—Cement	Urban District Council	S. J. Ennion, Deva Chambers, Newmarket.
"	1	Chester—Asylum Board	Committee of Visitors	H. Beswick, County Architect, Newgate Street, Chester.
"	1	Chailey, Sussex—Hospital, &c.	Rural District Council	H. Card, 10 North Street, Lewes.
"	2	Sunderland—Sheds	Corporation	Barnes & Coates, 41 Fawcett Street, Sunderland.
"	3	Birkenhead—Offices	Guardians	E. Kirby, 5 Cook Street, Liverpool.
"	3	King's Lynn—Alterations	W. & T. Bagge	H. Tilson, Architect, Railway Road, King's Lynn.
"	5	Newport, I.W.—Library, Technical Institute, &c.	County Council	F. Newman, County Surveyor, St. Thomas Street, Ryde.
"	5	Llandovery—School and House Wings	Governors of College	Wright & Son, Surveyors, Lancaster.
"	6	Merthyr, Wales—Houses	Urban District Council	J. Vaughan, Clerk, Town Hall, Merthyr.
"	6	Torquay—Extensions	Corporation	F. S. Hex, Town Clerk, Town Hall, Torquay.
"	7	Ely, near Cardiff—Schools	Llandaff School Board	Edgar Down, 31 High Street, Cardiff.
"	9	Worcester—Police Station Buildings	Standing Joint Committee	H. Rowe, County Surveyor, Worcester.
"	14	London, S.W.—Superstructure	Commissioners of H. M. Works	A. Webb, 19 Queen Anne's Gate, S.W.
"	15	Fulham—Additions to Workhouse	Guardians	A. P. Snell, 22 Southampton Buildings, Chancery Lane, W.C.
Sept.	16	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ENGINEERING:		
July 27	Dartford—Cooking Apparatus	——	Offices of the Board, Embankment, E.C.
„ 28	Sydney, New South Wales—Bridge	——	Under Secretary, Public Works, Syducy.
„ 29	Stirling—Trenches	Eastern District Committee	Warren & Stuart, 94 Hope Street, Glasgow.
„ 29	Blackburn—Dynamos	Town Council	Lacey, Clirehugh & Sillar, 2 Queen Anue's Gate, Westminster.
„ 29	Ayr—Reservoir	Corporation	J. Young, Corporation Water Engineer, Town Buildings, Ayr.
„ 29	Newcastle-upon-Tyne—Tramway	——	City Engineer, Town Hall, Newcastle.
„ 29	Mountain Ash, Wales—Reservoir	Urban District Council	Urban District Council, Mountain Ash, Wales.
„ 29	Portsmouth—Repairing Pumps	——	A. Hellard, Town Clerk, Town Hall, Portsmouth.
„ 29	Glasgow—Caisson Gate	Caledonian Railway Company	Sir J. W. Barry, 21 Delahay Street, Westminster.
„ 29	Grangemouth, Scotland—Steel Swing Bridge	Caledonian Railway Company	Sir J. W. Barry, 21 Delahay Street, Westminster.
„ 30	Bury—Extension of Engine and Boiler Houses	Electric Lighting Committee	A. W. Bradley, Borough Engineer and Surveyor, Bury.
„ 30	Gravesend—Plant	Town Council	W. H. Trentham, 39 Victoria Street, Westminster.
„ 31	Whitley—Sewerage Works	Urban District Council	J. P. Spencer, 30 Howard Street, North Shields.
„ 31	Limerick—Steam Road Roller	Borough Council	J. J. Peacocke, Surveyor to the Council, Town Hall, Limerick.
„ 31	Bradford—Electric Tramcars	Corporation	C. J. Spencer, 5 Forster Square, Bradford.
„ 31	Hapton, near Padiham, Lancs—Electric Lighting	——	E. O'Shaughnessy, 16 Hammond Terrace, Padiham.
„ 31	Heanor—Boilers, Pumps, &c., at Waterworks	Urban District Council	J. Holbrook, Surveyor, Heanor.
Aug. 1	Manila—Harbour	——	Commercial Department, Foreign Office, Manila.
„ 1	Roxburgh, Scotland—Boilers, &c.	Lunacy Board	Bertrams, Ltd., St. Katharine's Works, Sciennes, Edinburgh.
„ 1	Kearsley, Lancs—Electric Tramways	Urban District Council	Lacey, Clirehugh & Sillar, 2 Queen Anne's Gate, Westminster.
„ 5	Dundee—Condensing Plant	Gas Commissioners	W. H. Tittensor, Dudhope Crescent Road, Dundee.
„ 5	Campbelltown—Water Supply Works	——	G. Gordon & Co., C.E., Inverness.
„ 5	Brecon—Electric Lighting	Asylum Committee	Giles, Gough & Trollope, 28 Craven Street, Strand, W.C.
„ 8	Leon, Spain—Water Supply	Corporation	Office of the Municipal Works, Leon.
„ 9	Clones—Sewage Disposal Works	Urban District Council	J. H. H. Swiney, Avenue Chambers, Beliast.
„ 10	Hunslet—Settling Tanks, &c.	Rural District Council	C. H. Marriott, Son & Shaw, Dewsbury.
„ 10	Shipston-on-Stour—Water Supply	Rural District Council	N. Lailey, 16 Great George Street, Westminster.
„ 12	Tyldesley—Steel Tank	Urban District Council	Engineer, Gasworks, Tyldesley.
„ 13	Aberdeen—Sewers, &c.	Town Council	W. Dyack, Burgh Surveyor, Town House, Aberdeen.
„ 15	Ipswich—Reservoir	Waterworks Committee	H. Roberts, Engineer and Surveyor of Waterworks, Ipswich.
„ 16	Jassy—Supply of Water to Town	Communal Council	Communal Technical Department, Jassy.
Sept. 2	Amsterdam—Electrical Tram Carriages and Rails	Municipality	Director of the Municipal Tramways, Nieuwe Achtergracht No. 164, Amsterdam.
Oct. 1	Copenhagen—Bridge	——	Statsbaneaulaegenes Köntor, Reventlowsgade, 10 Copenhagen, B.
Dec. 10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.
	IRON AND STEEL:		
July 26	Manchester—Railway	Parks, &c., Committee	City Surveyor's Office, Manchester.
„ 27	Dewsbury—Iron, &c.	Lighting Committee	C. A. Craven, Gasworks, Savile Town, Dewsbury.
„ 31	Oswestry—Iron, bar and sheet, &c.	Cambrian Railways Company	Stores Office, Cambrian Works, Oswastry.
„ 31	Amsterdam—Railway Stores	Netherlands Ministry for the Colonies	M. Nyhoff, Bookseller, The Hague.
„ 31	Sydney, N.S.W.—Rails	——	Agent-General for N.S.W., 9 Victoria Street, Westminster, S.W.
	PAINTING AND PLUMBING:		
July 26	Eccles—Painting	Guardians of the Salford Union	Steward of the Infirmary, Eccles.
„ 26	Iver, Uxbridge—Painting	School Board	W. Garner, Jun., 159 High Street, Uxbridge.
„ 27	Norton-under-Cannock, Staffs—Painting, &c.	Urban District School Board	Teachers, Watling Street School, Norton-under-Cannock.
„ 27	Osmaston-by-Derby—Painting, &c.	School Board	S. F. Antliff, Architect, Draycott.
„ 29	Whittingham—Painting	——	Asylum, Whittingham, Prestou.
„ 30	Castleford—Colouring	School Board	A. Wilson, Clerk to the Board, Castleford.
„ 30	Llansamlet, Wales—Painting, &c.	Higher School Board	R. Llewellyn, Architect, Birchgrove.
„ 31	Oswestry—Paints, Varnish, &c.	Cambrian Railway Company	Stores Office, Cambrian Works, Oswestry.
„ 31	Ashford—Painting	School Board	J. Fraser, 37 High Street, Ashiord.
Aug. 1	Glasgow—Painting	Corporation	Office of Public Works, 64 Cochrane Street, Glasgow.
„ 5	Cleckheaton—Interior Renovation of Church	——	Wesleyan Church, Whitcliffe Road. Cleckheaton.
	ROADS AND CARTAGE:		
July 27	Dundee—Recausewaying	Harbour Trustees	J. Thompson, Junr., Harbour Engineer, Dundee.
„ 28	Lochgelly, Scotland—Granolithic Paving	Town Council	W. Birrell, 200 High Street, Kirkcaldy.
„ 29	Leeds—Tar Macadam	Corporation	City Engineer's Office, Municipal Buildings, Leeds.
„ 29	Shoreham—Paving	Urban District Council	Surveyor, West Street, Shoreham.
„ 30	Sowerby—Culvert	Urban District Council	Surveyor's Office, Town's Buildings, Sowerby Bridge.
„ 30	Brownhills—Stones	Urban District Council	Council's Surveyor, Brownhills.
„ 30	Bootle—Works	Corporation	Borough Engineer's Office, Bootle.
„ 30	London—Formation of Streets	London County Council	Architects' Dept., Housing of the Working Class Branch, 18 Pall Mall East, S.W.
„ 31	Erdington—Street Works	Urban District Council	H. H. Humphries, Public Hall, Erdington, Birmingham.
Aug. 2	Bishop's Stortford—Granite	Urban District Council	T. Swatheridge, Council's Offices, North Street, Bisnop's Stortford.
„ 3	Bexhill—Paving, &c.	Urban District Council	G. Ball, Surveyor, Town Hall, Bexhill.
„ 3	Currickfergus—Stones	Urban Council	Council's Offices, Town Hall, Carrickfergus.
„ 3	Epsom—Road Stone	Urban District Council	Surveyor's Office, Epsom.
„ 3	Windsor—Paving, &c.	Town Council	E. A. Stickland, Borough Surveyor, Alma Road, Windsor.
„ 7	Tamworth—Granite	Rural District Council	Surveyor's Office, Tamworth.
	SANITARY:		
July 26	Caversham—Sewer	Urban District Council	S. P. Andrews, 22 Prospect Street, Caversham.
„ 27	Witham, Essex—Sanitary Works	Metropolitan Asylums Board	Board Offices, Embankment, E.C.
„ 29	East Ardsley—Sewer, &c.	Urban District Council	E. Brooke, Tingley, near Wakefield.
„ 31	Oswestry—Lime	Cambrian Railways Co.	Stores Office, Cambrian Works, Oswestry.
Aug. 1	Macclesfield—Draining, &c.	Parkside Asylum	H. Beswick, Newgate Street, Chester.
„ 1	Hessle—Removal of Refuse	Urban District Council	W. Coulson, Parish Hall, Hessle.
„ 1	Stroud—Sewage Disposal Works	Rural District Council	F. Winterbottom, Clerk, John Street, Stroud.
„ 8	Upton-upon-Severn—Sewers, &c.	Rural District Council	E. B. Marten, Church Street Chambers, Stourbridge.
„ 12	Darfield, Barnsley—Sewerage Works	Urban District Council	Council's Surveyor's Office, The Poplars, Darfield.
	TIMBER:		
July 27	Dewsbury—Wood	Lighting Committee	C. A. Craven, Gasworks, Savile Town, Dewsbury.
„ 31	Oswestry—Timber	Cambrian Railways Co.	Stores Office, Cambrian Works, Oswestry.
„ 31	London, S.E.—Firewood	Guardians of St. Giles	C. S. Stevens, 22 Peckham Road, S.E.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
July 31	Manchester—Fire Station and Police Station	£300, £200 and £100	W. H. Talbot, Town Hall, Manchester.
„ 31	Sheffield—Alteration of Church	——	Rev. T. Houghton, Ecclesall Vicarage, Sheffield.
Aug. 1	Egremont, Cumbrld.—Alteration of Property in Main St.	——	J. Lowery, 59 Main Street, Egremont.
„ 31	Sheffield—Alteration of Ecclesall Church	——	Rev. T. Houghton, Ecclesall Vicarage, Sheffield.
Oct. 1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
No date	Guernsey—School	——	Rev. G. E. Lee, Rector of St. Peter Port.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 9 0	—
Clover, best	per load	4 5 0	5 10 0
Hay, best	do.	4 15 0	5 5 0
Sainfoin mixture ..	do.	4 5 0	5 2 6
Straw	do.	1 8 0	1 18 0

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ..	per cwt.	1 8 0	1 8 7
Colza Oil, English ..	do.	1 6 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 4 6	—
Lead, white, ground, carbonate	do.	1 4 10	—
Do. red	do.	1 0 4½	—
Linseed Oil, barrels ..	do.	1 12 3	1 12 6
Petroleum, American ..	per gal.	0 0 5⅝	0 0 5¾
Do. Russian ..	do.	0 0 4 13/16	0 0 4⅞
Pitch	per barrel	0 7 6	—
Shellac, orange	per cwt.	3 1 6	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Home Melt ..	per cwt.	1 5 3	1 5 6
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	1 6 4½	1 6 7½

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ..	per ton	85 0 0	—
Iron, Staffs., bar ..	do.	6 7 6	8 10 0
Do. Galvanised Corrugated sheet ..	do.	11 5 0	11 10 0
Lead, pig, Spanish ..	do.	12 1 3	—
Do. do. English common brands	do.	12 10 0	—
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17 9 0	—
Do. pipe	do.	18 3 0	—
Nails, cut clasp, 3in. to 6in.	do.	12 0 0	13 5 0
Do. floor brads	do.	11 15 0	12 15 0
Steel, Staffs., Girders and Angles	per ton	5 15 0	6 15 0
Do. Mild Bars	do.	6 15 0	7 1 0
Tin, Foreign	do.	130 0 0	130 10 0
Do. English ingots ..	do.	130 0 0	—
Zinc, sheets, Silesian ..	do.	22 0 0	—
Do. do. Vieille Montaigne	do.	22 10 0	—
Do. Spelter	do.	16 12 6	17 0 0

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel ..	per load	3 0 0	4 0 0
Pine, Quebec Yellow ..	do.	4 7 6	6 0 0
Do. Pitch	per load	2 9 0	3 0 0
Laths, log, Dantzic ..	per fath.	4 10 0	5 10 0
Do. Petersburg ..	per bundle	0 0 9	0 0 10½
Deals, Archangel 2nd & 1st	per P.Std.	8 5 0	11 15 0
Do. do. 4th & 3rd	do.	8 0 0	—
Do. do. unsorted	do.	—	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	21 0 0	—
Do. do. 2nd „	do.	19 0 0	—
Do. do. unsorted	do.	11 0 0	—
Do. do. White	do.	9 10 0	11 5 0
Do. Swedish	do.	9 10 0	18 0 0
Do. White Sea ..	do.	9 15 0	13 0 0
Do. Quebec Pine, 1st ..	do.	22 0 0	23 0 0
Do. do. 2nd ..	do.	19 15 0	—
Do. do. 3rd &c.	do.	13 10 0	—
Do. Canadian Spruce, 1st	do.	12 5 0	—
Do. do. 3rd & 2nd	do.	9 5 0	10 0 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds ..	do.	6 0 0	9 0 0
Flooring Boards, 1in. prepared, 1st ..	per square	0 11 6	0 13 6
Do. 2nd ..	do.	0 9 6	—
Do. 3rd &c. ..	do.	0 6 9	0 7 3

HARD WOODS.

		£ s. d.	£ s. d.
Ash, Quebec	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6

COMING EVENTS.

Monday, July 22, to Saturday, July 27.

ARCHITECTURAL ASSOCIATION.—Annual Excursion.

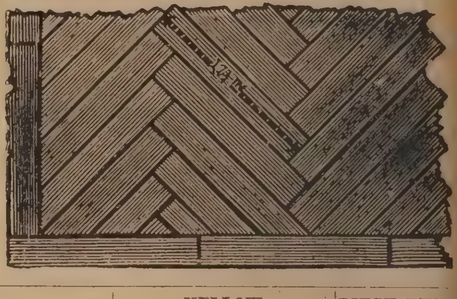
Wednesday, July 24.

ROYAL INSTITUTE OF PUBLIC HEALTH.—Annual Dinner at the Whitehall Rooms. Presentation of Harben Gold Medal to Professor R. Koch, of Berlin.

Thursday, July 25.

ROYAL INSTITUTE OF PUBLIC HEALTH.—Congress opens at Eastbourne.

FLOORING BLOCKS.



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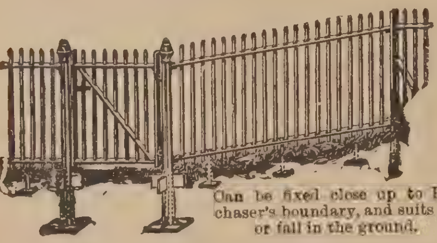

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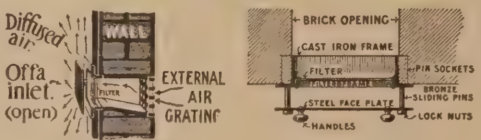

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD

JULY 31, 1901.
No. CCCXXXVIII.

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An Architectural Causerie.

Queen Victoria Memorial.

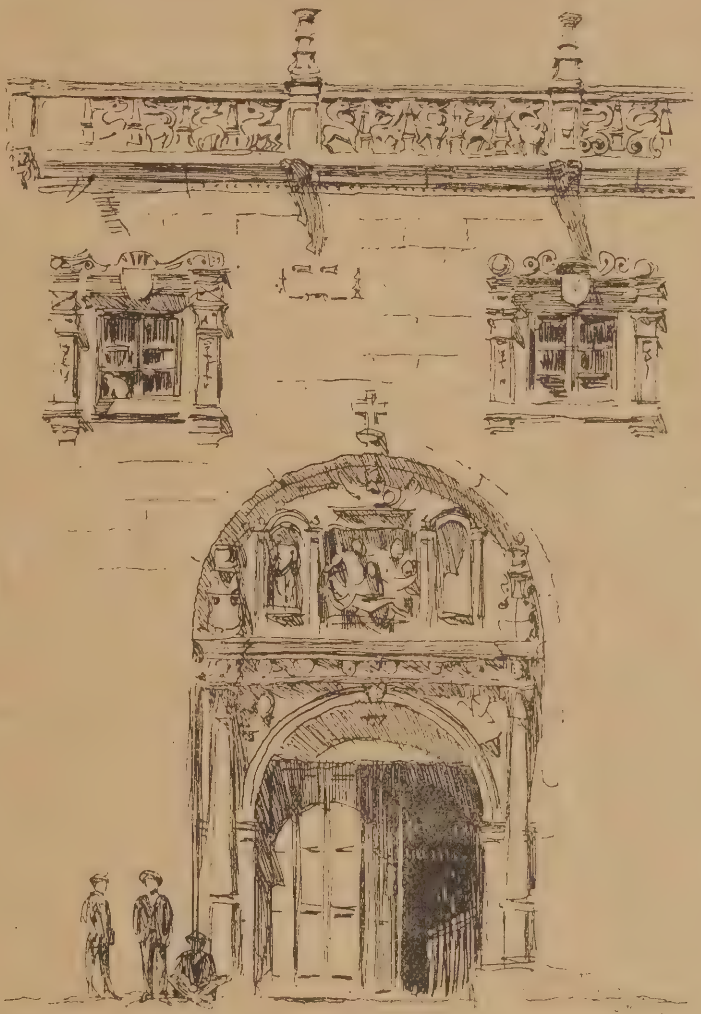
WE are able to publish this week some particulars of the Queen Victoria Memorial as proposed to be erected according to the designs of Mr. Brock and Mr. Aston Webb. From these it is possible to form some idea of the memorial, but as no details are yet settled—both designs being subject to alteration—it is hardly opportune to criticise the scheme. Moreover, before making such a criticism it would be very desirable to see the designs submitted by the remaining four architects. Briefly, the proposal is to replace the railings at present in front of Buckingham Palace by a stone arcade, to bring round the roadway from Constitution Hill to the Mall to a very much wider curve, to throw back the continuance of the Mall to Buckingham Palace Road to the lake, and to build a wall there; and in the "garden" thus enclosed to erect the memorial proper (170ft. by 140ft. by 60ft. high). In addition, the Mall is to be opened out to Charing Cross. It will be noticed that the memorial is to be placed *outside* the stone arcade. This is significant, for it may mean that the Committee think that the commonplace face of the Palace may thus be screened off. But after all this would be a piecemeal method. We have always considered it imperative for the facade to be rebuilt in accord with any memorial adjacent to it. This does not, however, appear to be the view held by the Committee. We respect the official request that no illustrations of the designs should be published at present, but trust that the whole series of designs will soon be exhibited; and also, as soon as the details of the selected design have been finally settled, that these will be made public.

A Spanish Doorway.

THE accompanying illustration of the doorway to the Hospital del Rey at Burgos, from the pen of a masterly architectural draughtsman, is a typical specimen of the Spanish Renaissance. It stands in a courtyard, which itself possesses a most remarkable gateway, and is carried out in stone, the balustrade being pierced and elaborately carved. We would particularly recommend this illustration as a model to those architectural students who endeavour to make their sketches of constructive as well as artistic interest.

An Exhibition of Architectural Photographs.

AT the beginning of the year we had occasion to notice the exhibition of modern illustration organised by the Board of Education in collaboration with the Society of Arts and held in the Indian Section of the Victoria and Albert Museum, Imperial Institute Road. All those excellent drawings are gone, and the walls are now amply covered with about 600 photographs—mainly of architectural interest—which have been gathered together by the same Board. Of these photographs the majority are by the well-known member of Parliament, Sir J. Benjamin Stone, who has long enjoyed the reputation of being an amateur photographer of no mean order. Sir Benjamin has been wandering over the length and breadth of the country with his camera, from the terrace which caused the Premier to pour bitterness on pleasure-loving M.P.s to old-world villages with their quaint personages and customs.



HOSPITAL DEL REY, BURGOS, SPAIN. DRAWN BY A. N. PRENTICE.

There is a photograph of the old Tynwald Court House and House of Keys (now Parr's Bank) at Castletown. Close by on the wall are shown the ball room at Haddon Hall; the "Green Man and Black's Head" Inn at Ashbourne, in Derbyshire, where Boswell stayed in September 1771 and wrote about its ancient signboard; photographs of the Guildhall, the ancient "Falcon Inn" and Shakespeare's schoolroom at Stratford-on-Avon; then the gatehouse of Charlecote (the home of the Lucys) near Stratford, in the garden of which may be seen a curious box-tree ornament in the form of a fleur-de-lis (Shakespeare's flower-de-Luce); next we come to Astley Castle in Warwickshire, once the home of Lady Jane Grey. The old "Lion Hotel" at Dunchurch, where Catesby and the Gunpowder Plot conspirators met after the arrest of Guy Fawkes, is well shown and is worthy of close study—but what abuse to put a telegraph pole at each end of the house! The old rectory at Clifford Chambers, in Gloucestershire, a delightful specimen of English half-timber construction, finds a place in the collection; but perhaps the most interesting feature of the exhibition is the series of photographs (from the National Art Library) of old halls like Wollaton, Arley, Agecroft, Bramhall, &c., &c. Such a series should prove of the greatest interest to all architects and architectural students. It is impracticable for us to enumerate even a tithe of the subjects which are here shown; suffice it to say that their range is catholic and includes the great cathedrals and abbeys, historical houses like "Sparrowe's" at Ipswich, old country churches, and details like the Saxon tympana at Alveston. Moreover, Westminster, the Tower of London and Windsor Castle have received considerable attention, not the least interesting photographs being two taken from Barry's great clock tower, one looking towards Whitehall and the other showing New Scotland Yard and the Embankment. As an architectural photographer Sir Benjamin is perhaps not without deficiencies, and it would perhaps be unfair to consider his work with that of Mr. F. H. Evans; yet he observes all the main requirements and his subjects are of world-wide interest. Altogether the exhibition is a most satisfactory one and we trust that the Board of Education will continue the series which has already proved so eminently successful. The exhibition is open to the public, without charge, every day—on Mondays, Tuesdays and Saturdays from 10 till 10; on Wednesdays, Thursdays and Fridays from 10 till 6; and on Sundays from 2 till dusk.

A Foolish Policy. DOUBTLESS many of our readers observed that last week in the House of Commons Mr. Whitmore asked the First Commissioner of Works whether any definite decision had been come to with regard to the carrying out of the designs of the late Mr. Brydon for the new Government offices in Parliament Street. Mr. Akers-Douglas stated in reply that it has been definitely decided that Mr. Brydon's building should be carried out by the officers of his Department, and that the contracts would be entered into under the supervision of the principal architect and of Sir John Taylor. Thus Mr. Akers-Douglas hopes to effect considerable saving, but this at the expense of the building. In any work of this kind it is the details which give character, and as these remain uncompleted till building operations are in full progress, it follows that in this particular case they cannot be from the hand of the man who designed the building. It was most melancholy and unfortunate that Mr. Brydon should never have lived to see the work completed under his own superintendence, and now that the Government have decided to place matters in the hands of their own officials the case is doubly distressful, for they will never get such a result as that which might have been secured if, on the death of Mr. Brydon, they had given a commission to a leading classical architect. Mr. Akers-Douglas's admission that he hopes to effect a considerable saving exhibits what a short-sighted policy is directing this matter. What a pity that the official mind is so careful of pounds, shillings and pence in matters like this, and so wildly extravagant in other things. It is instructive to read the report, published in another column, of last week's debate in the House of Lords on the subject of a Royal Commission on Art.

THE CHETHAM HOSPITAL, MANCHESTER.

BY F. H. CHEETHAM.

THE history of the growth of Manchester from a fortified enclosure at the junction of two rivers to the present unlovely hive of industry can be read between the covers of a score of books by such as care to turn their pages. To-day few traces of the old town are to be seen except by those who search for them. The two rivers have almost disappeared and have been put to ignoble uses. Where they join one another the Irk has been arched over, and the Irwell bank which used to slope down to the water's edge from the churchyard has been so "improved" in the making of the roadway as to have lost entirely all its original characteristics. Before 1833, when the great changes at Hunt's Bank were commenced, the sloping space between the river and the church was occupied by houses piled tier above tier divided by innumerable alleys and narrow streets. The Old Church itself stands about 40ft. above the Irwell on a kind of platform. A little to the north, at the angle of the junction of the two rivers, is the Chetham Hospital. The two buildings have been intimately connected, as we shall see, but are so no longer. To-day the Old Church is the Cathedral of the diocese of Manchester, and is known to everyone who has visited the city. The Chetham Hospital, now a blue-coat school, hidden from the street as it is by unlovely modern buildings, is little known to strangers, and even among those who are acquainted with the fact of its existence few have ever crossed its threshold. Yet the building is of the greatest interest, and is as well worthy of a visit as many far better known architectural remains in other parts of the country. Its proximity to Victoria and Exchange stations makes it very easy of access to visitors who may have but a short time to spend in Manchester.

A good deal has been written about the Chetham Hospital, but the old stones still hold a secret; for as to the exact date of the present building, as to what parts were first built, and as to when subsequent additions were erected, we can only surmise and admit that there is much room for difference of opinion.

Very briefly the history of the building may be thus told. The site is that of the ancient Barons' Hall, which occupied a defensive position at the junction of the two rivers. The barony of Manchester was founded sometime after the Norman Conquest. The Greslets were its first possessors, and on the death of the last of the line, about 1313, the manor passed to the La Warres. Thomas de la Warre, who was not only baron but also parish priest of Manchester, handed over the care of the parish and its church to a collegiate body in 1421, and gave up his old baronial hall as a residence for its members. Whether any portion of the original Barons' Hall remains in the present building we do not know. It is probable that the place was entirely rebuilt to suit the requirements of the college, for we are told that La Warre before his death in 1426 had spent something like £3,000 on the new building. The style of its architecture corresponds with that of the earliest portions of the church, which were built immediately subsequent to its being collegiated.

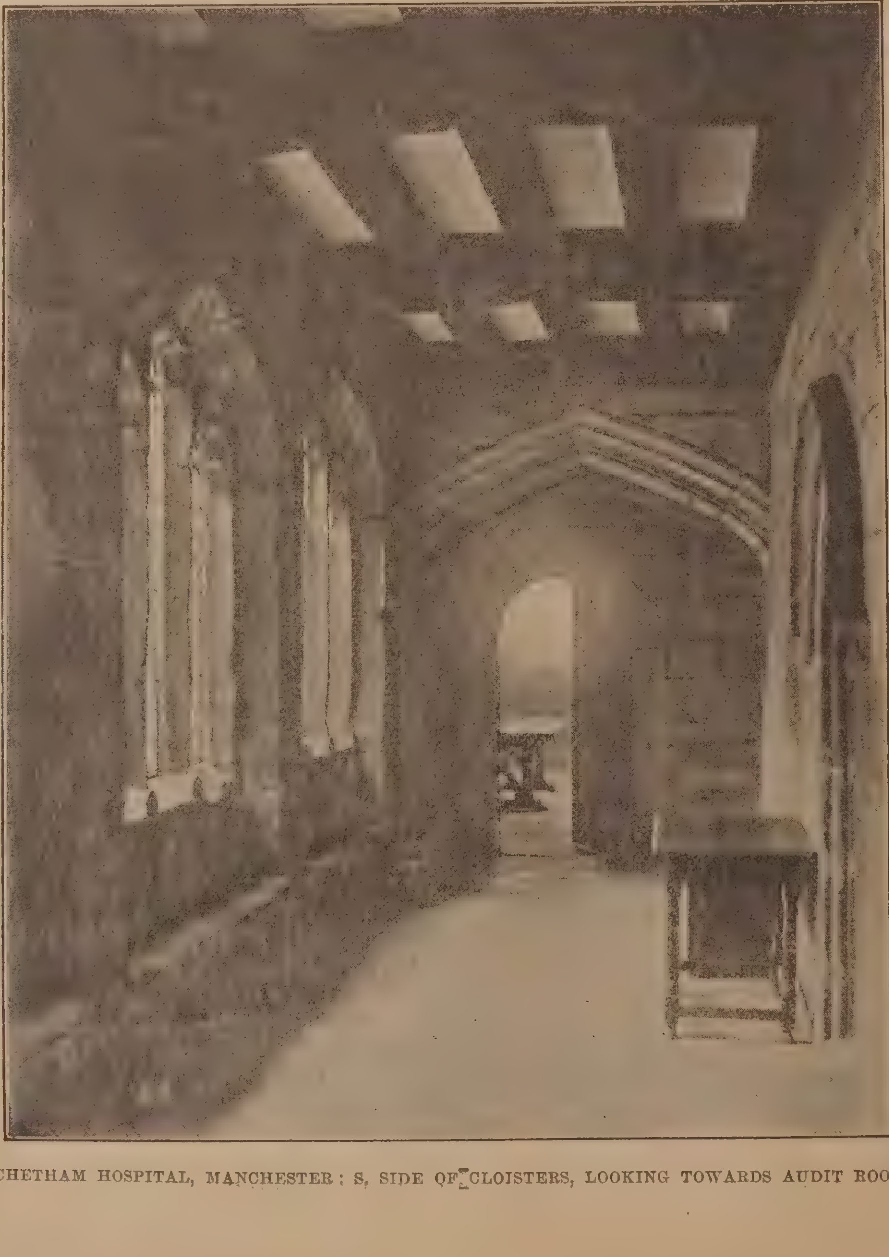
In 1547 the collegiate body was dissolved and the building passed into the hands of the Earls of Derby, in whose possession it remained till the time of the Commonwealth. During the time of their ownership several members of the Stanley family are said to have temporarily lived there. The Derby estates were sequestered at the time of the Civil War, and with them the college at Manchester. The buildings fell into a dilapidated state and were put to all kinds of uses. In this sad condition they fell under the eye of Humphrey Chetham, a Manchester merchant, who conceived the purpose of purchasing them for use as a charity school. He was a philanthropist who had for some years maintained a number of poor boys at his own expense. Applying to the Committee of Sequestration he was met with terms such as he could not accept, and the matter fell through. Chetham died in 1653, but the year following his executors made terms with the committee and bought the college for £500. The boys were transferred there two years later, and there their successors are at the present day. Chetham also left funds for a library, and the Chetham Library is located in the same building, though the two benefactions are kept distinct.

The building has therefore passed through three principal phases of existence—first, as the residence of the collegiate body; second, as the house of the Stanleys, Earls of Derby; and, third, as a school and library.

No doubt the building as it stands to-day was substantially erected in the collegiate days, though probably not all at one time. But it has undergone a good deal of alteration and repair at various times since, which has changed many of its original characteristics, though without taking in any way from its great interest. On the whole, however, it has undergone less change than most buildings of a similar date that remain with us.

The buildings were in such a wretched state after the Civil War that a complete restoration as well as many alterations must have been necessary to fit them for their new purpose by Chetham's executors. There is, however, no record of any alterations of importance during this period. Indeed, here, as in so many places, the stones have to tell their own story, and that is not always easy to read. Many of the documents relating to the earlier history of the college are known to have perished in the Great Fire of London.

The building is L-shaped on plan, with the longer frontage facing north towards the Irk, and the shorter, or west side, facing the Irwell. The west front is now completely hidden from view from the street by shops and a hotel. The north side may, however, be still seen from Walker's Croft. It requires some imagination



CHETHAM HOSPITAL, MANCHESTER: S. SIDE OF CLOISTERS, LOOKING TOWARDS AUDIT ROOM.

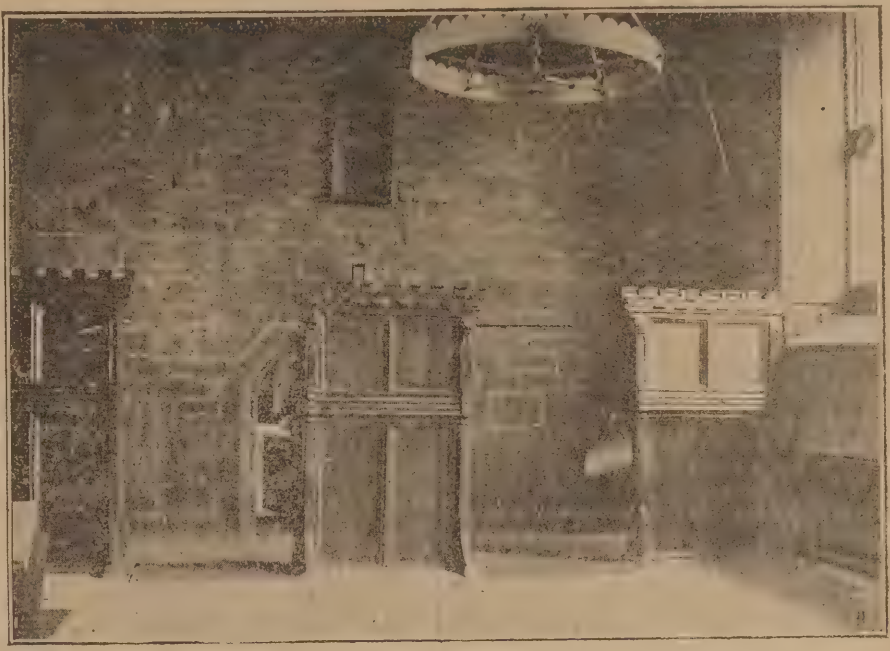
to see it as it would appear originally before the Irk was arched over. Ascending the steps at the end of Walker's Croft you get a glimpse of the river disappearing under the walls of the grammar school building, and you can realise to some extent the height of the old college walls above the stream. There is a drawing by Girton, dated 1797, which shows the college from the north-west angle as it appeared at that time, an engraving of which is among the illustrations of Proctor's "Memorials of Bygone Manchester." In Mr. Henry Taylor's "Old Halls in Lancashire and Cheshire" there is a bird's-eye view of the building from the north "which has been carefully compiled from labouriously made measurements, and from various old drawing and pictures." Mr. Taylor's book contains an admirable architectural description of the Chetham Hospital, and should be read by all who would thoroughly understand the building. There is a copy of the book in the Chetham Library, and seated in the quaint old apartment which is now the reading-room you can see and conjure up from the printed page the history of the centuries long past.

The entrance to the hospital is through a gateway at the corner of Fennel Street immediately north-west of the cathedral. Passing through the door you find yourself in the school playground. On the left is the school-house erected by Mr. Waterhouse in 1878. In front are the old college buildings, which you can enter either by the porch at the internal angle or by the doorway near the library staircase. The library is free to all, but if you want to see the building a fee of 6d. is charged. You are shown over by one of the boys, and if you happen to visit the hospital soon after twelve o'clock you will see the lads at dinner in the great hall. When you have seen the building and perhaps spent an hour or so in the reading-room you feel the old-world influence of the place so strong upon you that it is with something of a shock that you mingle once more with the hurrying crowds in the busy streets of the cotton city. It is difficult to conceive this peaceful restfulness of an age not ours set down, or rather preserved for us, in the very heart of Manchester.

The chief feature of the Chetham Hospital is the cloister court. Round this on three sides were the fellows' rooms, and on the fourth side is the great hall. At the back of the great hall is an apartment now called the audit-room, probably in the old days the private room of the warden. The hall itself is 43ft. long by 24ft. wide, and is lighted on its north side by three large windows. The floor is raised at one end, forming a daïs, and this is surmounted by a fine curved canopy. At the opposite end are the screens, which are solid and massive, and behind these, as usual, are the doorways to the pantry and buttery. The kitchen is, however, hardly where you would expect to find it, access to it being through a porch at the end of the screens. This gives rise to the question whether the present kitchen is, after all, the original one, and many theories have been mooted concerning it. On the west, or cloister side, of the great hall is a large ingle-nook about 11ft. wide and 12ft. deep. This has recently been entirely rebuilt and the position of the fireplace altered. The hall is 22ft. high to the top of the roof, which is open-timbered and in three bays. The ceiling which once disfigured it has been finally removed.

The peculiarity of the cloister is that it is two storeys high, an arrangement which is exceedingly rare. The cloister runs round the north, south and west sides of the quadrangle, which is a very small one, measuring rather less than 40ft. by 20ft. It is generally supposed that this space was originally much larger and that the cloisters were erected subsequently to the rest of this part of the building for the purpose of affording covered communication between the various rooms and offices of the college. In the upper storey a window is placed in each alternate bay only.

The handsome Jacobean staircase in the corner of the quadrangle was probably built after the college came into the hands of the Chetham trustees as a means of access to the library on the first floor. "The door to the cloister yard must have been in the bay now occupied by this stair, as the only present entrance is through one of the windows which has been opened for the purpose."



SCREENS IN GREAT HALL, CHETHAM HOSPITAL, MANCHESTER.

The library is housed in what used to be the fellows' dormitories, and the reading-room is over the audit-room. The partitions were removed between the dormitories so as to form one long L-shaped room, and the narrow windows were enlarged. The old-world charm of the Chetham Library] must be felt rather than described. It is indeed a place to linger in, a true home for the antiquary and the student of ancient lore. The reading-room, as well as the audit-room, is fitted with handsome oak furniture, and is panelled with dark oak wainscot. It has an open-timbered roof, and the ceiling is elaborately vaulted in plaster.

The line of buildings facing north is about 250ft. in length, and consists in its eastern portion of the kitchen, bakehouse, old brewhouse and the ancient hospitium. The kitchen goes the height of two storeys, with an open-timbered roof. The boys' dormitories are near the ancient gatehouse. This gatehouse was formerly the principal entrance to the college, being approached from Old Millgate, then one of the leading streets of Manchester. The new buildings of the Manchester Grammar School now hem in the gatehouse on each side, completely overshadowing it, and an atrocious wood and glass bridge joining the two detached portions of the school actually passes across the face of the ancient gable.

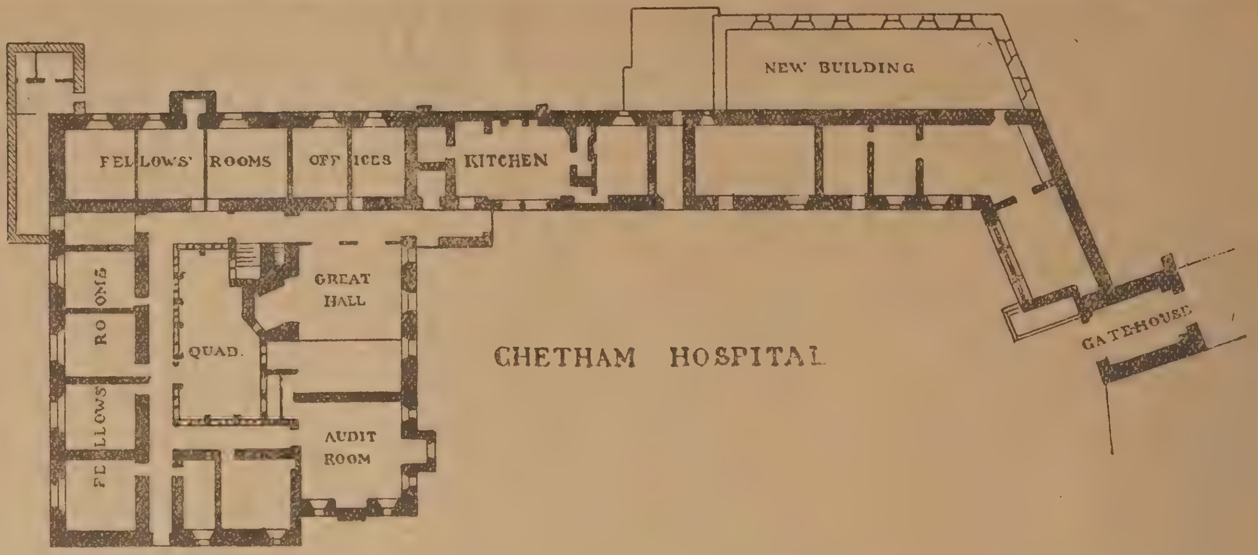
There are indications here and there, more especially in the timber roofs, that portions of the Chetham Hospital belong to a former building, most likely the ancient Barons' Hall. Its massive walls, which are nearly everywhere 3ft. thick, go down a great depth on the western side. They are built with dressed sandstone, and the roofs are covered with stone slabs. There is no wealth of colour. Externally the building can no longer impress, for Manchester has hugged it too tight in her deadly grip. But inside it is different. Unlike many buildings, the Chetham Hospital has gained rather than suffered by restorations. These have been carried out by pious hands, and the inscriptions on our left and right as we enter the building by the library doorway testify to the admirable spirit of nineteenth-century Manchester as well as set forth the nature of the restorations of late years. On the left we read, "Pass not by without bestowing a thought of kindly remembrance upon Oliver Heywood, who of his goodwill did restore the dining hall, reading-room, library, kitchen, dormitories and cloisters between the years 1883-93." On the opposite wall is a tablet recording that Charles James Heywood "completed the work contemplated by Oliver his brother, restoring the ingle-nook, stairs, house, governor's room and other portions of the hospital during the years 1893-5."

A record like this does something to remove from Manchester the stigma fastened on it by Ruskin when he declared that the city was "simply an exponent of a given quantity of national guilt and folly." For those who approach her in a sympathetic spirit Manchester has much to offer of an interest quite other than merely commercial; and if too often the city has "the look of a bad drawing in charcoal which someone has rubbed with his sleeve," that is a quality not belonging to Manchester alone, but which she shares with other and greater cities.

A ROYAL COMMISSION ON ART.

LAST WEEK'S DEBATE IN THE UPPER HOUSE.

LAST week, in the House of Lords, Lord Stanmore moved for the appointment of a Royal Commission similar in character and object to the Fine Art Commission of 1842. The Commission of 1842, his lordship said, owed its origin to the late Prince Consort, who conceived the idea that the building of the new Palace of Westminster might be made instrumental in promoting and improving the fine arts—not only the arts of sculpture and painting, but the fine arts of every kind—in England. Sir Robert Peel, who was then Prime Minister, entered warmly into the project, and the Prince Consort became president of the Commission. The objects of his Royal Highness were three. The first was the promotion and improvement of art generally in England, the second was the supervision and direction of the works of decoration which were to be undertaken in connection with the new Palace of Westminster, and the third, and more in the future, was the conversion of the palace into a sort of supplement to Westminster Abbey, in which there should be pictures of great historial deeds and statues of distinguished men, and that these pictures and statues should be added to from time to time through a long series of generations. The first and second objects met with a fair measure of success during the time the Commission lasted. In December, 1861, the Prince Consort died. His Royal Highness had been the life and soul of the Commission. The Commissioners alleged that they had so completely laid down the course that was to be taken that all that remained to be done was to carry out their programme. Some spasmodic efforts were afterwards made to keep up the work, but from that day to this—for forty years—little of importance had been accomplished. Much that had been done, including some fine pictures, had fallen into decay. He urged that a commission of the same kind as that which sat before, or a committee of some kind, should again be appointed. Of



course, when there was no longer a commission or committee to press the Chancellor of the Exchequer, the latter was only too happy to avoid incurring expenditure. At the time that the Fine Art Commission ceased its labours the next thing which should have engaged attention was the continuance of the decoration of the Royal Gallery, and those of their lordships who had attended the recent trial in that gallery would remember what scope there was for such work. One of the next things that ought to be attended to was St. Stephen's Hall, which had been very much neglected. With regard to his present proposal, he had received a letter from Sir E. J. Poynter expressing the opinion that it could not but be an excellent thing for the encouragement of art of the higher kind. Events had shown that it was impossible to carry on the work desired unless a fixed body were appointed.

Lord Salisbury's Pessimism.

In replying, the Marquis of Salisbury said: I think my noble friend has not considered the peculiar position occupied by the Prince Consort and how far it furnishes the key to the somewhat curious and mysterious history of the artistic efforts of the last sixty years. If it had not been on account of his great influence, of the power he could bring to bear, and of the assistance he could give in all departments of government, I doubt very much whether the Commission would have had the effect which, according to the admission of my noble friend, it has had. He did his best, and he did a great deal. But is the idea of my noble friend practicable that by removing the special machine which, in view of his peculiar position, the Prince invented and worked, we can repeat the same results, or similar results, in a different generation, at a considerable distance of time? I do not believe it. I believe the work of the Commission was the work of the Prince Consort and practically nobody else. My noble friend has dwelt very strongly on the evil results and has carried his investigations so far that he is able to tell us of stains upon various carpets, and he has criticised some wallpaper put up and has declared it to be ugly. I do not know it myself, but of this I am certain—that if the noble lord and his artistic following say it is ugly, we shall find another following ready to say the reverse. But the noble lord thinks things have gone from bad to worse, and he has dwelt on the strange neglect of all First Commissioners of Works who have done nothing to carry on the work of the Commission. But is that an isolated phenomenon? Are you to take it as merely a curious thing to be written in your museum that for forty years the British people and those by whom they were represented took none of those steps in favour of advanced art which my noble friend desires? Surely the more reasonable explanation is that the British people did not care about it. I am afraid that is what my noble friend will find. If some man of the power, position and extraordinary gifts of the Prince Consort were to arise, no doubt many artistic things would be done and many pictures would be commenced; but as soon as the inevitable shortness of human life brought limitation to his efforts, we should again fall into the hopeless difficulties my noble friend speaks of. Some of the observations of my noble friend with respect to things that should be revived and restored, the delicate ironwork which should be wrought, the beautiful carving to be made—these things, however admirable in an artistic dream, are, I am afraid, calculated to cause a cold shudder to the back of a Chancellor of the Exchequer. These things can only be obtained by money. For forty years it has been the opinion of Parliament, as indicated by its action, that the money for these purposes would not be forthcoming—that is to say, that there were other objects preferable to them that claimed expenditure. It seems to me my noble friend has embarked on an enterprise which is certainly hopeless now; and though undoubtedly we can all wish him well in the desire to improve the artistic taste of the country, and especially to improve the building in which we stand, still for everything there is time and opportunity, and I do not think that the present day is the proper opportunity for setting up such a Commission as my noble friend asks for.

Lord Rosebery's Spirited Advocacy.

Lord Rosebery said: I do not rise to support the motion of the noble lord, and I can well understand the reluctance of the noble marquis to entertain it. But I do not altogether sympathise with the reasons the noble marquis has given. The reasons of the noble marquis are, as usual, of a somewhat unexpected character. Another disappointment! He says the Commission would be of a wholly unconstitutional character, and he at once began to draw his familiar warning about the danger of pulling the English Constitution to pieces. Considering that that Commission lasted for eighteen or nineteen years without any violent strain on the Constitution, I am really at a loss to know, unless it be the mere fact of the noble lord's prolonged absence from the country, what constitutes a change in the Constitution that makes the Commission a constitutional peril. Then he said the sum of money the Commission might dispose of would be of an alarming character for the Chancellor of the Exchequer. Well, the old Commission disposed of a fixed sum of £4,000 a year. The noble lord knocked off 50 per cent., and then another 25 per cent., and professed his readiness to undertake the work—for I presume he would be on the Royal Commission if appointed—for the comparatively moderate outlay of £1,000 a year. I think the Government does singularly little for art in this country. On the whole I think that is a good thing. In other States where personal government is more the rule than here, sovereigns are apt to send to the annual exhibitions of art and buy collections of pictures, with which they enrich their palaces and adorn provincial museums. I will not say with what result to the palaces and museums, though I have a strong opinion on the point. I should be sorry to see the noble marquis, followed by a suitable staff, passing through a private view of the Royal Academy, with a marked catalogue in his hand, noting the purchases he intends to make on behalf of the Government. It is no disparagement to his taste to say—I am sure he is convinced of it—that his purchases would be universally criticised by the friends of those whose pictures were not purchased, and that he would create a political situation for himself of a much less enviable kind than that which he new enjoys. What I want to point out is that there would surely be no great difficulty if the National Portrait Gallery were empowered to apply to the Treasury for permission to entrust the execution of a portrait of some great contemporary to some great living artist to enrich the walls of the National Portrait Gallery. If this be not done you have no conceivable chance, except through the patriotism of the individual, and that is not a quantity on which you can always reckon, of obtaining the portraits of great living contemporaries for the national collection. I can hear the objection made to that—"Who is to choose these national portraits?" I would hand over the power to a perfectly impartial and non-political body—the Trustees of the National Portrait Gallery. Without that I think you will have no portraits worthy the name of men living now, because when the portrait of the great man is a success it passes out of your power to obtain it at almost any rate of expenditure.

In the Interests of Architecture.

The Earl of Wemyss said what was wanted in his opinion in this country was a permanent body which should have control over official architectural eccentricities and should put a check on engineering monstrosities, such as they saw in some of their bridges over the Thames. Such a body as he suggested might be composed of the president of the Royal Institute of Architects, the president of the Royal Academy, a professor of architecture, the president of the Institution of Engineers, and a certain number of other persons, including probably the First Commissioner of Works. He thought some body of that kind would be useful, for it would prevent such official eccentricities in the matter of architecture as they had now. He might give a few instances of what he meant. There was Hungerford Bridge straggling across the river spoiling the view of one of the most beautiful structures in the world — Waterloo Bridge. Again, there was that beautiful bridge at Blackfriars, close to which was a hideous railway bridge. If they had a properly constituted artistic body, as he suggested, they would be spared these disfigurements.

Lord Stanmore said he was not quite satisfied with the criticisms of the noble marquis, who had occupied himself in knocking down a house which he had not built. He knew his motion would not be carried on a division, and therefore he would not put their lordships to the trouble of dividing. The motion was negatived without a division.

AN INTERVIEW WITH MR. G. F. WATTS.

A correspondent of "The Daily News" who discussed the matter with Mr. G. F. Watts, R.A., gathered, at the least, such *obiter dicta* as may serve to point a moral and adorn a tale.

Mr. Watts said: "I don't suppose that Lord Salisbury cares an atom about art; he may give an opinion, and there the matter is dismissed. As to his statement with regard to the Commission of 1842, he is undoubtedly right in saying that it was kept alive by the interest and energy of the Prince Consort, and that after the Prince's death its work flickered out. But what then? Lord Salisbury's point, you say, is that the man cannot now be found to renew the work; well, I would suggest, in that case, that every artist of distinction should paint one picture and present it to the nation. For the rest, I don't know that I can suggest anything, except that it would be well if the Government did make some kind of appointment. In France the Government follows a system, but it is confined to historical pictures, which, being only costume pieces, have not the biographical value of portraits. It is this biographical idea which I have attempted to follow in the portraits which I have presented to the National Portrait Gallery; and in that connection I do not think anything could be better than Lord Rosebery's suggestion that the Trustees of the National Portrait Gallery should have the power of applying to the Treasury for permission to entrust the painting of the portrait of a great contemporary to an equally great artist."

The late Sir Frederic Leighton.

This expression of opinion led Mr. Watts into a vain of reminiscent regret. He is, because of the spirit of the times, perhaps, a little pessimistic, and he confesses that in matters artistic he does not exactly believe in anybody. In past days he cherished the hope that Sir Frederic Leighton would be created a peer with the object of fulfilling some such national function in relation to sculpture, painting and architecture as that which was suggested in last week's debate in the House of Lords. Having little faith in committees, for the reason that each man has a different opinion, Mr. Watts believes that Lord Leighton would have been an ideal man for serving the nation in the eclectic sense in matters of art; a man, indeed, whose judgment all could have trusted, and whose high character would have inspired in all other respects the entire confidence of the country.

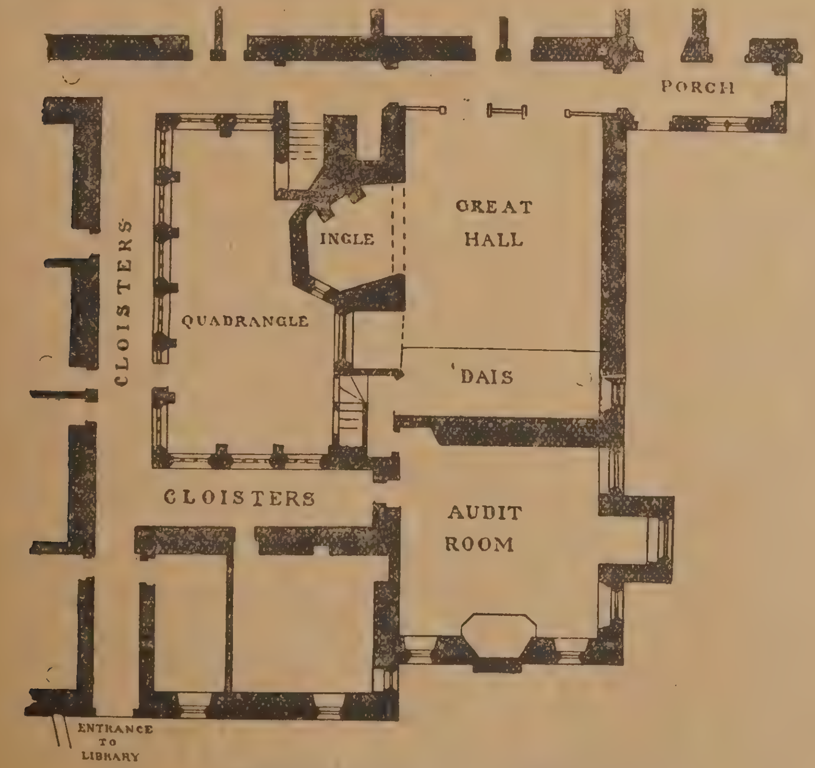
The sum total of Mr. Watts's reflections is that the present generation is not likely to see brought into existence such a Commission on Art as Lord Stanmore suggested. "I don't think you will get enough people to care about it one way or the other," he declared. "Mr. Gladstone might have taken it up, and the late Lord Wantage would have taken a warm interest in it; but for the moment I can think only of Lord Aldenham and Lord Brownlow as likely to be the men for such a movement; both take an interest in art and are quiet capable of forming dispassionate opinions. But in these things we have no patriotism left, and I fear I can offer no practical suggestions if there is no readiness to make a national effort to identify art with the glory and power of the nation."

METAL WORKING AT THE PARIS EXHIBITION.

THE BRITISH JUROR'S REPORT.

A COPY has been sent us of the report by Mr. Bennett H. Brough (secretary of the Iron and Steel Institute) on the exhibits in metal working at the Paris Exhibition of 1900. Mr. Brough (who was the British juror appointed to the International Jury) says: Class 65, *Petite Métallurgie*, dealt for the most part with comparatively small articles universally used, in constant demand, and of special interest in view of their aggregate value, their wide distribution over home and foreign markets, the skill and patience displayed in designing new forms, and the enterprise and expenditure entailed in making changes of plant. Moreover, ample opportunity was afforded British manufacturers of learning useful lessons, for it was impossible for the international jury to give the palm of superiority in this class to the United Kingdom, as was done at the Exhibition of 1851. At that date British hardware of the commoner sort stood unrivalled in its variety, its utility and excellence of workmanship, and in its adaptation to the wants and wishes of every class of purchasers. In 1900, however, France, Germany and the United States successfully competed with Great Britain in these lines. This is notably the case in manufactures which involve tasteful design or ornamentation. Even in the arrangement of the exhibits the lack of taste in the British section was painfully apparent, for with a few notable exceptions the exhibits were not well displayed.

In one branch of the forged iron industry—that of artistic ironwork for architectural purposes—some admirable examples were shown by Starkie Gardner & Co. in the Royal Pavilion. In France this industry is of great antiquity, and some striking seventeenth- and eighteenth-century examples, such as the gates in the Apollo gallery of the Louvre, are familiar to every tourist. Well-selected examples were shown on the retrospective exhibit. The most remarkable forged-iron gate in the Exhibition was that shown by J. Jungfer, in the Hungarian section.



CHETHAM HOSPITAL, MANCHESTER.

The best exhibits of ornamental iron castings were those of A. Durenne, of Paris, of the Kyschtym Ironworks in Russia, which consisted largely of statuettes representing the bronze works of celebrated Russian sculptors and of Deville, Pailliette and Forest of Charleville.

Ironmongery, an industry which in France affords employment to about 90,000 workpeople, was naturally best represented in the French section. The door-plates, handles, locks and fittings of the elegant character traditional in France since the reign of Louis XIV. were conspicuous. There is, however, a tendency to over-ornamentation. Striking novelties in this section were the door-springs shown by Mr. Robert Adams, and the exhibit of the Bostwick Gate and Shutter Co., Ltd. Files made of high-class crucible steel with teeth sharpened by the sand-blast process were shown by J. J. Saville & Co., of Sheffield; tools made from Dannemora steel by Seebohm & Dieckstahl, Ltd., of Sheffield; and hand saws and circular saws by J. Beardshaw & Son, of Sheffield.

Wire ropes, an important branch of manufacture in which British products are pre-eminent, were also included in class 65. The exhibits of George Cradock & Co., of Wakefield, of William Cooke & Co., Ltd., of Sheffield, and of William Smith & Son, of Warrington, well maintained the country's reputation.

Window fastenings were exhibited by a number of Paris firms, and the British articles shown in operation in the Royal Pavilion indicated the ingenuity that has been displayed in simplifying the mechanism.

Many of the locks exhibited were remarkable for ingenuity of principle, and for combinations which seem to render them impregnable. Much progress has been made in this direction on the Continent. The locks shown by Chubb, Needs and other makers are still conspicuous for the merits which public opinion has so long recognised; indeed, there is little fear of Continental locks replacing English ones in Great Britain. No conspicuous success has attended the attempts to introduce the Yale locks with the light keys so popular in America. Moreover, the practice of building operations being under the direction of architects, who stipulate that the fittings must be of certain specified brands, tends to encourage the use of home-made products.

A general review of the contents of class 65 shows that the contributions from France considerably exceed the sum of those from all other countries, and that the character of the contributions seems to indicate that French hardware manufacture has attained a high degree of excellence in workmanship, material, ingenuity and artistic taste. The British contributions, which took the next place in extent, were for the most part thoroughly representative of current practice in various branches of British metallic manufactures. There were, it is true, gaps in the representation of important industries, but of the contributions shown there was little that was not creditable to the country. The United States with forty-four exhibitors, and Germany with only sixteen, afforded little indication of the importance of the hardware industries in those countries.

Extension of Leeds Workhouse.—Proper accommodation is being provided for the large number of tramps who pass through the Leeds Union in the way of new tramp wards. The new buildings, which will cost about £10,000, have been designed by Messrs. T. Winn & Sons, and the principal contractor for the work is Mr. J. T. Wright. The premises are completely separated from the main workhouse buildings, and have an entrance from Gledhow Road. At the entrance are men's and women's shelters, which give access to the respective receiving-rooms and, when necessary, to examination-rooms. Connected with these is an observation-room and an associated-room for the better class of poor women and children. Thirty sleeping cells are provided for the men and twenty stone-breaking cells, and twenty sleeping cells for females, as well as lavatories, bathrooms, &c., and sitting- and living-rooms, and an office for the receiving officer. The buildings will be constructed of brick, with stone dressings, and inside of glazed brick, the floors of the sleeping-cells, &c., being of concrete and the remaining floors of wood-block paving.

QUEEN VICTORIA MEMORIAL.

MR. ASTON WEBB SELECTED.

On Thursday last, at the Foreign Office, a meeting of the general committee of the Queen Victorial Memorial was held for the purpose of considering the recommendations of the executive committee as to the proposed designs. There were present the Earl of Rosebery, Lord George Hamilton, Mr. Balfour, Mr. Chamberlain, Sir Henry Fowler, the Lord Mayor and Viscount Esher (hon. sec.). The following recommendations of the executive committee (Sir E. J. Poynter, P.R.A., Sir L. Alma-Tadema, R.A., Lord Windsor, Viscount Esher, Sir Arthur Ellis, Mr. A. B. Mitford, Mr. Sidney Colvin and Mr. William Emerson, P.R.I.B.A.) were agreed to :—

1. The committee recommend that Mr. Brock's design for the memorial be accepted, subject to such modifications as may be necessitated by the scheme of the memorial as a whole.

2. That Mr. Aston Webb's plan for the general treatment of the space in front of Buckingham Palace be accepted subject to certain necessary changes.

3. The committee further recommend that the consideration of the remainder of the Mall scheme be postponed until the amount of the subscription to the National Memorial has been completed.

In the afternoon, at the invitation of Viscount Esher, a number of representatives of the Press were present at the Foreign Office to examine Mr. Brock's small sketch model of the memorial, and the ground-plan and elevations of Mr. Aston Webb's design for altering the approach to Buckingham Palace. Although certain important changes in detail will be made in Mr. Webb's design, the general idea is settled, and it is undeniably grandiose. The Mall is to be transformed by the simple but very important change, so long desired by every First Commissioner, of cutting an opening into Charing Cross to the north of Drummonds' Bank. The Mall will thus become a great thoroughfare from end to end; a change which, we may hope, will have the practical effect of relieving Pall Mall, and even Piccadilly, of a portion of their traffic. We shall have to pay a price for this convenience, for at least one row of trees must be sacrificed before the proposed two carriage roads, with the great "Processional Road" between them, are complete. Some day, when funds permit, it is intended to place groups of sculpture at two points in the Mall representing (1) Canada and Australia, (2) India and Africa; but the subscriptions to the memorial must be largely increased before this will be possible. What is immediately contemplated is to lay out, immediately in front of the present railings of the Palace, a semicircular space, enclosed by an arcade of stone columns or a grille of wrought iron (the choice has not yet been definitely made), with a wide thoroughfare passing on either side towards Constitution Hill and towards Buckingham Gate. The existing railings having been replaced by something in harmony with the general scheme, the central point will be occupied by the memorial itself, while the remaining space will be laid out as an ornamental garden. The space in front of the Palace has been treated in a broad comprehensive manner by Mr. Webb, who allows for architectural, sculptural and decorative treatment on a generous scale. The first impression the design gives is that of the treatment in front of St. Peter's at Rome, although, of course, it differs very materially. The architect proposes to enlarge the forecourt of the Palace by removing the railings and erecting an arcade about 20ft. further forward. As at present planned, the memorial will be 60ft. high., and will rise from a platform elevated about 8ft. from the ground. The platform itself will be over 100ft. in diameter, and will be flanked by basins into which there will run a copious flow of water. In the centre steps, will lead to the pedestal, the base of a structure of which the effect will be pyramidal, the seated groups below carrying up the eye to the great winged figure of Victory at the summit. Victory, with figures of Constancy and Courage at her feet, stands on the great squared column of Portland stone; and below, facing the Mall, sits the stately figure of the Queen. To the right of the column, looking northwards, is the group representing Justice; to the south, the similar group of Truth; behind is Charity, or Love. Of the ultimate effect of all, these it is of course impossible to speak, for no man can form a final judgment upon so vast an architectural and sculptural group from a small clay sketch measuring, perhaps, 20in. high. But at least one can form an opinion of the ideas meant to be expressed, and of the blocking-out of the design; and, so far as these go, Mr. Brock's plan promises well. The architectural proportions of the memorial, which are artistically quite as important as the sculpture, seem to be admirable, and the whole effect will be greatly helped by the wide platform and its ornaments. This is to be approached by steps guarded by winged lions; a 6ft. wall of bronze will surmount the water on either side, and may perhaps be decorated with friezes illustrating the progress of mankind during the Queen's reign; while in the centre of this wall we shall have on the one side figures representing the Navy and the Army, and, on the other, a similar group to denote Art and Science.

Neither the sculptor, Mr. Brock, nor the architect, Mr. Webb, wishes his scheme to be regarded as in any way complete in detail. The committee also, it will be observed, reserve to themselves the right to make modifications. For that reason Lord Esher made a special request to the representatives of the Press that no sketch of the scheme should be published yet. His lordship further explained that the opening of the Mall into Charing Cross would probably be an accomplished fact within the next year, but that this work would form no part of the memorial scheme. Lord Esher added that something over £130,000 had already been subscribed to the fund, and that the committee had no doubt that a further £50,000 would be raised to enable them to complete the scheme by transforming the Mall.

THE CRACKS IN ST. PAUL'S.

Our readers are doubtless aware of the numerous cracks which have recently been discovered in St. Paul's Cathedral. It now appears that the authorities, realising the critical condition of the edifice, are taking steps to ascertain the precise reason of these cracks, which have been attributed to a number of causes, including the tunnelling of new underground railways. One of the windows in the south transept, and the wall, are in the worst condition. The bars of windows just below the Whispering Gallery are slightly buckled, and underneath are several cracks; while on the corresponding side there are similar fissures, and in addition the cornice beneath has "settled down" at one end. Strong ties have been fixed in the walls on either side, and, as the results of the movements of the building are imperceptible to the naked eye, ties of cement, which stand out about $\frac{1}{4}$in., have been placed across the cracks, so that the slightest movement will cause the cement to break, thus indicating at once the seat of the mischief. These ties of cement are examined at stated intervals, and, if anything wrong appears, steps are taken immediately to put matters right. The walls on the south side contain many cracks, but owing to their slow development it is very difficult to localise them. As showing that the authorities are fully alive to the importance of keeping the cathedral in thorough repair, it may be stated that there are about forty men, representing practically the whole of the building trades, permanently employed in carrying out what may be described as repairing work. These are, of course, in addition to those who are engaged from time to time in executing the larger alterations. The experiment above referred to by way of locating the cause of the cracks is to be followed by further tests.

The Parish Church at High Wycombe, Bucks, is being restored. During recent years the tower, which was erected in the year 1522, has been considerably affected by the weather, and in the course of renovating the external fabric of the historic structure it has been discovered that an expenditure of about £2,000 will be involved to carry out the entire work necessary for the preservation and safety of the tower. The church is a very large one, and is familiarly known as the "Cathedral of Bucks."

THE SEWAGE COMMISSION.

CONCLUSIONS.

Last week the interim report of the Commissioners appointed in 1898 to enquire and report what methods of treating and disposing of sewage may properly be adopted was issued as a Blue-book. The Commissioners arrive at the following conclusions :—

Suitable and Unsuitable Land.

(1) We doubt if any land is entirely useless, but in the case of stiff clay and peat lands the power to purify sewage seems to depend on the depth of the top soil. There are, of course, numerous gradations in the depths of top soil which are met with in nature, and it is not easy to draw the line between lands which contain a sufficient depth to justify their use and lands which do not. We are, however, forced to conclude that peat and stiff clay lands are generally unsuitable for the purification of sewage, that their use for this purpose is always attended with difficulty, and that where the depth of top soil is very small, say 6in. or less, the area of such lands which would be required for efficient purification would in certain cases be so great as to render land treatment impracticable. Further information with regard to this point will be available when our investigation of land treatment is completed.

L.G.B. Rule might be Modified.

(2) After carefully considering, however, the whole of the evidence, together with the results of our own work, we are satisfied that it is practicable to produce by artificial processes alone, either from sewage or from certain mixtures of sewage and trade refuse—such, for example, as are met with at Leeds and Manchester—effluents which will not putrify, which would be classed as good according to ordinary chemical standards, and which might be discharged into a stream without fear of creating a nuisance. We think, therefore, that there are cases in which the Local Government Board would be justified in modifying, under proper safeguards, the present rule as regards the application of sewage to land. No general rule as to what these safeguards should be can be laid down at present, and indeed it will, probably, always be necessary that each case should be considered on its own merits.

The Importance of Protecting the Rivers.

(3) We consider it of the utmost importance that the simplest possible means should be provided for adequately protecting all our rivers, and we are further of opinion that it will be desirable, probably for some time to come, that scientific experiments should be carried on in order to ascertain all the real dangers of pollution, against which they should be protected. In the present state of knowledge, and especially of bacteriology, it is difficult to estimate these dangers with any accuracy, and it seems quite possible that they should be either exaggerated or undervalued according to the predisposition of those who have to deal with them. An authority, guided by medical considerations, might not unnaturally be inclined to insist on a degree of purity which may ultimately prove in certain cases to be uncalled for; while another authority, with its mind fixed upon economy, might shrink from taking essential precautions. It is, perhaps, scarcely for us to say what arrangements should be made, but we are of opinion that the general protection of our rivers is a matter of such grave concern as to demand the creation of a separate Commission, or a new department of the Local Government Board which shall be a Supreme Rivers Authority, dealing with matters relating to rivers and their purification, and which, when appeal is made to them, shall have power to take action in cases where the local authorities have failed to do so.

The report concludes with a reference to the late Sir Richard Thorne, who died at a comparatively early stage of the enquiry. He was a most active member of the Commission, and his advice and help were invaluable.

A New Liberal Club at Neston is being erected in Chester Road.

SURREY ARCHÆOLOGICAL SOCIETY.

VISIT TO WOTTON.

THE Surrey Archæological Society recently visited Wotton. The first stop was made at Wotton Church, where Dr. F. R. Fairbank, F.S.A., read an interesting paper.

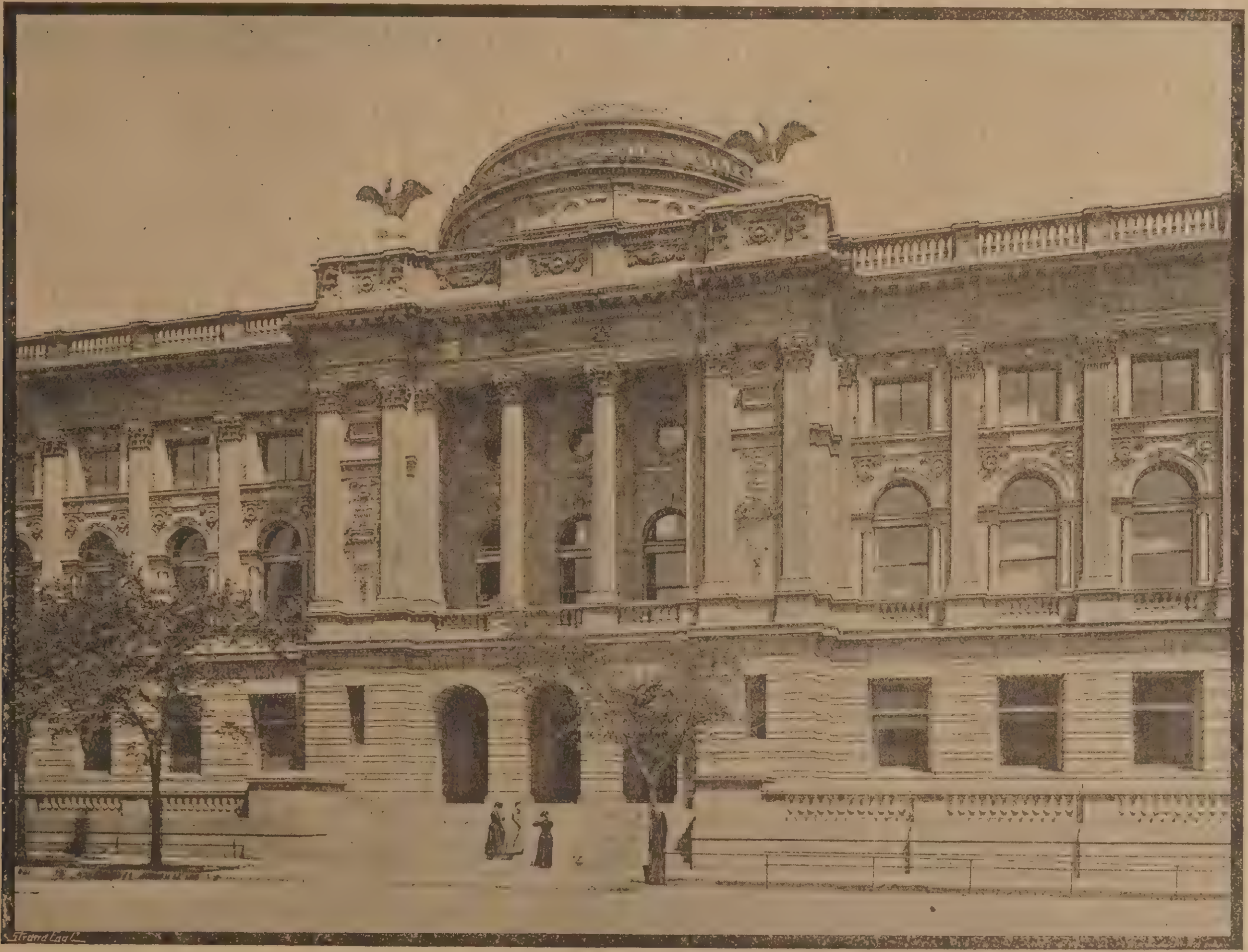
In the Domesday Book, which was the result of the survey made in 1085, the manor of Odestone, or Wotton, is returned as having been held in the time of King Edward the Confessor by one Heraldus, but was then held by Oswald, one of the king's thanes. There is no mention of a church, which is remarkable, as churches are mentioned as existing in most of the neighbouring places, such as Abinger, Shere, Albury, Dorking, Mickleham, Buckland, Betchworth and others. Speaking generally, the non-mention of a church in Domesday is not necessarily a proof that one did not then exist, as no instructions were given to the commissioners to report on the existence of churches. One church only is returned in Cambridgeshire, and none in Lancashire, Cornwall or even Middlesex.

Wotton Church has many points of interest, the tower being the oldest part. It is not square; the width from north to south is greater than the length from east to west. The north, south and east sides appear of the same date, but the west side appears to be later. The eastern arch is exceedingly plain, and the masonry very rough; the stones of which it is built vary in size, some of them being very large, and they are roughly cut. There are no mouldings.

Opinions differ as to the age of this tower. Dr. Fairbank offered the opinion that it is of early Anglo-Norman date and character, or possibly late Saxon. It appears as though originally the eastern wall formed the division between the nave and the chancel, and that the western wall was built afterwards, forming it into a central tower, with chancel and probably apse to the east, a nave to the west, and a doorway to the south. There are now no evidences above ground of this nave. It would be well if some slight examination of the ground were undertaken to endeavour to ascertain its size; this would not be costly, and would not disturb the graves. That was without doubt the form of the church, until, in the thirteenth century, it was re-modelled; the nave was then removed and the western arch of the tower was built up, a small lancet light being inserted in the upper part. The chancel also was removed, and the whole of the new church was built to the east of the tower, much as it now is.

The nave does not present much interest; there is a pair of lancets on the south side, the larger windows are modern insertions, and the walls are much thinner than those of the tower. The large arch across the chancel is modern; on each side of it, in the face of the wall, will be noticed portions of a small arch. Previous to the building of the present arch there was a small one, and indications of others were on each side of it. They are suggestive of an arcade of three arches, which is occasionally found in Norman and Early English churches. There are in the tower three small bells. Two of them are described by Stahlschmidt as of the later part of the fourteenth century; the third bell bears the date 1602. There is no staircase to the tower; this is usual in Norman churches. The font and porch are modern.

After visiting the church the party left for Crossways Farm, which was described by Mr. Ralph Nevill, F.S.A., who pointed out that this building of ornamental brickwork and Bargate stone resembles others of its type in the neighbourhood, and at Godalming and Dorking. It is chiefly interesting because it has been so little altered from its original plan, and not at all for between 200 and 300 years. The house probably dates from 1640; the staircase is part of an older house. The kitchen presents an inglenook fireplace, with an iron fireback showing two heraldic dogs, similar to that in the hall at Wotton.



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Correspondence.

Expression in Architecture.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, N.

SIR,—I should like to add a few remarks to Mr. H. R. Marshall's most excellent article in your last issue. He says "the assumption that the suggestion of the interior uses of a building in the design of its exterior is of the essence of good architecture" is one of the tenets of the architectural realist. I hold that all true architects must concur in this, whether realists or not. He then goes on to say that if it is necessary to express in the façade of a building the purpose for which the interior is used, it follows that we must have representations of pots and pans in the windows of sculleries and of bookplates in those of libraries. Again I cannot agree with him. To do such a thing, to my mind, would be on a par with the prevalent practice among church organists of playing very softly those parts of psalms or hymns which relate to sorrow or death, and those referring to joy or thanksgiving loud; or when mention is made of the sea, or thunder or trumpets, to attempt to imitate the same upon the organ. The first two are to a certain extent excusable and necessary for effect, but there is no excuse for the latter, and a true musician is able to express the idea suitably without necessarily resorting to musical realism. Similarly an architect can express in the façade the idea of a scullery or other menial office by a rather simple treatment. The elevation of a concert hall should be dignified, but graceful and expressive of the beauty of music; that of a smoking-room or library should be more of a cosy and domestic character, expressing comfort, and should lack the stateliness necessary to that of, say, a church or town hall.

Yours truly,
R. FINDON.

HEREFORD NEW MUNICIPAL BUILDINGS COMPETITION.

FORTY-SIX sets of designs were submitted in the competition for new municipal buildings at Hereford. The greater portion of the site for these buildings was given by Mrs. Glinn and the Misses Johnson, and other adjoining property has since been acquired by the Corporation at a cost of £2,550. The frontage to St. Owen Street is about 100ft., and the building will occupy the space between the residences of Dr. Turner and Dr. Morris. The area runs back into East Street, but at present the Percival Hall and other buildings are to remain, the present plans being all self-contained without taking down these buildings. The accommodation required is as follows: Large assembly hall to seat 400 persons, fronting St. Owen Street on first floor, with mayor's parlour, reception-room, two committee-rooms, retiring-room, cloakroom for members, council chamber, waiting-room, offices for the four chief officials and staff, the town clerk, the city surveyor, the city accountant, sanitary department, with all necessary basements, strong rooms, laboratory, photo-room for surveyor's use, stores and a spare suite of rooms: in all making about forty-two rooms. The building generally was to consist as follows: Basement plan, ground floor, first floor, caretaker's quarters and kitchens above.

Three premiums were offered of £100, £75 and £50, which were awarded by the assessor (Mr. Thomas Blashill, F.R.I.B.A., late architect to the London County Council) as follows: (1) Messrs. Macintosh & Newman, High Holborn, W.C.; (2) Mr. H. T. Fowler, Barrow-in-Furness; (3) Messrs. Stanger & Stanger, Wolverhampton. The designs of Mr. Henry A. Cheers, Twickenham; Messrs. Brookes, Son & Godsell, Hereford; and Mr. W. J. Morley & Son, Bradford, were reserved.

The Assessor's Report.

In his report to the Mayor and Corporation Mr. Blashill says: "There is a very great general similarity in the designs; this has resulted from the terms of your instructions, which clearly lay down certain leading features that have commended themselves to you as being best suited to your requirements. This has been of great advantage by concentrating the attention of architects upon those features in which individual thought might well be exercised.

"The object of this competition must be to obtain a building which in plan and general arrangements is suitable for its purpose, and which in external appearance will be dignified and appropriate to its character as the centre of civic administration. It may be wished that these two results could more easily be got from the same design. There are elevations amongst these drawings which would very well fulfil the last-named requirement, but which are combined with plans that are plainly inadmissible. Thus in disregard of your instructions or of good planning the assembly hall is in some cases placed at the rear of the building, and the council chamber or the committee-rooms are put in front, where they will be subject to the noise and dust of the street, or even one storey higher than the instructions or good judgment indicate. There are designs which require improvement in some minor points, which can easily be amended, and in such cases I should not think them disqualified if they are otherwise suitable, particularly as to the general arrangements of the departments and the convenience of the more public rooms.

"I will now deal with the three best designs in detail.

"No. 3 is a design which very fully meets the printed instructions and the general requirements of such a building. The official departments are conveniently placed. The mayor's parlour is in very good communication with the council chamber and the assembly hall. The principal staircase with entrance hall should be enlarged in the direction of the internal lighting area and the entrance made wider. But the author is one of the very few who have provided a good secondary staircase and exit from the assembly hall. This will be necessary in any case, and in most of the designs it could not be got without a considerable revision of the competition plan. Good retiring-rooms are provided for the lecturers or performers in the assembly hall, and good hat and cloak rooms, but such accommodation for officers could be improved. The front elevation is fairly characteristic of a public building, but would be improved by modifications that would probably decrease the cost. The author's estimate at 1s. per ft. cube on 357,512ft. is £17,868. I consider that the measurement will be considerably more, but on the other hand I see no reason to think that the cost per ft. cube will be greater than that of the other designs, the authors of which estimate the cost at 10d. or less. For a fair comparison the same price should be used. I consider that this is the design which in its internal arrangements follows out more closely than any other the instructions issued by the council and the real practical requirements of such a building, and I award to it the first premium of £100.

"No. 10 meets in a somewhat less degree the chief requirements. The allotment of the front rooms on ground floor might have to be somewhat varied, and the arrangement of seats in the council chamber requires reconsideration. I think these fittings should be reversed. The general lavatory arrangements seem insufficient. This plan also provides a second exit with staircase from the assembly hall. The front elevation is less satisfactory than that of the first. The author's estimate at 10d. per ft. cube on 432,776ft. is £18,032. I award to this design the second premium of £75.

"No. 7 is in general suitable as to the arrangement of the departments, but there is no second exit with staircase from the assembly hall, and the lavatory arrangements for the lecturers or performers as well as for general use are insufficient. The front elevation shown as an alternative is good. That shown in the large coloured perspective is also good as a design, but would be very costly, and it is too heavy in appearance for such a building. The author's estimate at 10d. a foot on 408,962 cub. ft., with £950 added for heating and ventilation, is £17,990. I award to this design the third premium of £50.

"I do not consider that by the terms of the competition I am to take full responsibility for these estimates. The council has provided a means by which they are to be tested, and under favourable conditions as to cost of labour and materials the money available may not be insufficient for a plainly finished building.

"Finally, I advise you to enter into communication in the first instance with the author of the first premiated design, with a view to his being appointed the architect to this building, if you can be satisfied as to the points to which I have drawn attention and upon general considerations."

The designs of Mr. H. A. Cheers were favoured by the majority of the municipal buildings committee, and they were practically accepted subject to an interview with the architect, which took place last Friday. It should, however, be stated that the decision is not final until the August meeting of the council, when it will come forward for formal sanction. But this practice of disregarding the assessor's award is much to be deprecated.

THE ACCIDENT TO BROOKLYN BRIDGE.

LAST week, without any warning, seventeen of the heavy girders, or steel cable ropes, which sustain the great Brooklyn Suspension Bridge roadway gave way near the Brooklyn end, allowing the roadway to sag considerably. Others threatened to follow suit, and the police at once cleared and closed the bridge. Engineers say that the accident is due to the excessive weight of a long line of heavy trolley cars, which are stalled at that end of the bridge, and they declare that the structure as a whole is not endangered. The broken girders are the long string-like cables which hang down from the main semicircular suspension cables and are the real supports of the passenger and waggon ways.

The Brooklyn Bridge spans the East River between New York and Brooklyn at a point where the river is about as wide as the Thames at Gravesend. It is the largest suspension bridge in the world, its total length being 5,989ft., or about 1⅛ miles, divided into a central span of 1,595ft. and two land spans of 930ft. each. The towers are 276ft. high, and the four cables which take the stress of suspension are 15¾in. in diameter and composed of 5,000 steel wires each. These are anchored to solid masonry structures on shore, each weighing 60,000 tons, and measuring 119ft. long, 132ft. wide and 90ft. high. The roadway of the bridge, which was finished in 1883, is divided into five avenues. The central one is devoted to foot passengers, the two outer ones to vehicles and the two inner ones to tramcars.

New Patents.

These patents are open to opposition until September 3rd.

1900.—**Sewage Sludge.**—12,124. F. M. Spence & D. D. Spence, both of the Manchester Alum Works, Holland Street, Manchester; H. Spence, Audley House, Broad Road, Sale; and M. Royley, 94, Holland Street, Manchester. The precipitated sludge is treated without any slaked lime. It is heated sufficiently to curdle, which causes it to lose its slimy character, thus rendering it much easier to press.

Lifting Tackle.—15,245. J. Everard, 276, High Street, Waltham Cross, Herts. This invention consists of a toggle link, a pair of gripping jaws, and a suspension yoke carrying a hook. The device is intended to be jammed between two joists, or clamped on one joist, for the purpose of raising loads. The greater the weight the closer the jaws grip the joist.

Domestic Hearths.—15,390. H. B. A. Lillie, 34, Gloucester Road, Regent's Park, N.W. The hearth is made hollow and waste heat is deflected into it.

1901.—**Pipe-making Machines.**—3,824. R. Ames, 116, Loughborough Road, West Bridgford, Nottingham. The core is segmental and is attached to the hanging bolt of the clay cylinder. Its outside shapes the inside of the pipe. As many spaces are left between the segments as there are partitions required. If these are not to continue from end to end, stop pieces are provided.

Pivots for Cupboard Doors.—9,518. E. Klotz and A. Grundmann, Ponitz, near Meerane, Saxony. Wood screws with special heads are used. One has a recess and the other a pin corresponding to it. One is screwed into the door and the other into the frame.

The following specifications were published on Saturday last, and are open to opposition until September 10th. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1900.—6,019, Moore, street lamps. 11,868, Davies, socket-making machines. 11,913, Fage & Hunt, scaffoldings. 12,071, Colbran, gas fittings. 12,157, Youlten, process for impregnating wood and other fibrous substances. 12,186, Adams, automatic filling and discharging apparatus for sewage purification works. 13,615, Allott & Jones, apparatus for use in copying tracings by artificial light. 14,016, Spence, apparatus for holding doors in a partly open or open position. 14,476, Crouch, window fasteners. 15,030, Bloxam (*Pholox-Glühlicht-Gesellschaft mit beschränkter Haftung*), incandescent gas mantles. 15,432, Gibb, manufacture of Portland cement. 15,446, Mouchel, walls, partitions, slabs, &c. 15,453, Pitsch, fireproof floor or ceiling. 15,561, Oates, street gulleys. 15,720, Bayer, sewage treatment. 15,790, Hannent, means for glazing greenhouses and other structures. 15,853, Bell & Bell, operating mechanism of frictionally-driven cranes. 15,910, Gardner, crushing, grinding and dressing or sifting machine. 15,996, Fickling, means for consuming smoke in the furnaces of steam boilers.

1901.—4,370, Etrich, pavements for tennis and other grounds. 6,588, Roberts & Severn, sash-fasteners. 7,467, Safford, heat-radiators. 8,168, Meldrum, memorial tablets. 8,372, Haddan (*Adams & Westlake Co.*), acetylene generators. 8,691, Boenke, fireproof artificial stone blocks. 9,607, Green, metal roofing. 9,650, Schmidt, contrivances for lighting purposes. 9,830, Quester, construction of armoured walls for safes. 9,919, Stone, wire cables, lightning rods, &c. 10,406, Smith, apparatus for decorating woodwork. 11,128, Rotermundt, sliding doors. 11,152, Hildmann, vices. 11,345, Newton (*New Jersey Wire Cloth Co.*), fireproof construction.

THE GUINNESS TRUST BUILDINGS.

TOWARDS the close of 1889 Sir Edward C. Guinness, now Lord Iveagh, placed in the hands of trustees £250,000 for the purpose of providing, at low rents, healthy and commodious dwellings for the more necessitous class of wage-earners. Of this sum £200,000 was to be expended in London and £50,000 in Dublin. The first trustees were Lord Rowton, who has acted as chairman ever since, Mr. D. R. Plunkett, now Lord Rathmore, and Mr. C. T. Ritchie, the present Home Secretary. Later on, as the operations of the trust increased, Lord Iveagh, Mr. J. Lunard Pattisson, Colonel G. W. Addison, and the Hon. Rupert Guinness were appointed additional trustees. During the twelve years of its existence the Guinness Trust has (independently of its Dublin work) erected eight large groups of dwellings, which will, when the eighth is completely tenanted, house 2,517 families upon eight freehold sites in the most populous districts of London at a total outlay of over £450,000.

The greater part of the eighth group of buildings, situate in Fulham Palace Road, Hammersmith, was opened last week. These buildings, erected from the designs of Messrs. N. S. Joseph, Son & Smithem, may be considered typical of the Guinness dwellings generally, though they are rather more spacious and commodious than those erected in the early days of the trust. The four great blocks of dwellings already built (and there are three smaller ones yet to be added) comprise eight separate buildings, and these blocks are divided by roads and playgrounds of very ample dimensions, the open spaces amounting to an aggregate of nearly an acre.

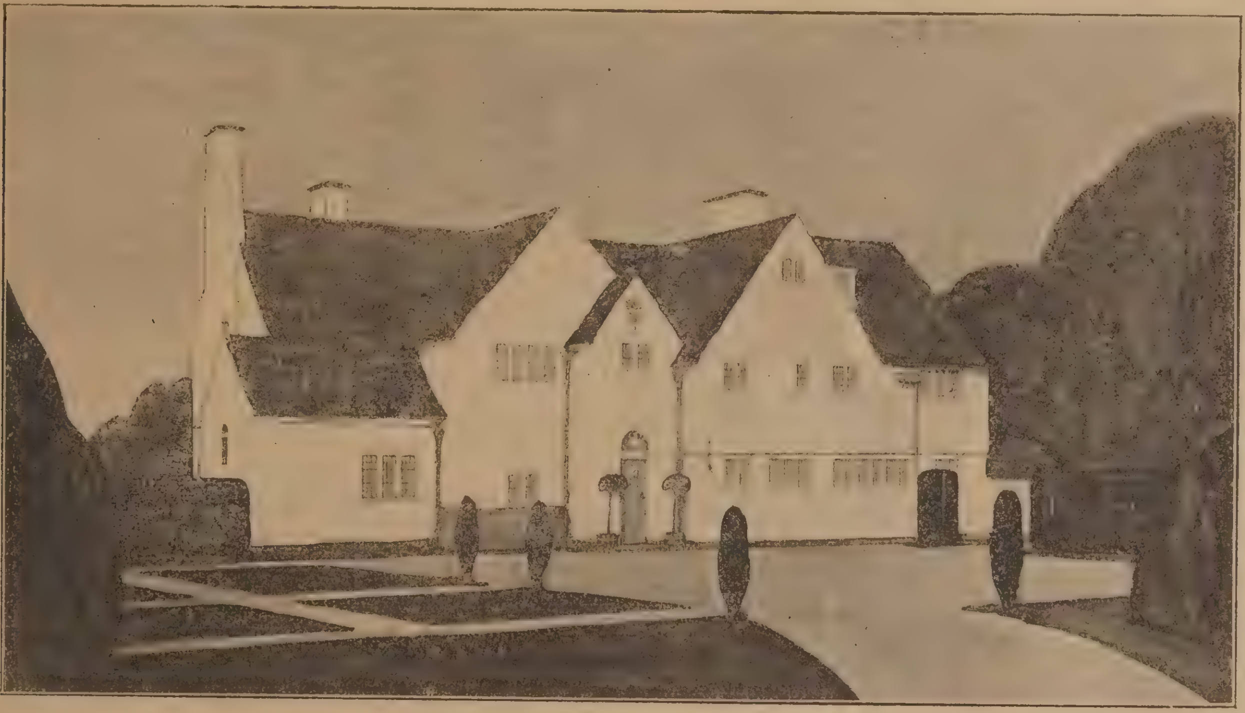
Passing along the broad landings, the visitor soon discovers that there is the usual choice of tenements with either one, two or three rooms each. In the front block there are a few with four rooms for exceptionally large families. The living rooms have a carpet-area of about 150ft.; the bedrooms, where there are two, have each an area of 100ft., and where there is only one bedroom to a tenement its area is 126ft. The rooms are all supplied with fittings. Every window of a Guinness dwelling is fitted with Venetian blinds of the strongest kind. Each living room has a fitment presenting a triple combination of coal bunk, store for cooking utensils, and food cupboard, the latter ventilated into the outer air; and as each living room serves the purpose of a kitchen, it is fitted with a close range of a specially economical kind. The laundries on each landing which are used in common by the tenants of each floor are so apportioned that each housewife has the sole use of a laundry for one day in the week, holding the key for the day, so that her property is safe from the possibility of depredation. Each laundry is fitted with two washing troughs, copper, and drying lines.

In separate buildings, placed in a central position, hot and cold baths are available for the free use of the tenants and their families every evening. In addition to this, each head of a family has the free use of a club room in the evenings and on Sundays. The club room is well heated and lighted by electricity, and is kept supplied with papers, books, and games. The housewife has the use of a drying room in which a high temperature is permanently maintained. But, perhaps, the greatest of the extra boons conferred on the Guinness tenants is the free use of the urn rooms, in which hot water is dispensed at breakfast time and tea time at absolutely boiling point, so enabling the working man to get his hot coffee before he goes to work, and also enabling the housewife to save a good deal of coal in the summer, as she needs no fire for boiling her kettle for the all-important evening meal.

The rents charged are—for a one-room tenement, 3s. 6d. to 3s. 3d. per week, according to position; for a two-room tenement, 4s. 3d. to 5s. 6d.; for a three-room tenement, 5s. to 6s. 3d. Upon the basis of those rents there is, after paying all outgoings, a nett return of 3½ per cent., which, subject to setting aside a reasonable annual sum for a sinking fund, is available for further building operations. These figures are derived from the past experience of the trust as set forth in its published reports.

The report of the trustees for 1900 answers the question whether the right class of tenants find their way into their dwellings. Lord Iveagh originally expressed the desire that none earning more than £1 a week should be accepted as tenants. Owing to the general rise in wages that limit has now been somewhat increased; but the statistics of 1900 show that of the 2,210 families at that time housed in the Guinness dwellings the average weekly earnings of each tenant (including, so far as could be ascertained those of his family) was £1 0s. 1½d. The average weekly rent of each room was 2s. 1½d.

The Hospital of St. John and St. Elizabeth at Grove End Road, St. John's Wood, was opened recently.



THE CHAPLAIN'S HOUSE, ST. MARY'S HOME, WANTAGE. M. H. BAILLIE SCOTT, ARCHITECT.

ARCHITECTURAL EXHIBITS AT THE PARIS EXHIBITION.

Mr. Ernest George's Report.

IN his report on the architectural exhibits at the Paris Exhibition of 1900, Mr. Ernest George (one of the representatives of Great Britain on the International Jury) says:

"It was disappointing to find the contribution of architectural drawings from Great Britain to be small, and to consist for the most part of unimportant works, not fairly representing British art. The list of exhibitors contains but thirty-six names, and in this list several of our leading architects are not to be found, while one or two men have sent drawings hardly supporting their deserved reputation.

"Our exhibited drawings are mostly examples of domestic buildings, and our foreign critics give us higher praise for this branch of work than for our civic or public buildings. Architecture is less erratic and more traditional in France than in England, but when a Frenchman forsakes his classical lines there is commonly less restraint and propriety and less of a pleasant homeliness than in our own country work. The English country house has more comeliness and comfort than the average *maison de campagne*.

"An architectural exhibition will never claim public interest as will exhibitions of the sister arts. The painter and sculptor show their completed works, while the architect's buildings are only explained by diagrams, and it is undesirable that these drawings should become pretty pictures or works of art in themselves.

Great Britain.

"In the group of Great Britain there are mostly line drawing, while in the United States adjoining it is interesting to find architecture represented only by photographs of executed works. These, while making a modest display, seem to us to make the most reliable statement of the present position of architecture in America.

Germany.

"The German architectural exhibits are few, but they represent municipal buildings and churches drawn and coloured to a large scale and handsomely framed, as if the picture, rather than the building, were the ultimate end.

France.

"France presents many works of interest; there is much art in the tinting of the drawings, which are frequently on a grand scale. There are many archæological studies working out the problem of restoring ancient cities or temples, reconstructing them from the fragments still to be found. These show a deep and patient research into ancient art that is hardly practised with us, our training being of a more limited and utilitarian character.

"Our own students have given equally close study to mediæval examples, the Early Renaissance and to subsequent styles, and I venture to think that in our revival or adaptation of the French, the Flemish, or particularly the Dutch types, our own application or reproduction of these is more satisfactory than the prevailing modern work in the countries that gave birth to these styles. I believe that from our best hands the spirit and refinement of the old work is often attained, which in Continental modern work is so frequently missed."

Although the British exhibit, as a whole, did not reflect the highest level to which the arts have attained in this country, it was generally admitted to be the best of the foreign sections. More medals were awarded to the British than to any other foreign section.

Bricks and Mortar.

APHORISM FOR THE WEEK.

He that builds a fair house upon an ill seat committeth himself to prison.—FRANCIS BACON.

Our Plates. THE New Radcliffe Library at Oxford has been built by the Drapers' Company at a cost of over £21,000 and given to the university. The architect was Mr. T. G. Jackson, R.A. It forms a projecting wing of the museum, with which its Renaissance architecture is in strong but not unpleasing contrast. It consists of two upper rooms about 80ft. in length, fitted up as libraries with all accommodation for readers, as well as a basement for the storage of books. There is room, it is calculated, to serve for the accumulations of a century to come.—In the design of the Ryks Museum at Amsterdam, by Dr. J. P. H. Cuypers, the question of adequate lighting was of first importance, and in order to determine which system would be best an experiment was made with a temporary wooden building.

Art in the East End. IN opening an Exhibition of Chinese Art at the Whitechapel Art Gallery last week Mr. Asquith made an allusion to the increase of artistic appreciation among the inhabitants of East London. He recalled his association with the earlier work of the Toynbee Hall Settlement, with the members of which the inception of art exhibitions in the East End originated. The scheme, Mr. Asquith said, met with some discouragement from sceptical critics, but for once the dreamers and idealists won a decisive victory over the practical men, and the exhibitions became an annual feature. During recent years, Mr. Asquith proceeded, a great and widespread decentralisation had taken place in relation to art collections, and exhibits which formerly were aggregated in the great national galleries had now become distributed among the great centres of population. The experiment they were that day initiating was one of a very interesting kind, for it was a most happy ideal that from time to time the trustees of the Whitechapel Art Gallery would concentrate themselves upon an attempt to reproduce some period, country or trade. A very opportune choice had been made in the selection of China as the subject of the present exhibition. Over 200,000 people had visited the gallery since its opening in April last.

The Working Men's College. THE Working Men's College in Great Ormond Street, to the building fund of which several City companies have just made special grants, was in bygone years an object of interest to a great many prominent persons in the world of art. In its earliest days, in the autumn of 1854, Ruskin volunteered to direct a drawing class, which he taught for some time single-handed. Writing to Charles Kingsley a few months afterwards, F. D. Maurice, to whom the college owed its foundation, says that Ruskin was "doing capitally" with the drawing class, but the work soon proved too much for that accomplished amateur. Ruskin thereon looked about for a professional assistant, and found one in the person of a struggling young artist, who was, however, destined to be famous later on. The young artist was no less a person than Dante Gabriel Rossetti, who worked with Ruskin until 1858, when his place was taken by another artist whose peculiar talents had not at that time received proper recognition, Ford Madox Brown. But Rossetti did not altogether sever his connection with the Working Men's College, for he was still teaching there in the evenings at the time of his wife's tragic death in 1862. Rossetti, who two years before had married the beautiful and gifted Miss Siddal, the original of Millais's "Ophelia," took his wife on the evening of the 10th of February to dine at an hotel near Leicester Square in company with Mr. Swinburne. After dinner he escorted her back to their house in Chatham Place, and then went out to his work at the drawing class. Rossetti was late in returning from the Working Men's College, and when he reached home he found the house in darkness. He had "to grope for a light," and called his wife's name in vain. Mrs. Rossetti, who suffered greatly from neuralgia, had taken an overdose of laudanum, and though her husband called in four doctors, among whom, curiously enough, was Mr. John Marshall, afterwards Professor of Anatomy at the Royal Academy, she never regained consciousness, but died in a few hours. Rossetti and Madox Brown were not the only artists who taught at the Working Men's College, for the fortunate students in the evening classes received instruction subsequently from Burne-Jones, Arthur Hughes, Val Prinsep, Stacy Marks, Woolner and Lowes Dickinson.

Edinburgh County Buildings Portico. AT a recent meeting of the council of the Edinburgh Architectural Association—Mr. Henry F. Kerr, A.R.I.B.A., president, in the chair—the immediately impending demolition of the Ionic portico to Parliament Square was under consideration. This portico was designed nearly a century ago by Elliott, and is in great part a transcript of the famous portico of the Erechtheum at Athens. It is undoubtedly a fine work and of commanding scale, and as an example of the Ionic order in its richest development is of great importance. The base and the entablature have original features of individual interest and value. Perhaps the excellence of its design and the beauty of its material and masonry would have been more generally appreciated had it faced another aspect than the east, where the due effect of light and shade from the sunlight can only fully be seen in the early morning. The council of the Association, fully acknowledging the merit of this piece of architecture—one of the very few remaining works of such scale and excellence—unanimously resolved to express its deep regret at the possibility of its being lost to the city of Edinburgh, and its earnest hope that in some way it may yet be saved. Assuming that the portico cannot be retained in its present position, the council is of opinion that within the confines of the municipality a place and a use could be found for it, so that it may continue to be an ornament of the city. The council is strongly of opinion that the destruction of this noble portico would be not only a civic but to a great degree a national loss, and in this age of consideration for all things worthy of repute it would be an irretrievable disgrace if the stones were allowed to be broken up.

Leather for Bookbinding. THE Society of Arts has just issued the report of a committee appointed by it in February, 1900, to investigate the durability of the leathers now used for bookbinding. The sub-committee came to the conclusion that the complaints as to the deterioration of modern leather are quite justifiable. With regard to the conditions under which books are kept, the committee noted the injurious effects of direct sunlight, gas and tobacco smoke, and observed that books kept in cases with closely-fitting doors were generally in the best preservation. As to the suitability of various leathers, the committee reports that of the old leathers (fifteenth and sixteenth century) white pigskin, old brown calf, vellum and red morocco have lasted best. It considers that a pure sumach tannage will provide a good and durable leather, and makes some detailed recommendations as to the binding of books. An extensive series of experiments have been carried out with the view of determining the causes of the decay of bindings. This decay was found to be partly caused by want of ventilation and improper heating and lighting of libraries, and partly by mistakes on the part of leather manufacturers and bookbinders in the earlier stages of leather preparation. The committee condemns the use of tanning materials belonging to the catechol group, and pronounces the practice of embossing leather to imitate a grain and the use of mineral acids to brighten colour extremely injurious. It recommends the use of glass of a slight yellow or olive tint for library windows, so as to exclude as far as possible the more chemically active sunrays.

Northumberland Handicrafts. AN exhibition, which is intended to become an annual event, was opened recently at the Academy of Arts, Newcastle, in connection with the Northumberland Handicrafts Guild. About three hundred articles were shown in the competitive classes, these being made up of woodcarving and embroidery. They were the work of the students in local centres affiliated to the guild and individual exhibitors who might not be associated. Mr. George Frampton, A.R.A., and Mr. Godfrey Blount were the judges, and in making their awards they took the following into consideration: (a) Skill in handicraft reproduction of a copied design; (b) skill in handicraft reproduction of a copied design selected and applied to the decoration of some particular object; (c) original designs applied to the decoration of an object; (d) objects constructed and decorated by the exhibitor from his own designs. A silver shield to be held for one year by the local centre submitting the exhibit which presented the best general quality of work, which had been presented by Mr. Watson-Armstrong, was awarded to Lucker. There were two other sections in the exhibition, one consisting of articles from handicraft schools and kindred agencies in different parts of the country, and the other specimens—old and modern—lent by members of the guild and others, including the Board of Education, South Kensington.

The Late Mr. Hay. THE death occurred recently at West Kirby of Mr. William Hardy Hay, of the firm of Messrs. W. & J. Hay, architects, Liverpool, the deceased gentleman having attained the ripe old age of eighty-seven. Mr. Hay, who retired from business some years ago, had been in failing health for a considerable time, and had been lately confined to his room owing to bronchitis. He was one of the oldest architects in Liverpool, and there are not a few architects in the city who received their training in his office, notably Mr. James Doyle, the late Mr. David Walker and Mr. William Parslow, Dale Street. In addition to a vast amount of ordinary work, Mr. Hay was the architect for a considerable number of churches, especially in Scotland, besides others in Liverpool and in the Birkenhead district, earning a wide reputation as an ecclesiastical architect. Formerly the firm carried on business under the style of J. W. & J. Hay, and was then regarded in the profession as one of the principal, if not the principal, firms for church architecture in the North of England as well as in Scotland. In the early revival of Gothic architecture the firm took a decided lead, making greater strides in this branch than any other firm in the North. Some idea of the magnitude of their work may be gathered from the fact that they have been known to have at one time plans in preparation for no fewer than thirty churches, schools, academies, and the like, which necessitated the employment of a large staff. On the death of Mr. John Hay the style of the firm was altered to that of W. & J. Hay, the only surviving brother now being Mr. James, who, like the deceased, has been out of business for a number of years, being well advanced in years. Whilst Mr. William was eminent as an architect in the Classical style, his two brothers were equally minent in the Gothic style.

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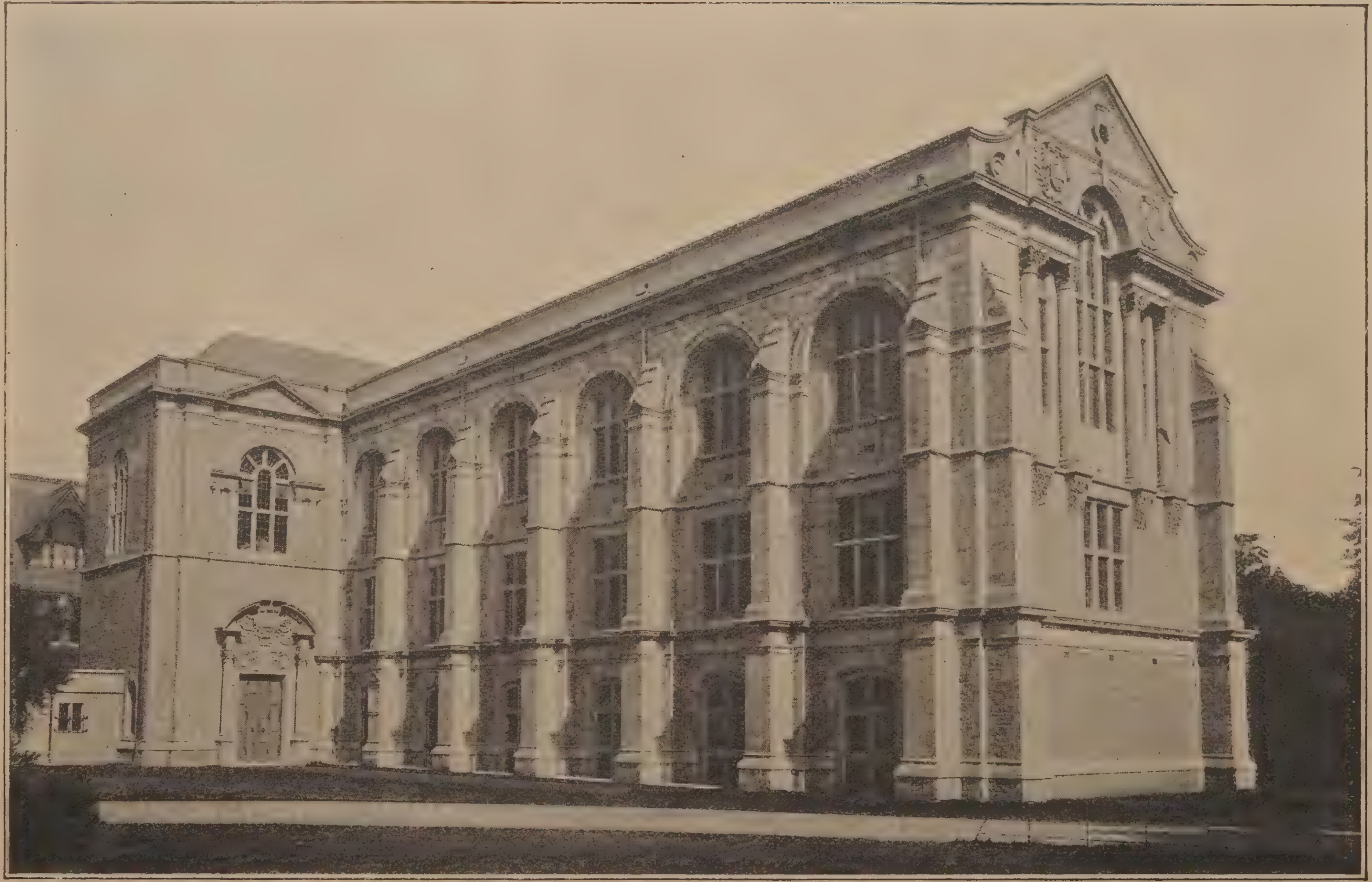

Photo by Henry W. Taunt & Co.

THE NEW RADCLIFFE LIBRARY, OXFORD UNIVERSITY. T. G. JACKSON, R.A., Architect.

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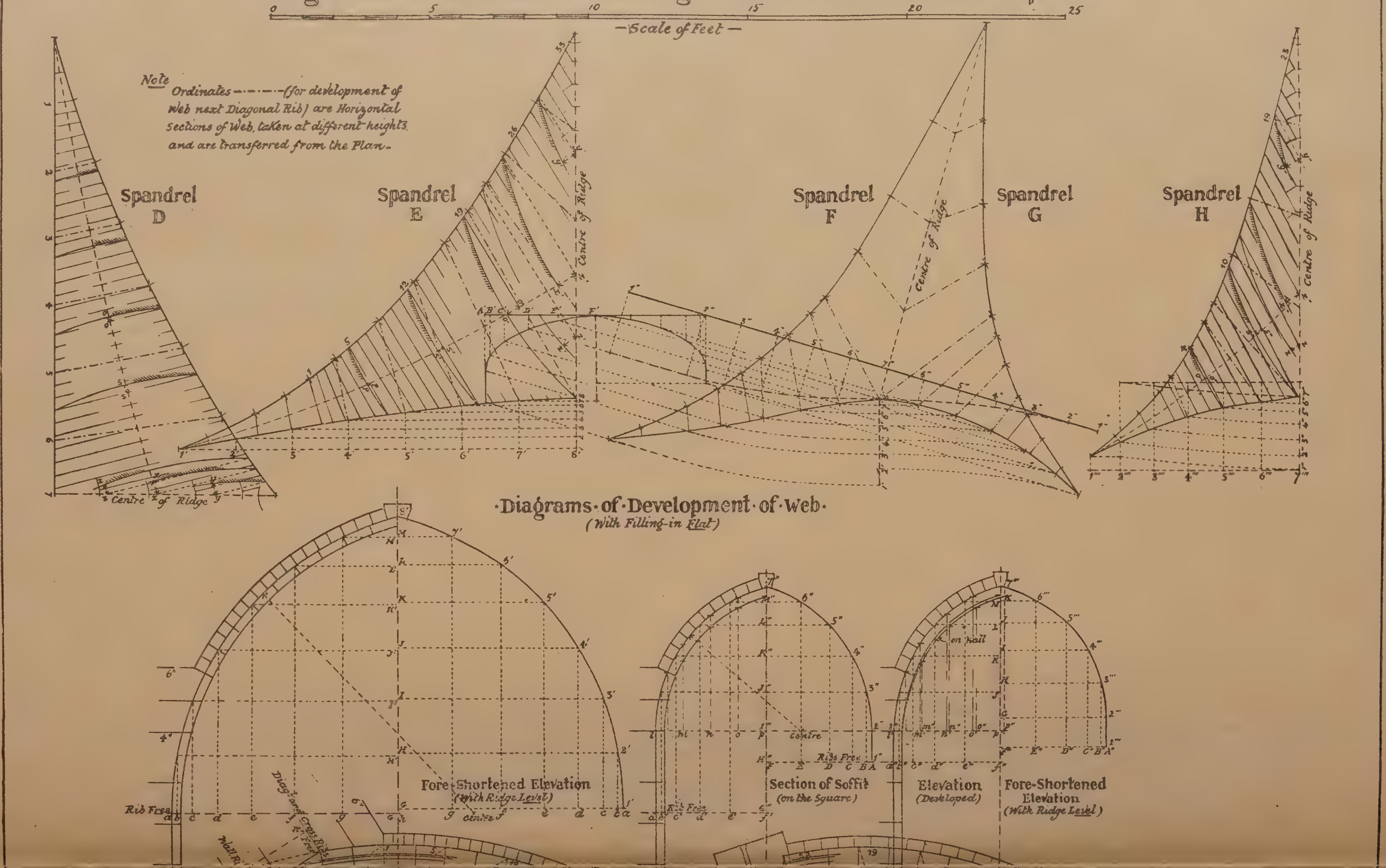
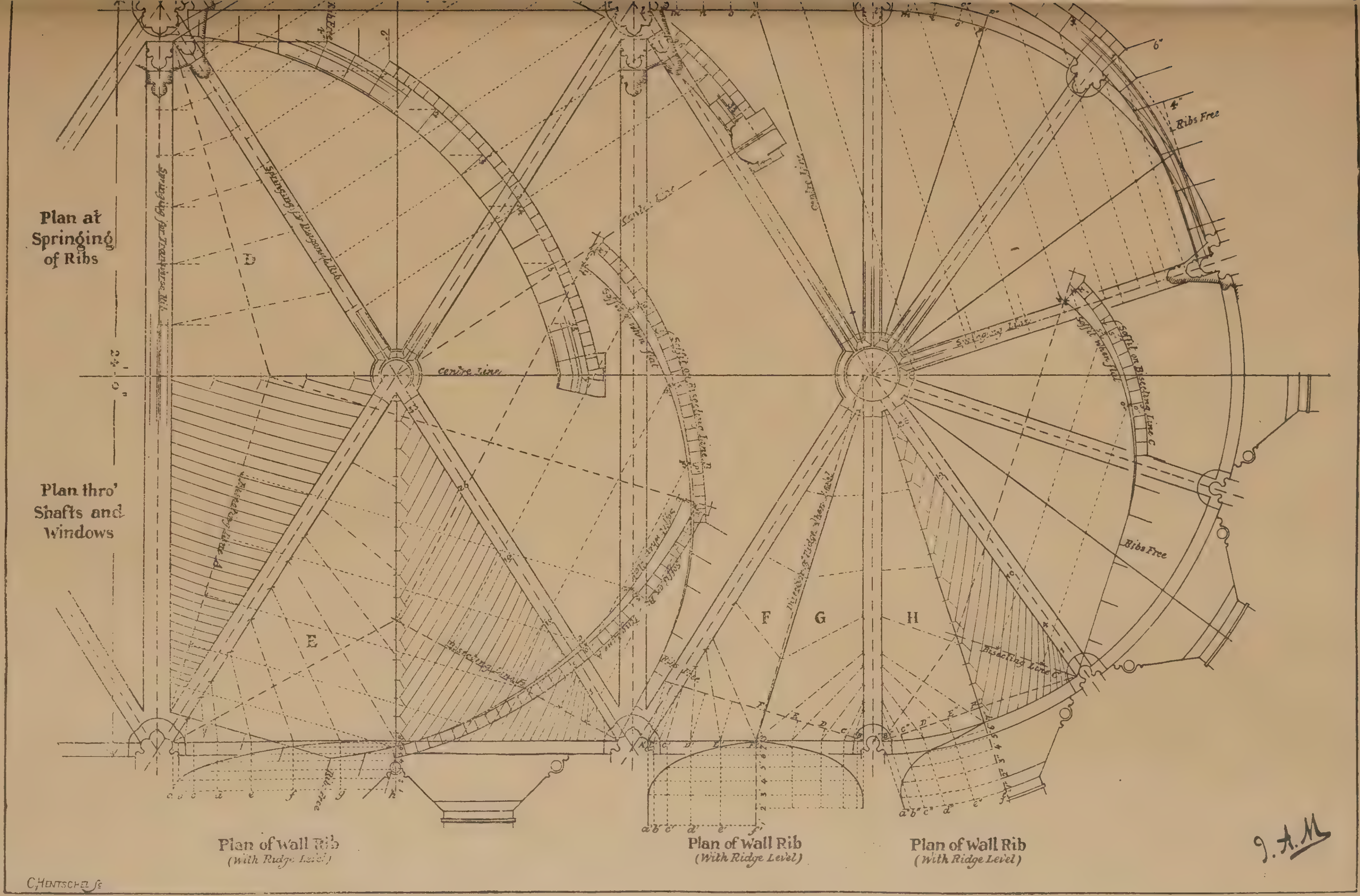
·Design·for·the·Stone·Groining·of·a·Semi-circular·Apse·



Note Ordinates —·—·—(for development of web next Diagonal Rib) are Horizontal Sections of Web, taken at different heights and are transferred from the Plan.


Plan at Springing of Ribs
Plan thro' Shafts and Windows
Springing for Transverse Rib
Springing for Diagonal Rib
Rib Free
Ribs Free
Centre Line
Soffit on Bisecting Line B
Soffit when flat
Soffit on Bisecting Line C
Springing Line
Bisecting Line A
Bisecting Line B
Bisecting Line C
Direction of Ridge when level
D
E
F
G
H
24'-0"
6"
4"
Plan of Wall Rib (With Ridge Level)
Plan of Wall Rib (With Ridge Level)
Plan of Wall Rib (With Ridge Level)
J. A. M.
C. Hentschel Sc

IN ILLUSTRATION OF "A SHORT LESSON ON GOTHIC VAULTING" (see page 506).

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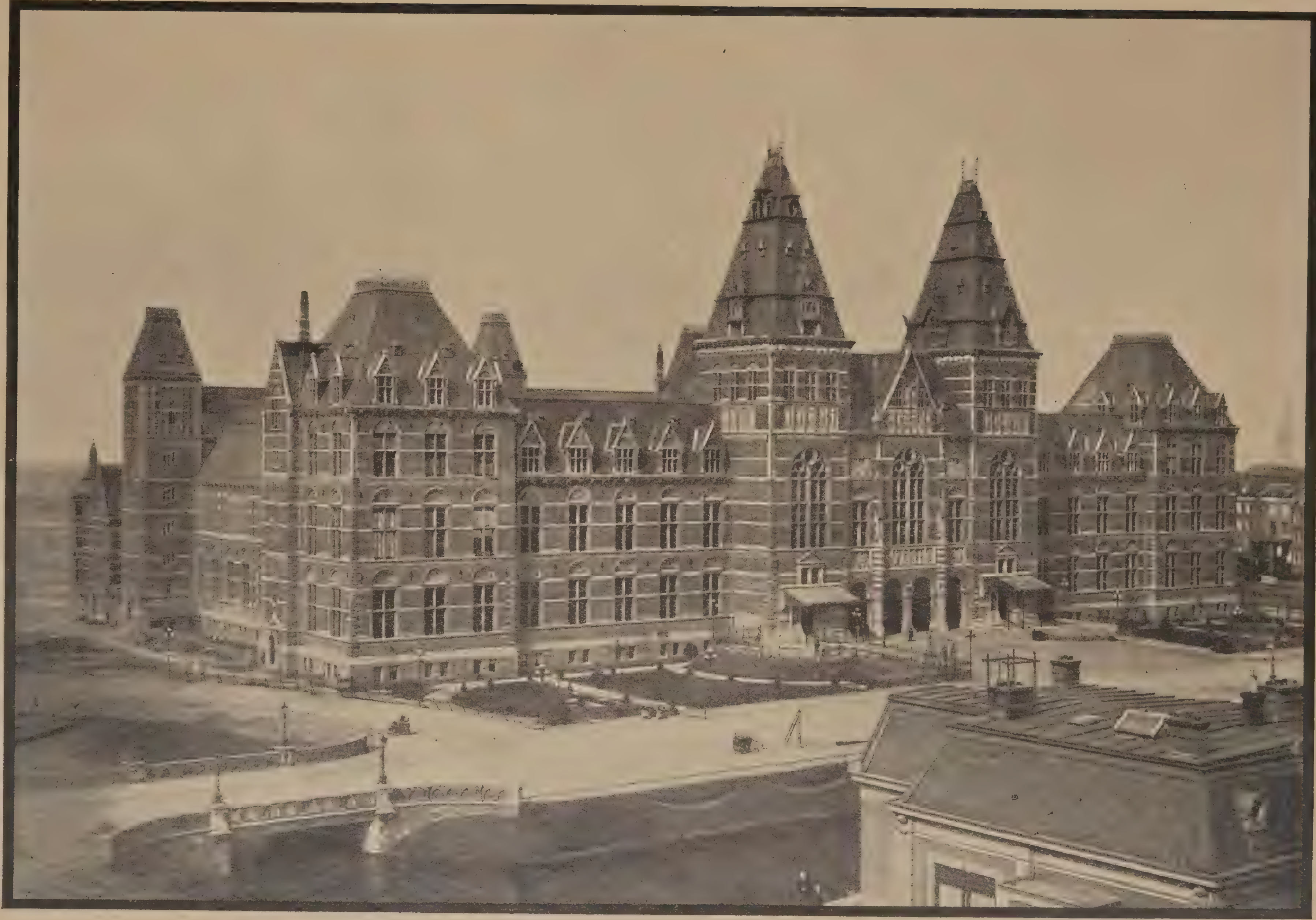

THE RYKS MUSEUM, AMSTERDAM. Dr. J. P. H. Cuypers, Architect.

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Engineering Notes.

The Mono-rail Scheme Sanctioned.—On Friday last a committee of the House of Commons sanctioned the construction of a high-speed railway on the mono-rail principle between Manchester and Liverpool.

The Extensions to the Keighley and Bingley Joint Hospital, Keighley, are being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues and patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

New East-End Railway Stations.—The Stepney Borough Council have received communications from the London County Council stating that that body has received communications from the Whitechapel and Bow Railway asking for the consent of the Council to the erection of new stations in the Mile End Road, one at the junction with Globe Road and the other at the junction of Burdett Road. It is probable that the Stepney Council will give their consent to the plans.

Nottingham's New Embankment was opened on Thursday last. It is about a mile and a quarter long and comprises 24 acres of land. The total width of land occupied by road, verges, slope, &c., varies from 170ft. to 250ft. The roadway is 36ft. wide, and is channelled with granite cubes, the remainder of the carriageway being laid with tar macadam. The whole of the works have been designed and carried out by Mr. Arthur Brown, M.Inst.C.E., the city engineer. Full particulars of the embankment were given in our issue for February 7th, 1900.

London County Council Tramways.—After several days' investigation of the Bill promoted by the London County Council for acquiring new tramways and working those and older lines by electricity, and for the widening of streets, the Select Committee of the House of Lords recently gave decisions. They declined to sanction the proposed line from Camberwell Green to Dulwich, that along Stamford Street across Blackfriars Road, and along Southwark Street, and also the extension of the line in Waterloo Road. They sanctioned the construction of lines from the existing tramway in the Battersea Park Road to Albert Bridge, and that from Lower Tooting along Garratt Lane to Wandsworth, and also an extension from Archway Tavern, Highgate.

The New Pier Pavilion at Dover was opened recently. It consists of a concert-hall, 85ft. by 50ft., with seating accommodation for about 950 persons, and dressing-rooms, refreshment-bars, shop, and pier-master's room are provided in the building. The hall is roofed in one span, with semi-circular steel trusses carried down to the pier girders, and there are no columns to obstruct the view of the platform, which is of ample size for an orchestral chorus. The cost of the scheme, which includes the revising and strengthening of the under-structure of the pier, has been about £6,600. The work was executed in seven months by Messrs. Anthony Fasey & Son, of Leytonstone, from plans by and under the superintendence of Mr. M. Noel Ridley, A.M.I.C.E., and Mr. Robert J. Beale, A.R.I.B.A., joint engineers, of Westminster, whose design was selected in competition.

A New Dock for London.—The Dover Harbour Bill and the Central London Railway (No. 2) Bill recently came before Mr. Hobhouse's Committee of the House of Commons as unopposed measures. Formal proof of the preambles was given, and the clauses adjusted, the Bills being subsequently reported to the House for third reading. The Central London Railway Bill provides for raising of additional capital and the purchase of further land at Shepherd's Bush. Lord Morley's Committee of the House of Lords on Unopposed Bills considered the London and India Docks (New Works) Bill under which sanction is given to the raising of £2,000,000 further capital, with the usual power to borrow a third as much more, with which to construct a large new dock at West Ham to meet the growth in the trade of the port of London. Formal proofs of the preamble having been given, and the clauses adjusted, the Bill, which has already passed the House of Commons, was ordered to be reported to the House for third reading.

A New Electric Railway in Italy forty miles long has just been opened between Milan and Varese. It is built on what is known as the "third rail" system, which is believed to represent a great economy as compared with the overhead wire system usually adopted for electric tramways. The carriages, which resemble Pullman cars, are furnished with four motors connected with the axles of the four sets of wheels, each motor drawing its motive power from a small rail running by the side of the line and communicating with the motor by means of a copper brush at level crossings; the third, or electric rail, along which the current passes, is interrupted, but the two ends are connected underground by means of a cable. At the stations the "third rail" is carefully protected from all possible contact with the travelling public. The distance of forty miles from Milan to Varese is to be regularly covered in fifty minutes, though a much higher speed is easily attainable.

Builders' Notes.

Finsbury Circus Garden was opened last week to the public. Formerly it was private property. The garden is 1¾ acres in extent. The cost of the works is between £400 and £500.

Mr. Fred Noble, builder, of Ongar, died recently. Deceased had carried on an extensive business as a builder for upwards of fifty years, and was in his eighty-fourth year.

A New Hospital for Epilepsy and Paralysis is in course of erection in Maida Vale from the design of Messrs. Young & Hall. The building is to be fireproofed throughout on the Fawcett system. The builders are Messrs. Prestige & Co.

The Smoke Nuisance.—Last week the Westminster Electric Supply Co. were fined £10 for not complying with a notice requiring them to abate a nuisance caused by black smoke from their chimney shaft. Messrs. Mowlem & Burt were similarly fined.

A Fire Prevention Committee for the Continent.—Count Kamarowsky, president of the International Council, which held its congress at Berlin last month, and who is now on a visit in London, was entertained recently by the chairman of the British Fire Prevention Committee at the Carlton Hotel to meet the various chairmen of sub-committees and also the four vice-presidents of the National Fire Brigades Union. The International Council proposes forming a technical research committee on the Continent, with objects not unlike those of the British Fire Prevention Committee, and it was with the view of deciding on the preliminary arrangements that Count Kamarowsky made a careful inspection of the Committee's Testing Station, and several public buildings in which fire-preventive measures have been applied. Facilities were also afforded him to view the stations of the Metropolitan Fire Brigade and the London Salvage Corps.

Scientific but not Architectural.—An agent on behalf of the governors of George Watson's College for Boys in Archibald Place, Edinburgh, recently applied to the Edinburgh Dean of Guild Court for warrant to erect an additional classroom at the college. The Scottish Education Department, he said, desired that there should be further accommodation for the teaching of science, the present classroom not possessing sufficient cubic space. Dean of Guild Ormiston remarked that the suggested alteration was an extraordinary one. The court did not think the governors were improving that beautiful building by putting this roof on it. It was a handsome public building, and he thought the governors should really reconsider the case before rushing to spoil a building which they never could put right again. The agent stated that the department were pressing the Governors to make further accommodation for the teaching of science. The alterations were required by October 1st, and the governors wanted the matter set on foot as soon as possible. They were quite willing to come back to the court at a later stage. The dean observed that the alterations might be for the teaching of science, but certainly not for the teaching of architecture or taste. It might be possible to flatten the roof so as to give it a more classic appearance. Mr. Rose, architect, said the governors were determined there should be no deterioration in the appearance of the building. Warrant was granted.

The Contract for Building the New Church at Oystermouth, near Swansea, has been placed in the hands of Mr. A. J. Howell, contractor, of Galston Place, Cardiff, who will erect it from plans prepared by E. M. Bruce Vaughan, Esq., F.R.I.B.A., of Cardiff.

New Granite Works at Trafford Park, Manchester.—The industries represented in Trafford Park, Manchester, are about to receive a notable addition by the opening of the new granite works of Messrs. Kirkpatrick Brothers. The firm has been established at the Manchester Granite Works, Hyde Road, since 1884, and the steady increase of its business has necessitated the removal. Two acres of ground have been secured close to the Ship Canal Wharf, and a spacious building is rapidly approaching completion which will contain under one roof a full complement of the most modern machinery—including pneumatic hammers—for sawing, turning, carving and polishing granite for architectural, monumental and engineering purposes. A large stock of Aberdeen, Swedish, American, Irish and other granites will be kept, and architects and contractors will be able to see the work fixed in the dry; any additions to or alterations of their plans can then be made at once under their immediate supervision. Further advantages will be that orders will be quickly executed and a considerable saving of carriage effected. The works will be lighted and the machinery driven by electricity. It is probable that Messrs. Kirkpatrick Brothers may also represent several firms in allied trades who wish to take advantage of the opening given by the Ship Canal into the thickly-populated district of which Manchester is the centre.

London County Council.—At last week's meeting the Improvements Committee recommended that the working drawings, specification and estimate of the cost, £29,400, of the paving and other works connected with the widening of Piccadilly between Hyde Park Corner and Walsingham House, by the addition to the public way of the strip of the Green Park, should be referred to the manager of the Works Department with a view to the work being carried out without the intervention of a contractor. Mr. W. H. Dickinson moved that the plans should be amended to provide for the retention of the greater number of the trees at present proposed to be cut down. He suggested that the trees might be left standing in the road. Mr. W. Peel considered the whole of the improvement was unnecessary. Mr. Emden said that the trees would die if left in the middle of a paved roadway. On a division the amendment was negatived. Mr. Sidney Low then moved that words should be added to the recommendation that a report should be made on the suggestion for constructing a subway under Piccadilly at Hyde Park Corner. This was defeated. It was agreed that the Improvements Committee should again confer with the Office of Works with a view to saving more of the trees than now contemplated.—Replying to Mr. Burns, Lord Monkswell said he had received a letter on behalf of the owners offering to sell the Richmond Hill property to the council for £70,000. The conditions attached to the offer were that a deposit of £3,500 should be paid down on the signing of a formal contract, which should be forfeited if the council did not complete the purchase by December 31st next. The owners, on their part, agreed to stop all development work until that date.—The General Purposes Committee recommended that an advertisement be issued inviting applications for the appointment of chief engineer of the council at a salary of £2,000 a year in the place of Sir A. Binnie. The recommendation was adopted —The Improvements Committee recommended that an estimate of £50,000 submitted by the Finance Committee be approved, and that contribution of that amount be made towards the cost of widening the Strand to 80ft. at Nos. 89, 90 and 94 to 104, proposed to be undertaken by the council of the city of Westminster.

The recommendation was adopted.—A report was submitted by the Highways Committee to the effect that the electrical engineer and the tramways manager be authorised to visit America at the expense of the council to inquire into the system of shallow underground tramways and also as to the latest system of tramway traction in America. The matter arose in connection with the suggestion to make a shallow underground tramway from Westminster to Finsbury Pavement via the Strand, Fleet Street and Cheapside. Mr. Benn said that the officers could pay attention to the developments in motor cars in America if they had the opportunity.—Plans were approved for new technical institutions at Poplar and Brixton. The sites for both institutions have been secured. The Brixton institution is intended for the instruction of persons engaged in the building trade.

New Building By-laws at Middlesbrough.—It was reported to the plans committee of the Middlesbrough Corporation recently that a deputation had seen Mr. Grant Lawson, M.P., the Parliamentary secretary of the Local Government Board, with reference to the objections to the new building by-laws for Middlesbrough. Mr. Grant Lawson said that the only point that need be discussed was the question of paving back passages. The by-law required that all back passages not exceeding 12ft. should have 6in. of concrete foundation. Mr. Grant Lawson argued that there was no necessity for it in towns like Middlesbrough, and he gave them to understand that there was no chance if they stood out for a concrete foundation in narrow back streets of the new by-laws being sanctioned by the Local Government Board, and as they wanted them approved and in operation as soon as possible they gave way, and a few days after the new by-laws obtained the consent of the Local Government Board. The changes in the by-laws had since been communicated to all the builders and architects in the town. There has been no alteration of the old by-law save the omission of the 6in. of concrete foundation. All plans sent in before the new by-laws received the approval of the Local Government Board were passed.

Masters and Men.

Bradford Building Trade Dispute becomes Worse.—The dispute in the Bradford building trade still continues, and the spirit is growing more bitter.

The Bricklayers' Strike at the Hartlepools, which has lasted twelve weeks, was settled last week at a meeting of the Teeside Master-Builders' Association and the men. The men asked for a penny per hour advance, and have accepted a halfpenny upon concessions in regard to rules being made on both sides.

A Strike of Masons at Llandudno has occurred. The cause of the dispute involves the difference between "waller" and "banker" masons. The latter deny to the others the right to dress freestone after they have laid the stones in position, and the wallers claim that local custom entitles them to do so. Between 300 and 400 men are on strike, and the masonry work on the new baths and hotel on the pier is in complete abeyance. The contractors, Messrs. Waring & Gillow, had intended to open a part of the hotel on August 20th, but this strike unhinges all arrangements. About 150 men on the Forester's Convalescent Home, which is in course of erection, have also ceased work for the same reason. Negotiations between the men and the master-builders are proceeding.

The Penrhyn Quarry Strike.—It will be remembered that the Penrhyn Quarry was reopened on Monday, June 11th, with nearly 600 men, or rather less than a quarter of the usual number. The output during the first quarry month (four weeks) was over 2,000 tons of slates; and every week some fresh men and boys resume work, about eighty having gone in during the past six weeks. The workmen now employed held their first meeting recently, and unanimously passed the following resolution: "We, the workmen in the Penrhyn Quarry, wish to tender our hearty thanks to Lord Penrhyn for the generous bonus of 5 per cent. given to us this month in addition to the 5 per cent. rise given to us voluntarily by Lord Penrhyn in January, 1896. We also avail ourselves of this opportunity to acknowledge gratefully the constant kindness of his lordship towards us as workmen and neighbours at all times, but especially in time of sickness and distress. Yet more do we wish to place on record our warmest thanks for the relief the funds of our benefit club have had by his lordship's generously taking upon himself the expenses of the hospital and the doctor's salary. Also for the help given in a quiet and unobtrusive way to the sick during their convalescence by sending them to and bearing their expenses in convalescent homes, and for other gifts we know of well enough."

The Yorkshire Slating Trade.—Representatives of the masters and men engaged in the Yorkshire slating industry met recently at the Leeds Builders' Exchange for the purpose of agreeing upon a new set of working rules and, *inter alia*, of deciding upon the standard rate of wages which shall be observed in the trade. The conference was held under the presidency of Mr. Samuel Worsnop, of Leeds, president of the West Riding branch of the National Association of Slate Merchants. The possibility of a strike has been averted. Up to now each town in Yorkshire has had its own working rules, but as the result of yesterday's conference one code will in future operate in the entire county. The advantage of such an arrangement is, of course, obvious. But in suggesting it the operatives, who are affiliated with the Amalgamated Slaters and Tilers' Provident Society, had admittedly an interested motive. First they sought a standard rate of wages—there has been nothing of the kind in Yorkshire before—and asked that it should be 9½d. per hour. The employers could not see their way to go as far as this, but in the end compromised matters by agreeing to pay wages (in town and out) at a rate of 9d. an hour. In some places a halfpenny more has been paid, but there are other towns in which only 8½d. and even 8d. has been paid, so that what is regarded as a happy mean has been struck. This part of the business over, the meeting devoted consideration to the remainder of the working rules, which were discussed on the give and-take principle. At the beginning there was an agreement that when once adopted these should be paramount to the rules of any federation to which the operatives might be affiliated, and that the grievances of other trades should in no way prejudicially affect the spirit of the rules adopted. In this connection the following rule was agreed to: "That no workman or branch of the Operatives' Society shall be allowed to strike or turn out without first obtaining the consent of the executive council of the Amalgamated Slaters and Tilers' Provident Society." This, it is felt, will remove many of the grievances of which employers have complained in the past. Beyond this, the men's representatives have given an undertaking that non-unionists at present employed shall not be interfered with. A satisfactory feature is the provision made for settling all disputes by arbitration. A committee representing both sides is first to go into all questions in dispute, and work is to proceed without stoppage until a decision is come to. Then, should the efforts of the committee fail, the matter is to be referred to the arbitrament of six members of the National Association of Slate Merchants and Slaters and six members appointed by the Operatives' Executive, who meet (in the town affected by the dispute) within fourteen days of the reference to hear the evidence for and against and give a final and binding decision on the grievance. Other rules of minor importance were adopted. One stipulates that the wages of aged or infirm workmen are to be a matter of individual agreement, and another entitles each master to one apprentice. Time-and-half is to be paid for Saturday afternoon work and double time for Sundays and Christmas Days when the workmen are requested by the employers to work. None of the rules adopted can be altered under six months' notice, which must be given during the month of January.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

ANNUAL CONGRESS.

THE fifty-eighth annual congress of the British Archæological Association was held at Newcastle-on-Tyne from July 18th to 24th. On the first day the members were received in the council chamber of the town hall by the mayor and corporation, after which the cathedral, the castle with its Black Gate, the city walls, St. John's Church, the Trinity House and other buildings were visited. On Friday Alnwick was visited, the party driving to Hulne Priory, which was described by Mr. George Patrick, A.R.I.B.A. The fine church at Jarrow was first inspected on Saturday, Monkwearmouth Church and Tynemouth Priory being visited later.

On Monday an excursion was paid to Chesters and various stations on the Roman Wall. Various places of interest were pointed out en route, including the birthplace of Bishop Ridley, Vindolana, the ninth station from the eastern end of the Wall, the Roman station at Housesteads known as Borcovicus, and the camp of Procolitia. Cilurnum, the sixth camp from the east end of the Wall, was also visited. Much time was spent in examining the ruins of a Roman villa, which is thought to have been the residence of the governor at Cilurnum. This is the highest piece of masonry on the line of the Wall, there being in places as many as twenty-three courses of stone standing. At the close of the day's excursion very cordial votes of thanks were passed to Mr. J. P. Gibson and Mr. R. H. Forster for acting as guides.

Holy Island was visited on Tuesday, the drive across the three-mile stretch of sands to the island being much enjoyed by the visitors, who were charmed with the majestic castle at Bamburgh, clearly visible to the south, whilst westward Hedgehope and Cheviot could be seen. The ruins of the Benedictine priory were first inspected, and here an interesting paper was read on the early history of Lindisfarne by the Rev. H. J. Dukinfield Astley, the hon. editorial secretary, who also described the Priory and castle. The vicar of Holy Island (the Rev. D Bryson) kindly showed the visitors over the church, where some Saxon stones were pointed out.

The members paid a visit to Durham on Wednesday. Arriving in the city about 10 o'clock the party was received in the vicinity of the cathedral by the Dean of Durham (Dr. Kitchin), who conducted them over the cathedral and its precincts. The dean read an able paper on the "History of the Cathedral Statutes." In the afternoon a visit was paid to the Castle.

In the evening the concluding meeting was held, when the Rev. H. J. D. Astley read a paper, written by the Rev. C. H. Evelyn-White, on "The Galilee as a place of sanctuary, with a suggestion as to the term 'Galilee.'" Votes of thanks were passed to all who had been instrumental in making the meetings so successful.

Mr. Norman Leech, aged twenty-four, who is at present working as an architect in private practice in London, and is a member of the Society of Architects and a student of the Royal Institution of British Architects, has been appointed a teacher of architecture at the new Norwich Technical Institute. During 1893–6 he was an assistant in an architect's office in South Africa (Mr. Leech was born in South Africa). During the early part of 1897 he visited Italy, Germany and Switzerland for the purpose of study. During 1897 and 1900 he was a student in the architectural division of King's College, London, and during 1897–9 he was also a student in the civil engineering division. At King's College he gained a gold medal in architecture (first place), two silver medals in building construction (both first places), bronze medal in history of architecture (second place), and bronze medal in elementary studio (third class).

Law Cases.

Sequel to a Builder's Bankruptcy.—In the lourt of Appeal on July 22nd the case of *Davis , Gibbs and another* came on for further rgument. The plaintiff, who was the trustee in ankruptcy of a builder named Ham, claimed ,744 balance certified as due by the architect nder a building contract for work and labour done t the "Gibraltar" public-house, St. George's .oad, Southwark. The defence, which was in ie nature of a counter-claim, was that under the greement if the work was not completed by given day a penalty of £10 a week was to be aid by the builder until the work was finished. 'he work was to have been finished in twenty-wo weeks from its commencement in September, 899 (*i.e.*, in February, 1900), whereas the final ertificate of the architect was not given until larch, 1901, so that the delay was more than a 'ear. The Master of the Rolls said the appeal aust be allowed. The defendants' case was that he plaintiff had delayed completing the work so ong that they (the defendants) were entitled to laim damages for the delay, and therefore ntitled to defend under Order XIV. In his pinion, having regard to the fact that the remises were licensed premises and business vas being carried on all the time this rebuilding vas in process, that was a substantial and not a iebulous defence. He thought the defendant hould have leave to defend without being ettered by any condition such as payment into ourt. The order appealed against would there-ore be set aside, and the issue go to trial in the rdinary way. The lords justices concurred.

Respecting Slates.—At the Plymouth County Court recently Messrs. Jefferd & Sons, merchants, laimed £33 11s. 3d. from R. H. Pearce, uilder, St. Ives. Mr. E. R. Ward for plaintiffs xplained that in April last defendant gave an rder to his clients' traveller for 325 dozen of Anger slates for the roof of a chapel which lefendant was erecting at Carbis Bay. On May 25th plaintiffs wrote to defendant that they proposed to send the slates on the following Tuesday unless they heard from him to the ontrary. Receiving no reply, on May 28th plaintiffs sent on the goods. Defendant wrote omplaining that the goods had been sent on without his instructions, and refused to accept them as the architect declined to pass them. Eventually the slates were returned to plaintiffs. The claim was for the value of the slates, £27 17s. 10d.; railway charges, £5 6s. 2d.; and unloading expenses, 7s. 3d. Mr. Percy Pearce submitted that no order was given for the slates. All that was given in April was the promise of an order. Defendant fully intended that plaintiffs should have an order provided the slates were such as would pass the architect. Even if there was a contract, it was on plaintiffs' own showing a conditional one. The slates were only to be sent when defendant was ready for them. Defendant denied giving any order for the slates. At the interview in April he stipulated that a sample of the slates should be sent to him for the architect's inspection. In May he was not ready for the slates. His Honour came to the conclusion that no order had been given and gave judgment for defendant.

The Trade Union Case.—Last week in the House of Lords the case of the *Taff Vale Railway Co.* v. *the Amalgamated Society of Railway Servants* came on for hearing. It was an appeal from an order of the Court of Appeal, and it raised an important question with regard to trade unions and strikes. The respondents are registered under the Trade Union Act, 1871. The society has about 536 branches and 65,000 members, and their funds amount to about a quarter of a million. The case for the appellants, the Taff Vale Railway Co., was that in August, 1900, certain of their servants who were agitating for alterations in their conditions of service and for the reinstatement of a signalman who had been discharged were assisted and encouraged by James Holmes, who was not in their employ. A number of the servants having given a fortnight's notice to terminate their employment, two meetings were held on Sunday, August 19th —one of the executive committee in London, and a mass meeting of the appellants' servants at Pontypridd. The executive committee decided that the action of the men previously to consulting the committee was most condemnatory, and the meeting practically decided on a strike. At midnight on August 19th many of the men ceased work, and the stations and other premises of the railway were watched and beset by pickets of men on strike, organised and paid for by the respondents, and the whole traffic was in effect paralysed. On August 20th Mr. Bell, the general secretary, writing on behalf of the Amalgamated Society to the directors, complained of the treatment of the signalman, and suggested to the company that all negotiations should be through him. The company engaged fresh servants to carry on the work of the railway, but the same organisation for interference was continued by the officials of the respondent society, and the company set out in detail the various alleged illegal acts of which they complained, one being a leaflet circular by Bell, winding up with the question, "Are you willing to be known as a blackleg?" On August 23rd the railway company commenced an action against the defendant society to restrain them from committing these acts, and on the 30th an application for an injunction against Bell and Holmes was made to Mr. Justice Farwell; on the same day the respondents also made an application to him to strike out of the action the name of their society. Mr. Justice Farwell granted an injunction against Bell and Holmes, and reserved judgment as to the respondents' application. On September 5th Mr. Justice Farwell found as a fact that the respondents were responsible for the acts complained of, and granted an injunction against them and dismissed the application of the respondents to be struck out of the action. The respondents appealed against these orders to the Court of Appeal, who allowed the appeal, and the respondent society was struck out of the action and the injunction against it dissolved. The point was whether the action was maintainable against a trade union society like that of the respondents. The Court of Appeal held that it was not maintainable. The appellants now contended that a trade union registered under the Trade Union Acts, 1871 to 1876, was liable to be sued in its registered name in respect of wrongs committed by its executive officers under its direction and at its expense. The Lord Chancellor moved that the appeal should be allowed, that the judgment of the Court of Appeal be reversed and that of Mr. Justice Farwell restored. Lord Macnaghten in the course of his judgment said he was of the same opinion. The other lords concurred, and the appeal was therefore allowed with costs.

Ancient Lights: Interesting Case at York.—At the Yorkshire Assizes on July 24th Mr. Justice Bruce resumed the hearing of an action brought by McLaughlin and others, the trustees of the Irish National League Working Men's Club, against George Moss, builder, of York, and a member of the city council, for compensation for alleged damages. The plaintiffs claimed that their property had been injured by the action of the defendant in pulling down his adjoining building without making due support, thus causing shrinkage of the walls. They also claimed damages in respect of interference with ancient light and air, which they alleged was due to the erection of a new and larger building. Mr. Thomas Winn, architect, of Leeds, stated that he had recently made an examination of the property, and in his opinion the additional weight of the new buildings put up by the defendant had caused a settlement in the ground and a shrinkage on the right-hand passage-wall of the plaintiffs' property. He should estimate that the rental of the property had depreciated to the amount of about £5 per annum, which at twenty years' purchase represented £100. Mr. J. Bromet, architect and surveyor, of Tadcaster and Leeds, gave similar testimony. For the defence it was suggested that there was no damage at all caused either by pulling down or rebuilding. They admitted a certain amount of injury to the lights, but did not consider that such injury was substantial enough to be actionable; but if the judge held the contrary it was submitted that the £20 paid into court was sufficient. The learned counsel further contended that if no damage was caused by the rebuilding the plaintiffs had no cause of action, because the pulling down was completed on March 20th and the plaintiffs had absolutely no interest in the property until March 22nd. A bulging wall referred to was in exactly the same position when the property was bought as it was now. The bulge in his opinion was of very old standing. Messrs. Edward Taylor and Gascoigne Hastings Fowler Jones, architects, also gave it as their opinion that the bulging wall was old. His Lordship in giving judgment said there could be no doubt that the lights were ancient and that there had been obstruction, and obstruction of such a character as to entitle the plaintiffs to maintain their action, but it was difficult to assess the value which the plaintiffs were entitled to recover. One of the windows measured 5ft. by 4ft. 6in., and was obstructed to the extent of 24 degs. At the same time it never had a very good light. It faced east, and would only obtain light in the eastern direction over the wall and roof of the house adjoining. Although the obstruction was appreciable, he did not think it was very important. The other window was 2ft. 6in. by 3ft., and had a northern exposure which had not been interfered with, but there had been an interference to the east, laterally. He thought the plaintiffs were entitled to recover, and fixed the amount at £50, being £30 in excess of the £20 already paid into court by the defendant. In the other part of the case it was for the plaintiffs to prove the damage occasioned by the defendant's act, and he had come to the conclusion that they had failed to do so. On this part of the case, therefore, he gave judgment for the defendant.

PROTECTING THE NATIONAL GALLERY.

THE DISCUSSION IN PARLIAMENT.

IN the House of Commons last week, on the resolution authorising the payment out of the Consolidated Fund of any expenses which might be incurred by the Office of Works for the acquisition of land near the National Gallery, Mr. Healy objected on the ground that nothing was done for the advancement of art in the sister isle. The idea, he said, seemed to be that London was to swallow up everything. At least some equivalent grant ought to be given to Ireland. Mr. Akers-Douglas explained that it was proposed to acquire three or four buildings in Pall Mall in order to secure complete isolation on the western side for the National Gallery to protect it from fire. Lord Balcarres pointed out that the National Gallery of Ireland was already isolated. Mr. Healy: "There is nothing worth burning in it." Lord Balcarres said that on the contrary the National Gallery of Ireland, which was formed by a great expert, the late Mr. Doyle, was one of the most interesting collections of pictures in Europe. The Government had voted £10,000 last year for the extension of the National Gallery of Ireland, £9,000 for the same purpose was on the estimates this year, and a further £3,000 was promised next year. He should have thought these facts were known to the hon. member for North Louth. Mr. Burns appealed to Irish members not to delay the passing of the Bill, the object of which was simply to isolate the National Gallery, which he ventured to say contained the finest collection of pictures in the world. He dwelt on the danger of keeping the National Gallery exposed even for another twenty-four hours to the danger of fire. Mr. Healy contrasted the expenditure lavished on art in England, amounting to £200,000, with the sum of £2,400 in Ireland and upwards of £3,000 in Scotland, and urged that equal measures of precaution and expenditure should be taken in respect of the National Gallery in Ireland. Personally he had no art side. Potatoes and salt were the highest ideal of Irishmen, and they managed to get on fairly well without Murillo. (Laughter.) Mr. O'Mara said that he had visited many of the art galleries in Europe, and he had come to the conclusion that the works of art displayed on the walls of the National Gallery were a lot of rubbish. (Derisive laughter.) After further discussion the resolution was carried by 170 votes to 6.

A Stained-Glass Window in Faversham Parish Church has been erected in memory of the officers and men of East Kent who have fallen in South Africa during the present war.

A SHORT LESSON ON GOTHIC VAULTING.

By JOHN A. MARSHALL.

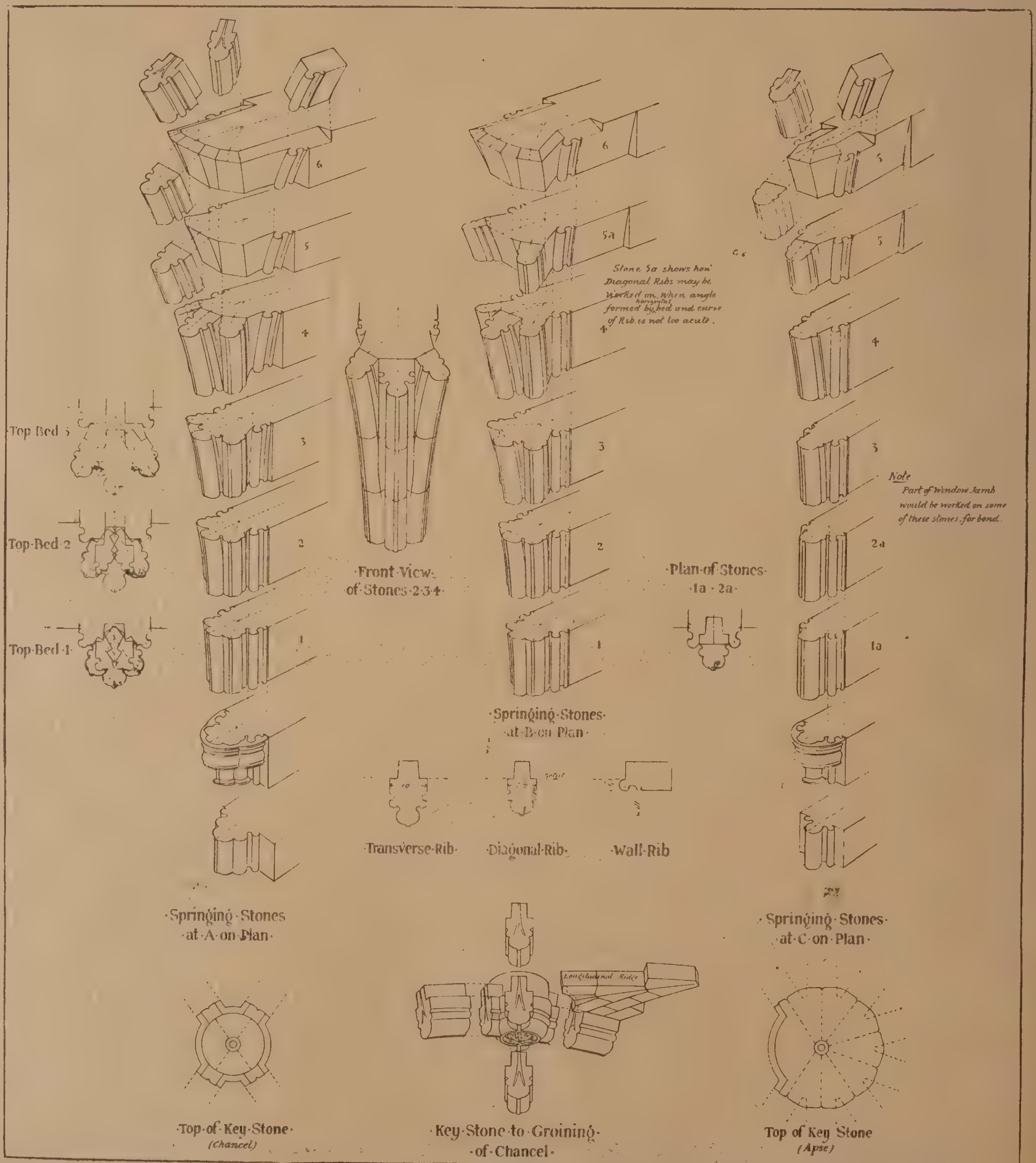
THE study of Gothic vaulting is now, we believe, mainly confined to the speculations of the archæologist; the impetus given by the enthusiastic exponents of the "Gothic revival" has all but died away, and respecting this phase of architecture we are in a position that reminds us of the poet Browning, who, when asked to explain one of his early poems, replied that doubtless it had a meaning once, but he had quite forgotten it. Yet the student of to day cannot afford to ignore the subject of Gothic vaulting altogether, and in view of this we have rescued from oblivion the set of Grissell medal drawings on which the following remarks are based.

From the standpoint of design these drawings, it must be admitted, possess but little merit, and they should be regarded merely as diagrams to illustrate the setting out and the construction of an ordinary Gothic vault. It should also be explained that on the original drawings the ordinates by which some of the curves are developed are distinguished by different colours, but as these colours cannot be reproduced we can only hope that the confusion of lines will not prove too serious.

The space to be vaulted is a chancel 24ft. wide, terminating in a semicircular apse. For the bays in front of the apse the simple "quadripartite" system is adopted, the space being spanned by light stone arched ribs, some taking a transverse direction, others a diagonal, so that they may serve as a permanent centering for the thin filling-in of the vault; the weight and thrust are thus concentrated on a few points. As a commencement for the radiating system of the apse the first narrow bay is arranged on what is known as the "sexpartite" system, or rather a modification of that system—common in France and adopted at Canterbury—wherein the ordinary diagonal ribs are intersected by a transverse rib, which divides the bay into two parts, each with a ridge inclined on plan from the point of intersection to the crown of the windows. One-half only of this arrangement is adopted in our illustration, because the transverse rib just mentioned is placed on the chord of the apse as a starting-point for the radiating ribs.

Having settled the general disposition of the vaulting ribs, their section, and the plan at the springing on the abacus of the cap, it remains to determine their curve. We have commenced by making the diagonal ribs a semicircle, struck from a centre on the level of the caps; this gives two points that regulate the curve for the transverse ribs, viz., the height of the filling-in at the apex and the point where these ribs separate, a little above the springing; this point on the curve is found by transferring it from the plan to the soffit line on the elevation. In striking the curve for the transverse rib it may be a compound curve or struck from one centre only, so long as it passes through the two points mentioned above. Although in this design the curve of the diagonal ribs was settled first, and that of the transverse ribs made dependent on it, yet this order of setting out the work may be reversed if desirable.

The wall rib can seldom be arranged to part from the others at the same level unless the compartment to be vaulted is square, or nearly so, and having no weight to sustain, this rib is generally made subordinate to the others, while

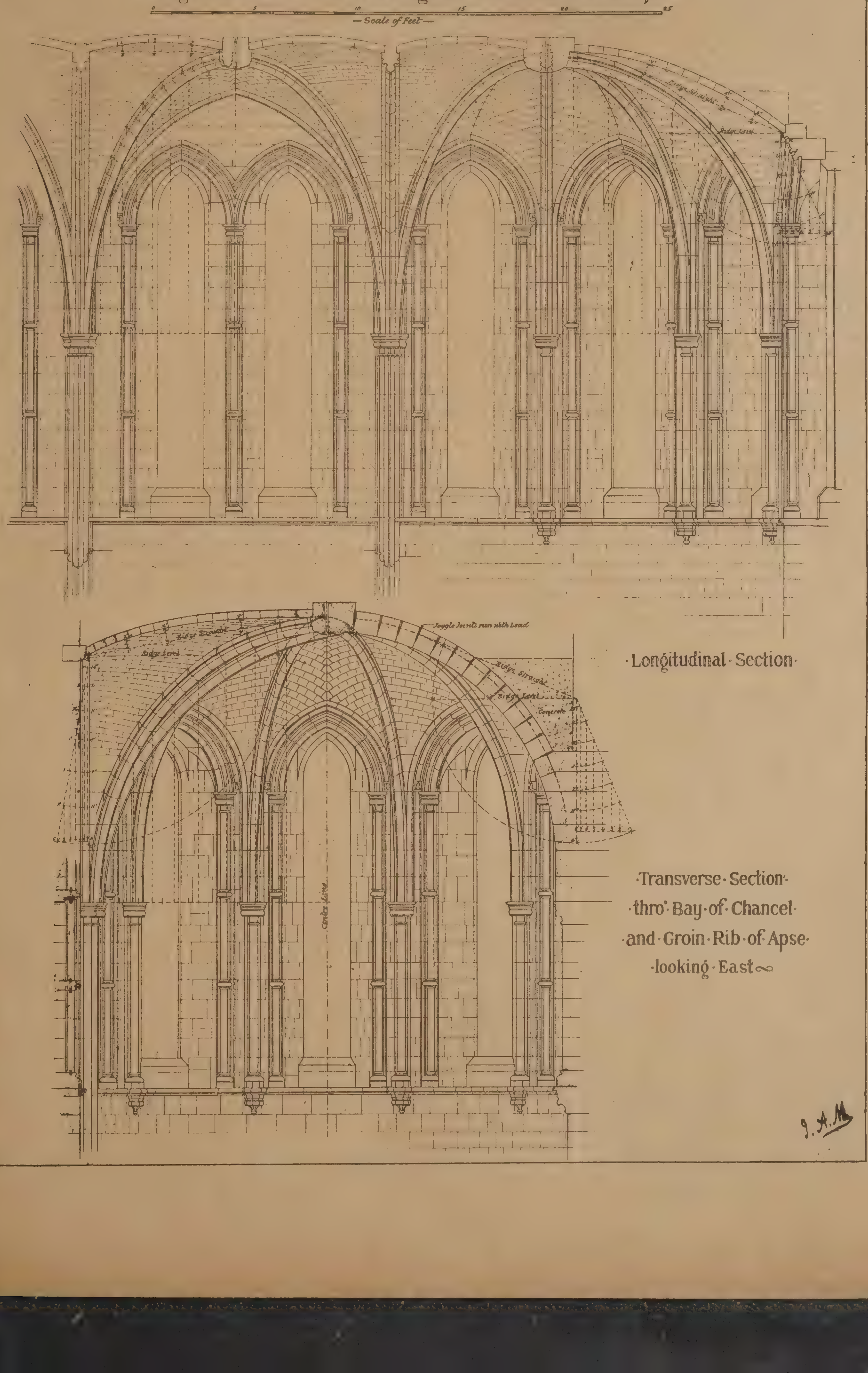


DESIGN FOR THE STONE GROINING OF A SEMICIRCULAR APSE. BY JOHN A. MARSHALL.

the main transverse ribs should be made larger than the rest. The common expedient of stilting the walls ribs to make room for the windows is another factor affecting the point of separation. Up to this point it is usual to build the work in horizontal courses, each course in a single stone, with the beds cutting the mouldings obliquely, instead of being normal to the curve. This method of corbelling practically reduces the span and simplifies the working of the stones, for it will be evident that if the top bed of all the springers is bevelled in front for the mouldings, the underside will have to be hollowed out to fit, thus involving a waste of material and labour. At the level where the ribs become free, or independent of each other, the top bed is of course bevelled to take the voussoirs, which are turned on centering in the usual way.

Keystones, or bosses, are introduced to receive the ribs at the apex; this avoids irregular intersection of the mouldings, and the stability of the vaulting is increased by the pressure of the key at the crown. The top of the boss should

·Design·for·the·Stone·Groining·of·a·Semi-circular·Apse·



project above the filling, and be worked with a level surface on which the radiating centre lines can be inscribed to serve as a guide when the ribs are being turned.

To take the filling it is usual to form rebates on the sides of the ribs. These rebates need not be cut back more than three-quarters of an inch, as it is important not to weaken the ribs, but a slight skewback should be formed in addition to the rebate when the filling is arched or domical, as in the present instance. There is no fixed rule for the direction on plan of the narrow courses of the filling-in, but by placing them at right angles to a line bisecting the angle formed by the ribs the pressure on the ribs is equalised, and, perhaps, the most satisfactory appearance is obtained. It also facilitates the application of a movable hand centre that can be adjusted to suit the varying spans of each course. The domical method of turning the spandrels rendered the use of continuous centering unnecessary, though in England the usual practice was to form the spandrels flat from rib to rib. When the soffit is domical the ridge requires a special centre, because its curve is developed by the intersection of the spandrels at the apex. The ridge stones on which this curve is worked are sometimes made long enough to include two or three courses of the filling, and the notching of the ridge stones for this purpose may then be worked *in situ* to ensure accurate adjustment.

From the level where the ribs separate the pockets are generally filled in up to about one-third of the height with stone chippings or a light kind of concrete. Sometimes the whole of the vaulting was covered with a layer of mortar and rubble, probably poured on hot so that the filling and the ribs become one entire substance—practically concrete. In this connection the following extract from the report accompanying the drawings submitted by Mr. Burges for a church at Constantinople may not be uninteresting: "For the sake of lightness, and in order to diminish the thrust, it is proposed to make the filling-in of the vaulting of a light concrete like that used at Salisbury Cathedral. It is much lighter than any stone, and should a settlement occur does not become detached in small pieces as a brick vault would, but simply cracks. For a similar reason it is carried over the ribs and not rebated on to them. In France, where this system is followed, the author has seen several vaults (the cloisters of Rouen, for instance) where the ribs have fallen, but the filling-in remains quite perfect."

Lastly, cement should never be used in the jointing of Gothic vaulting. It will prevent elasticity and stain the stonework. The rib stones should be dowelled together, either as shown or with slate dowels. For the ribs, only very light framed centering is required, but to keep the voussoirs in position until the completion of the vaulting small pieces of bracketing must be nailed on each side of the centres.

A Busby Competition.—In the recent competition for plans of the proposed new school at Busby, in place of that destroyed by fire, Messrs. W. G. Rowan, I.A., John Watson & Salmond, and H. D. Walton, architects, Glasgow, have been awarded premiums of £25, £20 and £15 respectively by the assessor, Mr. H. E. Clifford, architect, Glasgow.

Camberwell's New Public Building.—A new Passmore Edwards Public Library and St. George's Public Baths and Washhouses is being erected. The land forming the site had been given to the borough by Lord Llangattock. The foundation stone of the baths and washhouses was laid last week by Lady Llangattock, while Mr. Edwards discharged a similar function in respect of the library. The buildings will be of Portland stone and red brick walling, with granite to the baths entrances and roofs of Broseley tiles. Seen in conjunction with St. George's Church close by, next to the canal, the new institutions will form a conspicuous addition to the public buildings of Camberwell. The baths will furnish fifty slipper baths, and the laundry will provide for thirty washers at the same time. Besides the lending library there will be a reference reading-room and a newspaper-room. The building, exclusive of engineering work and the value of the site, will cost £18,000. The architects are Mr. Maurice B. Adams and Mr. W. Oxtoby, the borough engineer.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Unsatisfactory Pupilage.

BIRMINGHAM.—S. C. writes: "About fifteen months ago I articled my son (seventeen) to a firm of architects and surveyors, who covenanted to teach him for a term of three years. At that time there was also another pupil in the office. After about three months I was dissatisfied with the lack of attention which my son received and I complained about it. Six months ago the surveyor partner left the firm, and three months later the other pupil completed his articles and left. My lad was then in the office alone and was often days without any set course of study or work being given to him. I made a further protest and demanded to see what work, if any, the firm had in hand. This was refused to me, and on my threatening to withdraw the lad was told a police summons would be issued if I did so. An office boy was then engaged, but otherwise matters are as before. (1) Can the firm prevent the removal of the lad, or make any claim for damages? (2) Can I sue them in the county court for breach of contract and return of premium (£52 10s.) or a part of it? Does the amount make it one for a jury, or can a verdict be given by a judge? (3) Would the cancelling of the indenture imperil his status as an architectural pupil, and would the period already spent count as part of the three years' course required of a R.I.B.A. pupil?"

The right course to adopt is to consult a local solicitor, to whom the "articles" could be shown, and who would appreciate their exact wording. Basing my reply, however, upon what occurred under somewhat similar circumstances when the pupil was a solicitor's son, I would say: (1) The firm, if proved to have broken contract, could not prevent the pupil's removal nor claim for damage or loss unless they can prove that work is shortly coming into the office upon which his now partially trained help would be valuable. (2) Certainly the whole could not be claimed unless actual damage could be proved, as nearly half the time has been served. This would enable the decision to be given by a judge. (3) Some difficulty might be experienced in getting into another office, but the time already served would certainly be counted. The R.I.B.A. does not insist on any particular period.

G. A. T. M.

Making Measured Drawings at Chester Cathedral.

SALE. — MANCHESTER writes: "I intend visiting Chester Cathedral in order to prepare measured drawings for the Institute examinations, but I am doubtful whether any very good subjects are to be found there. I should be glad if you could name some suitable door, window or arcade. If you think Chester unsuitable, kindly mention some good Gothic examples in the neighbourhood."

Chester Cathedral is not one of the finest in England, but it undoubtedly contains subjects which are suitable for measurement as testimonies of study for the R.I.B.A. examinations. Probably the choir triforium would be the best piece, but special permission from the dean would be necessary, and its measurement might be difficult even with the aid of long measuring rods, tape and plumb-bob. The groining in a passage out of the cloisters is a good specimen of a peculiar form of thirteenth-century vaulting, with an additional rib between the cross springer and the wall and between the cross springer and the pier rib, with longitudinal and cross rib at the point of the arches which does not run to the wall, being stopped by the intermediate rib. There is also an Early English staircase in the refectory (now the grammar school) leading up to a large niche or sort of pulpit for the reader, to measure which special permission from the headmaster would be necessary. The chapter-house is another of Chester's peculiarities, and would be hardly so difficult to measure as some others, being a parallelogram on plan. If the drawing be wanted for the Intermediate examination, it would be best to measure the arch between the choir and the lady chapel as an example of Early English, and one of the nave arches as an example of Decorated work, both being excellent examples; while the west front contains enough Perpendicular detail to satisfy the most exacting.

G. A. T. M.

Right of Adjoining Owner to Close Passage.

WALES.—NEMO writes: "A house (belonging to A.) has on one side a flight of stone steps leading from one road to another. Abutting on these steps are two doorways and a window (ancient light). On the opposite side of the steps is a boundary wall (B.'s) 3ft. from A.'s house. A. now wishes to build up the lower of the two doorways, but also desires to preserve his right of access. He also wishes to fill up an ancient window and raise it above the boundary wall. Can B. prevent him? A. has no other access to his property other than by the steps in question, but he has used this right for more than fifty years without interference, and the public have also used the steps for the last thirty-six years. B.'s boundary wall has no doorway in it. He now claims possession of the steps and threatens to close each end by a door. Has he any right to do so?"

From our correspondent's letter it would appear that both A. and the general public have exercised an undisturbed right of way over the passage formed by these steps for at least thirty-six years, during which period it is presumed that B. has never erected any temporary barrier or other obstruction. At the same time, it is not understood for what purpose a door was erected at one end of the passage unless intended as a barrier against the use of the passage by the public. In the event of B. proceeding to block up this passage by erecting a wall or locked door at one or both ends, then A. should claim a right of way for the occupants of his house (and also his tenants in the adjoining houses if necessary) over the steps into both roads. The best course would be to consult a good local solicitor and act on his advice in instituting legal proceedings against B. The local authority should similarly maintain any claim for public right of way which may have been obtained, if the steps form a convenient and important means of communication between the two roads. As regards the passage door, it may be that the local authority committed an act of trespass in erecting it if B. is in a position to prove that the steps form a portion of his freehold property. If the passage steps are B.'s freehold property—or even if there is any doubt about the question—then A. had better not build up his old doorway if he wishes to retain his present rights of access to the same. A. cannot remove his ancient light to another position, for his prescriptive right of light over B.'s property relates only to the present position and size of the existing window openings. Should A. decide on closing his ancient light and forming another window opening at a higher level, then B. can construct a hoarding on the boundary of his property immediately opposite the new window in order to prevent A. obtaining any right of light from his property. In this case the hoarding might be placed in close proximity to A.'s window, or it may be necessary to place it at a distance of 3ft. away, according as to whether the steps are B.'s property or not.

T. E. C.

Platform for County Hall.

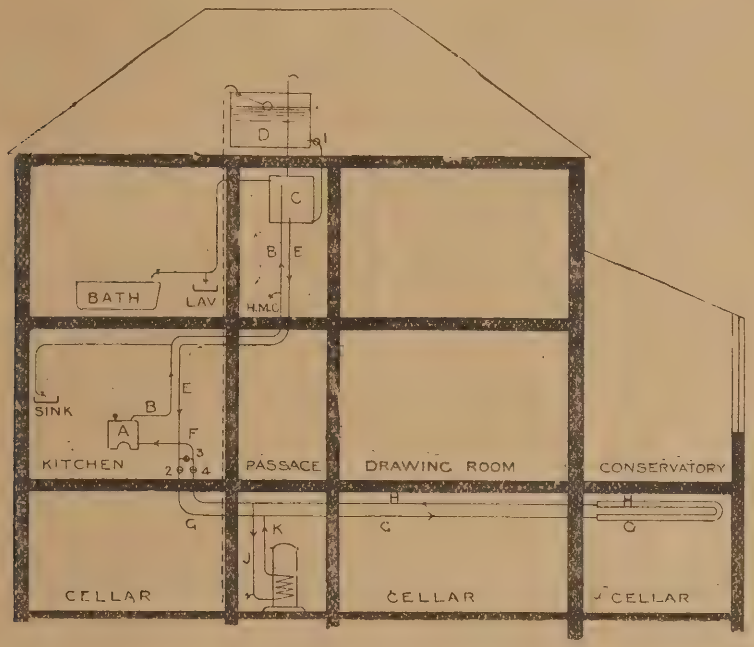
ELGIN.—MAC writes: "What is the proper height for the platform of a county hall in which theatrical performances are given? What is the best slope, the floor of the hall being dead level?"

The platform should slope back so that a person seated in the front row of the audience may see the whole of the platform floor, and the front should be somewhat above the eye level of a person so seated. If the front row of seats be close to the platform the height of the latter in front should not be more than 4ft. 3in.; but if a space for orchestra be provided then it might rise to 4ft. 6in. or 4ft. 8in. with advantage, as otherwise a well for the orchestra will have to be provided in order that the performers' heads may not obstruct the view of the stage, and their moving violin bows be seen, to the irritation of the audience. G. A. T. M.

Rainwater for Domestic Uses.

Maidstone.—Alpha writes: "(1) Which is the cheapest satisfactory method of filtering rainwater for domestic use? (2) What storage should be allowed per head (two w.c.'s, three sinks and one bath) for a country-house entirely dependant on rainwater? (3) Is there any reliable authority to which I can refer?"

(1) For particulars respecting the storage and filtration of rainwater for domestic purposes, see the Builders' Journal of September 26th, 1900, page 157. (2) The average consumption of water in country houses is from 18 to 24 gals. per head per day. The storage capacity to be provided must be governed by local circumstances. In rainy districts a storage capacity of 90 to 100 days' water-supply might be sufficient, whilst in a very dry locality it may be necessary to provide from 150 to 200 days' supply. Under ordinary conditions, a storage capacity of 100 days' supply calculated on a consumption of 20 gals. per head per day will generally prove adequate. (3) Consult No. 4 of "Specification" (published at these offices, price 5s. nett.) for further information on the subject of water-supply, &c. T. E. C.



SYSTEM OF HOT-WATER HEATING.

Co-operative Builders.

Kingston-on-Thames.—W. H. G. writes: "Do you know of any firms of builders who work upon a co-operative or profit-sharing scheme among their employees?"

The Co-operative Builders, Ltd., are well-known and do a large amount of business. The Carpenters' and Joiners' Society in Hull recently started a works department which has been very successful, and the society is being urged to form several others in large towns.

The Cement Combine.

Dublin.—W. C. L. writes: "Kindly name a few cement manufacturers who are not in the amalgamation."

The names of those in the combination will be found on the back cover of our issue for July 18th, 1900. The rest can be obtained from directories.

Books on Architecture and Engineering.

Redruth. — Anxious writes: "(1) What book would you recommend as giving the essential differences between the various styles of architecture (ecclesiastical and domestic), with details of mouldings, &c.? (2) Please also name a book on mechanical engineering. (3) You have also constantly recommended Leaning's book on quantity surveying. Is it preferable to Fletcher's?"

(1) Banister Fletcher's "History of Architecture" (14s.). (2) "Handbook for Mechanical Engineers," by Professor Henry Adams (7s. 6d.). These can be obtained from Mr. B. T. Batsford of 94, High Holborn, W.C. (3) Fletcher's "Quantities" is a very good book; Leaning's is larger and more expensive, but more complete and the most recent on the subject.

Land Registration Acts.

Liverpool.—Registration writes: "Can you give me any information and advice as to the operation of the Land Registration Acts (Lord Westbury's Acts) on the following points? (1) Could the title of a few acres of land be registered in such a manner as to be easily divided into small plots without the expense of investigating the title of each? (2) Has every subsequent mortgage or charge to be registered? (3) I understand the authorities at Somerset House take many months to register a title, and because of this it is of little practical use. What is the usual time it takes to get a certificate of registration if the title is clear and undisputed? (4) What are the objections to having land registered, and why are the Acts so seldom made use of?"

Replying to the heads of enquiry seriatim—(1) When a title is once registered the necessity for investigation ceases to exist, because Government has granted the holder of the certificate an indefeasible title (that is to say, a title good against all comers). There is no trouble in subdividing into small plots; all that has to be done is that vendor and purchaser should execute the "instrument of transfer" (all forms supplied on application to the Land Registry) in the same way as deeds are usually executed, and to send up with it a plan of the plot that it is proposed to transfer. I have many times recently sold plots in this way, and completed the whole transaction within a week. It will be found convenient to use lithographed maps of the estate as originally registered (get them approved by the Land Registry Office once for all) and upon the occasion of each sale simply add the sold plot to one of the lithographs. (2) Every subsequent mortgage or charge must be registered, forms being supplied by the Land Registry Department for that purpose. (3) This work is not done at Somerset House, but at the Land Registry Office in Lincoln's Inn Fields, and certainly my experience has been that the cost of the *first* registration is rather heavy, and the investigation of title very searching: consequently it takes a long time. This must I think needs be so, because if Government is going to grant an absolute indefeasible title it is only right that they should take care that justice is being done. In this connection I may say that an absolute title does not mean that if a claimant should succeed in ousting an owner with registered title that owner should be compensated by Government for his loss—what it does mean is, that *no one can come and claim* to go behind a title when once registered. (4) The cost and trouble of this first registration appear to me to be *the* great drawback; but I think also that one great reason that the Acts are so comparatively seldom made use of is that most people, knowing next to nothing of land transfer, leave everything (very rightly as a rule) to their solicitor, and he caring little for this "new fangled notion" perhaps carries out the business by means of a conveyance in the usual time-honoured way. It would be well for "Registration" (should he decide to avail himself of the Land Transfer Acts) to employ a solicitor who has had experience of this particular work, and I should be happy to refer him to such a man if he so desire. I do not know if it is still procurable, but Messrs. Cassell & Co. published, under the auspices of the "Cobden Club," in 1893, a very good pamphlet on the "Transfer of Land by Registration of Title," by J. R. Colquhoun Dill, price 6d.; but the procedure of land transfer has been simplified in many ways since that date. G. S. M.

Renaissance Buildings in and around Oxford.

London, N.W.—Student R.I.B.A. writes: "What Renaissance buildings in or near Oxford would you recommend to measure for the R.I.B.A. Final Examination?"

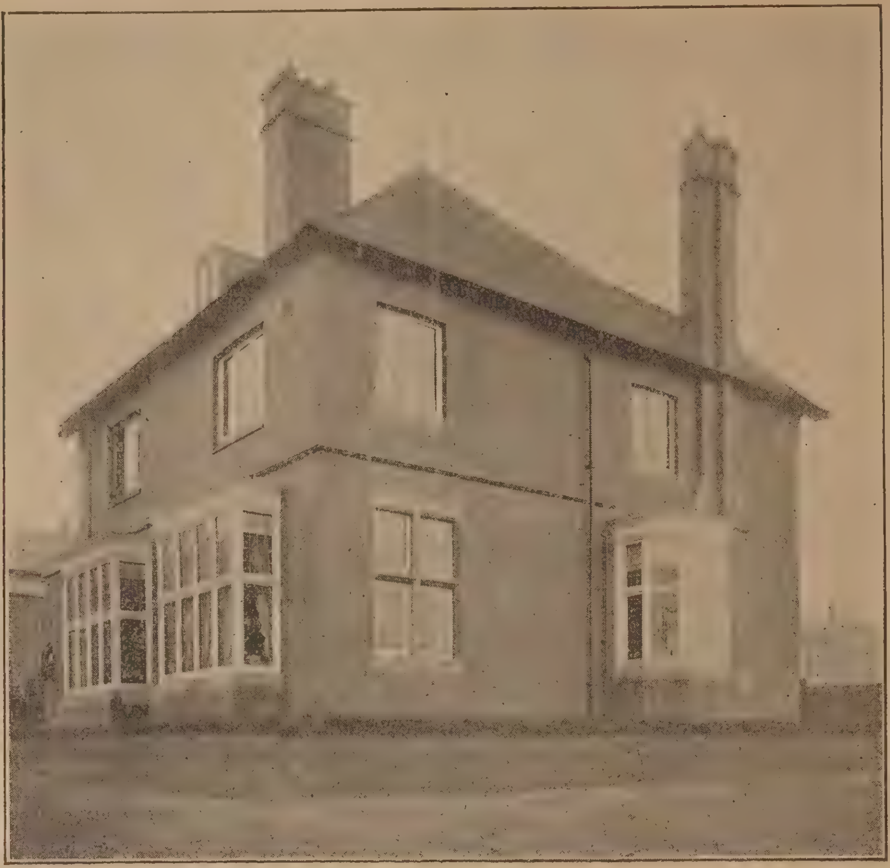
I would suggest Burford Priory, Burford, or the chapel of it. In Oxford, the Ashmolean Library. REGINALD BLOMFIELD.

Level of Heating Apparatus.

London.—T. H. writes: "In the designing of a house which it is proposed to heat by hot-water with radiators the question has arisen whether the boiler must be in a basement or if it can be on the same floor as the rooms to be heated. If the boiler is on the same level, will the result be satisfactory?"

It is decidedly better to have the boiler in the basement, but it is not absolutely necessary; *e.g.*, the writer designed and had fitted up in his own house the following arrangement of hot-water pipes (shown diagrammatically by the accompanying illustration), which has worked satisfactorily for some years. A is a boiler at the back of the kitchen range, with safety valve. B is the flow pipe to the hot-water cistern C, and branched to sink, with a draw-off tap in housemaid's closet. From the top of this cistern a branch leads to the lavatory and bath, and an expansion pipe into the roof. From the bottom is the return pipe E. In the summer the valve 3 being opened, and 2 and 4 closed, the return takes the short circuit to the boiler through the valve 3. In the spring and autumn the valve 3 is closed, and the valves 2 and 4 are opened; the return is then made by way of the pipe G round the conservatory and through H and F to the boiler. In the winter, when more heat is required, the Kinnell's "Acme" boiler in the cellar is set to work to assist the kitchen boiler, the course of the current then being E G and K G to H F and H J; or the valves 3 and 4 are opened, and the valve 2 closed, to give two independent circulations: the valve 4 is left open to allow the expansion of the water in the lower pipes. The cold-water supply is from the cistern D to C, through the valve 1, which is only closed in the event of repairs. In another case with which the writer was concerned the boiler was on the same floor as the radiator for heating a clubroom, and the result was satisfactory. HENRY ADAMS.

A New Masonic Hall at Leeds was opened on Monday last. Mr. J. M. Bottomley is the architect, and Mr. J. T. Wright the chief contractor. Red brick has been used for the frontage. On the first floor is a dining-room capable of accommodating 400 persons; the principal lodge-room is on the second floor.



"CRAIGMONA," HALTON, NEAR LEEDS. ALBERT E. DIXON, ARCHITECT.

STONE AND WOOD AS BUILDING MATERIALS.

In the course of an article on "Constructional Material" which recently appeared in the columns of the "Morning Post" Mr. W. E. Martin says:—

"The limestones furnish ordinary and hydraulic limes, as well as an immense number of building stones, from the Bembridge of the Tertiary rocks to the Coniston limestone of the Upper Cambrian chalk. Purbeck stone, Portland stone, Bath stone, inferior oolite, lias, magnesian limestone, carboniferous limestone, Great Devon limestone and Wenlock limestone—all belong to the series, which represents a lapse of time of probably over three hundred million years. The sandstones have several representatives, from the 'firestone' of the secondary rocks to the flags and massive grits of the pre-Cambrian.

The Durability of a Stone.

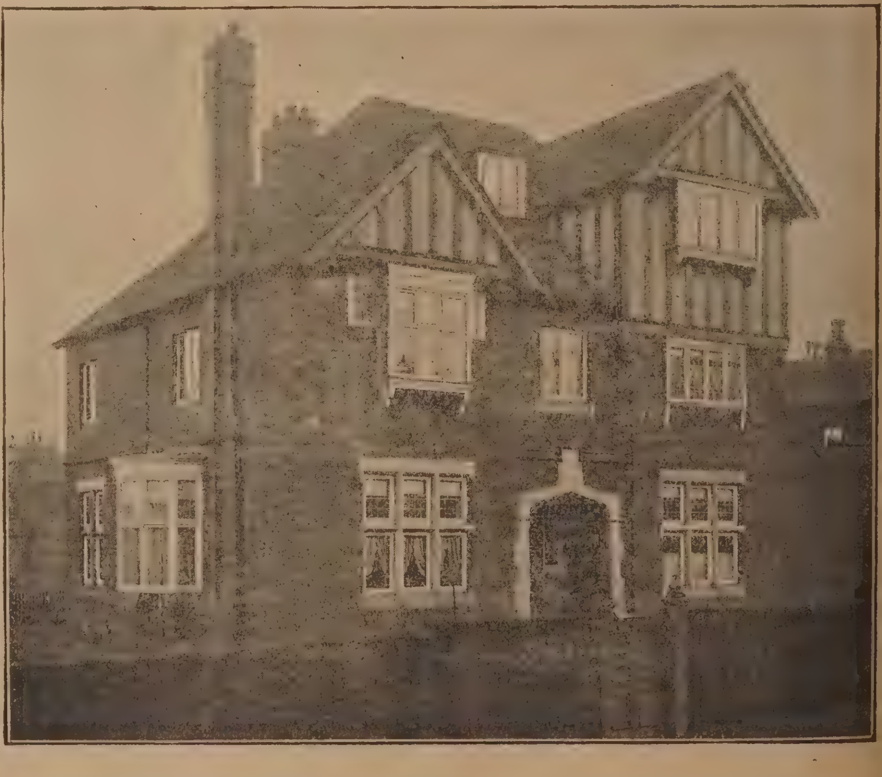
"It is asserted dogmatically by one that the porosity of a stone is a measure of its durability, despite the fact that in the same building, side by side, a stone absorbing water to the extent of three-eighths of a pint to a cubic foot may be seen in rapid decay with another material in good condition which absorbs no less than twelve pints to the foot. Another asserts that specific gravity is a measure of durability, forgetting that even granite weighing 171lb. to the cube foot will sometimes decay more rapidly than a porous limestone (travertine) weighing only 88lb. Again, chemical composition is credited with having much to do with the weather-resisting quality of a stone. But this theory fails, for of the two nearly pure limestones, Bath stone and carboniferous limestone, some beds of the former scarcely last out the completion of the building in which they are used, while the latter, fresh with the mason's tool marks, may be seen in the pre-historic round towers of Ireland. It follows, then, that neither porosity nor weight nor resistance to strain nor chemical composition is alone to be considered in judging the durability of a building stone. A series of experiments conducted by the writer has convinced him that the physical condition in which the component minerals exist in a stone has much to do with its durability, and taken into consideration with the various properties enumerated above it has everything to do with it. The ring of a stone under a chisel struck smartly with a heavy mallet is a good index to its weathering properties, for it tells of the physical condition in which the materials exist in the stone; and an intelligent workman being consequently in an unique position to decide on the goodness or badness of any stone which may pass under his hands, he should be relied on in this matter by whoever takes an interest in erecting a durable building."

Wood Construction.

Speaking of timber, the writer continues: "It may safely be said that less is known of the structure and properties of timber than of any other material which passes through the builder's hands. This ignorance is frequently shared by the architect, who is apparently indifferent as to whether the wood used under his superintendence is likely to last a reasonable time or perish by premature decay. When about the beginning of the sixteenth century the use of oak was gradually being abandoned in this country, hewn pine logs, cut from large trees grown in the provinces bordering on the Baltic, were imported to replace the home-grown timber. This has since completely superseded oak in all our public and private buildings, but when it was first introduced great prejudice existed against its use, for workmen could not be made to understand that a roof of it would answer the purpose nearly as well as oak and be much cheaper. True, now that the tide of public opinion has set the other way no one thinks of using oak, except occasionally in churches, any rubbish shipped from Sweden, Russia or Canada being good enough for the jerry-built structures found in all our towns.

Deterioration.

"To gauge the change in this respect one has only to try to realise what the difference is between a piece of 'heart of oak' and an 'inferior fifth' quality of Swedish deal, a by no means uncommon class of building timber at present. Soon after the removal of the timber duty (in 1866) the country was flooded with foreign sawn scantlings, chiefly planks, deals and battens, which varied in size from 11in. by 4in. to 7in. by 2½in., and these largely displaced the logs hitherto sent, for they saved sawing and were consequently cheaper than the same sizes cut from logs here. This flood of foreign sawn timber continues to increase, while the sizes of scantlings diminish, and the quality of the timber goes from bad to worse. Logs of reasonable size must be cut from well-grown large-size trees, but a 4in. by 2in. rafter can be and is cut from a scaffold pole nearly all sapwood. On many scantlings, including flooring boards, the bark may be seen where the corners are 'waney' and do not hold the full-size specified, which is another growing fault with these imported pieces. In fact, this marked deterioration of foreign sawn timber is so well known that it is rigidly excluded from many important works, and such timbers only allowed which are cut from large logs especially selected as free from sap, shakes and large knots."

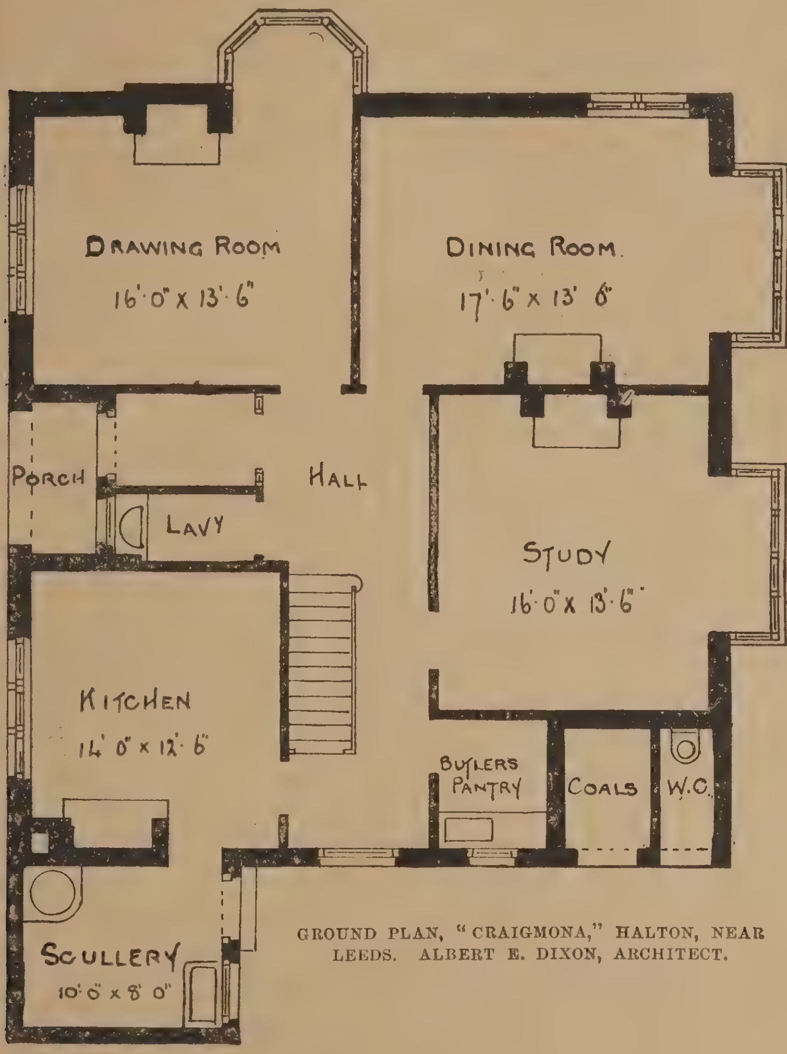


"CRAIGMONA," HALTON, NEAR LEEDS. ALBERT E. DIXON, ARCHITECT.

THE LATE MR. ROBERT FERGUSSON, OF ABERDEEN.

MR. ROBERT FERGUSSON, late of the Aberdeen Granite Works, and long associated vith the old firm of Messrs. Macdonald, Field & Co., died recently in his eighty-third year. Mr. Fergusson was born at Balbrodie, parish of Blair Athole, Perthshire, on May 1st, 1819. In 1841 he came to the Aberdeen Granite Works, then being carried on by Messrs. Macdonald & Leslie. Mr. Fergusson having worked for rather more han a year at polishing, was in June, 1842, engaged to serve four years as apprentice mason, three years as a dresser, and one as a builder, as the rule of the trade then was. On the same day as Mr. Fergusson, the late Baillie Mitchell was indentured as an apprentice, and after having been scarcely two years at the trade hey were sent to Castle Street to dress the pedestal for the granite statue of the Duke of Gordon about to be erected there. This task the young men accomplished in three weeks, this being considered at the time a notable feat. When his four years' apprenticeship were completed he was handed his minute of indenture; and in March or April, 1845, as Mr. Leslie had no building jobs in Aberdeen, the young journeyman was sent to Dunrobin Castle, the firm having secured the contract for the erection of hat fine building. Mr. Leslie was the architect and the work was admirably executed. For about twelve months he was engaged on the building, and thereafter he acted as clerk and imekeeper until the spring of 1849. During the emainder of that season he took part in the rection of the Polmuir railway viaduct. Such was the confidence of the firm in Mr. Fergusson as a careful and skilful workman that his abilities were recognised by his being appointed oreman of the masons towards the end of the ear, the old foreman, Mr. James Don, retaining he charge of the polishing. Mr. Don having died in 1853, Mr. Fergusson was appointed to the oversight of both departments, chiefly under Mr. Macdonald, the original founder of the firm. Mr. Leslie left the firm in 1855, and Mr. Fergusson had practically the sole charge until the death of Mr. Macdonald, senr., in 1860. The knowledge which Mr. Fergusson had acquired of the business stood him in good stead at this critical juncture of affairs. Under Mr. Macdonald's trustees Mr. Fergusson, in conjunction with the late Mr. A. Macdonald, jun., carried on the works for about three years. In March, 1863, Mr. Field joined Mr. Macdonald, Mr. Fergusson was assumed as junior partner for ten years, and the firm became known under the title of Alexander Macdonald, Field & Co. New life was thrown into the constituent parts of the establishment, and during this period the works in Constitution Street were nearly wholly reconstructed and various modern improvements were adopted. During a second term of ten years of the partnership the works were still further extended. Mr. Field retired at the expiry of this second period, namely, in March, 1883, and Mr. Macdonald, jun., and Mr. Fergusson continued to carry on the work until the death of the former at the end of 1894. After the death of Mr. Macdonald, therefore, Mr. Fergusson was the only remaining partner of the firm.

A limited liability company was formed on February 3rd, 1885, and Mr. Fergusson was appointed managing director.



GROUND PLAN, "CRAIGMONA," HALTON, NEAR LEEDS. ALBERT E. DIXON, ARCHITECT.

"Craigmona," Halton, near Leeds, was lately erected for R. Haste Carr, Esq. It is built with red-pressed brick, stone dressings and red tiled roof. The sitting-rooms are so arranged as to obtain a fine view of the surrounding country upon the north and east sides. The south and west have not a good prospect. The architect was Albert E. Dixon. 5, Park Lane, Leeds.

Keystones.

A Bust of Paul Verlaine, by Rodin, is proposed to be erected in the Square des Batignolles.

Public Slipper-Baths at Leeds are proposed to be erected in the West Hunslet Ward at a cost not exceeding £1,500.

New Hospital for Bury.—The foundation stones of a new hospital for the treatment of infectious diseases were laid at Bury recently. The architects for the new hospital, which is to cost about £20,000, are Messrs. Pole & Little, of Gray's Inn Square, London.

Broad Sanctuary.—The Earl of Pembroke in reply to a question in the House of Lords said that the First Commissioner of Works would open to the public and furnish with seats under or around the trees therein, a portion of the enclosure in Broad Sanctuary which lies to the south of Canning's statue, and the branches of the trees would be thinned to render the statue visible.

Lichfield Grammar School. — The foundation stone of a new grammar school at Lichfield was laid last week. The Conduit Lands Trust have given the site of eight acres and made a contribution of £4,500. Special attention has been devoted to perfecting the scientific and technical departments. The whole expenditure is estimated at more than £9,000. The new premises, however, are only part of a larger scheme which will be carried out later should the school succeed. The projected buildings will afford accommodation for 125 boys, with 22 resident scholars, and comprise residences for the headmaster and assistant masters.

The Boadicea Group at Westminster.—Two years ago scaffolding was erected on Westminster Bridge, opposite the Houses of Parliament, for the purpose of erecting the pedestal of the Thornycroft Boadicea group in bronze, the gift of the sculptor to the County Council. The scaffolding remains there still, and for some time has been deserted. Six months ago the grey granite pedestal had been erected, but then, strange to say, workmen commenced to demolish it, and now huge blocks of granite are piled one upon another promiscuously, undisturbed by the sound of mallet or trowel. Clearly something has gone wrong.

Cost of London Board School Buildings.—The works committee of the London School Board, in their annual report just issued, give an abstract of the work done during the year ended March 25th last. The average cost of the sites for 440 schools, the accounts of which had been completed at September 29th last, was £7 2s. 6d. per child. The average cost per head of the buildings and furniture of these schools has been—school buildings (exclusive of sites), £14 9s. 2d., and furniture and fittings (such portion as is chargeable to capital account), 10s. 11d. Tenders have been accepted during the year for eight new schools providing accommodation for 7,430 children and ten enlargements of schools providing additional accommodation for 2,577 children.

The new nave of St. Michael and All Angels, Windmill Hill, Bedminster was dedicated recently. The tower has yet to be carried out. The new nave has involved an expenditure of over £5,000. The new building is of red brick with freestone dressings, and consists of a lofty nave with side aisles not carried to so great a height. Broseley tiles are used, and rising from a central part of the pitch of the roof is an ornamental ventilating shaft, while at the west end is a bell turret. A novel feature in the interior design is the introduction of rather massive square freestone columns to support the archways dividing the nave and side aisles. Windows in the clerestory and elsewhere are of tinted glass, the floor is laid with wooden blocks, and chairs are provided for 573 persons, making the accommodation of the church, with the chancel and side chapel, 625. Vestries for the choir and clergy are built on the north side and the baptistery is in the south-west corner of the church in a small apsidal chamber. The architect for the new work is Mr. John Bevan, St. Stephen's Chambers, Bristol.

A New Church at Quarnford, Derbyshire, is being erected. The building is Gothic in design.

The Calendar of the Glasgow and West of Scotland Technical College has just been published for the session 1901–2.

Change of Address.—Mr. Sam G. Thacker, late of S. J. Thacker & Son, surveyors, 22, Montague Street, Russell Square, has removed to 90, High Holborn, W.C.

A Monument to the Memory of Schumann has just been erected in Zwickau, Saxony. The great musician is represented sitting in pensive mood with his head resting on his left hand.

A Tablet in Maryculter Parish Church, Aberdeen, has been erected to the memory of the late Rev. George Duncan. It was designed by Mr. Macgregor Chalmers, architect, of Glasgow.

New Public Baths at Bradford are proposed to be erected on sites in Morley Street and Drummond Road at a cost of £53,000. A Local Government Board enquiry was held last week.

The Bowling-green of the Famous Old "Bell" of Edmonton has recently been granted by the Cordwainers' Company to the Rev. Lucius Fry, vicar of St. James's, Upper Edmonton, as a site for a parish hall and other rooms, to be used for church and settlement purposes.

"Canada: Its History, Productions and Natural Resources" is the title of a book that has just been published by the Department of Agriculture of Canada in connection with the Glasgow International Exhibition. It is excellently got up and contains several useful maps of Canada.

Competition at Old Trafford.—The awards in the open competition for public baths and managers' residence at Old Trafford, near Manchester, have been made as follows: First premium of thirty guineas to Charles T. Taylor, Oldham, and Arthur Warburton, Warrington, joint architects; secoud premium of twenty guineas to Arthur R. Groome, A.R.I.B.A., 2, St. Peter's Square, Manchester; third premium of ten guineas to Farrar & Woodhouse, Ilkley.

Strand Improvement Scheme: "Gaiety" Plans adopted as a Basis.—Mr. Runtz recently submitted the plans for the new Gaiety Theatre and Restaurant to the Council. Mr. Norman Shaw, R.A., suggested a different structural treatment. He submitted a sketch design to Mr. Runtz, who at once fell in with the idea and redrew his designs to accord with it. This new design, the result of the combined skill of Mr. Shaw and Mr. Runtz, has been approved by the Improvements Committee. Other buildings will be made to fall in with the new Gaiety, which will thus set the keynote for the whole of this vast improvement.

The New Trinity Congregational Church, Leeds, is being erected. The building, which occupies a conspicuous site in Woodhouse Lane, is in substitution of the East Parade Chapel, which was sold to an insurance company for £31,000, and which, being in the centre of the city, became practically disused. The new edifice, which is estimated to cost £25,000, is from a design by Mr. C. F. Danby. It was shown in the Royal Academy this year. About 1,000 people will be accommodated. The memory of three former pastors, the Rev. John Ely, Dr. H. R. Reynolds and Dr. E. R. Cuder, is to be perpetuated by a memorial window at a cost of £300.

A New Mission Hall at Oxford is being erected. The new building will be set back from the road about 24ft. It will have a frontage of 30ft. and will be built of white brick with Bath-stone dressings. The style will be Gothic. The hall will be 60ft. by 24ft. 6in., with a height of 24ft., and is to accommodate 400 people. The walls will be matchboarded to a height of 5ft., the floor will be of wood blocks, and in the roof will be lantern lights. Two aisles up the hall lead to doors which give entrance to the schoolroom. This room will be of the same breadth as the hall, and will be 32ft. long. Behind the schoolroom will be the vestry, a kitchen and other offices. There will be an entrance to the roadway leading to Stanley Road. The building is being erected by Mr. Phipps, builder, of Norrey's Avenue, from plans drawn by Mr. J. C. Gray, of 5, Blackall Road. The total cost will be about £900; £410 has been given and promised.

The Bourse, Paris, is being enlarged by lateral wings, thus making the building cruciform.

The Parish Church of Radley, near Abingdon, is to be structurally repaired at a cost of about £1,000.

A New Wesleyan Church at Walsall Wood is being erected at a cost of over £2,000 from plans by Mr. C. W. D. Joynson, Wednesbury.

A New Parish Hall at Clapton is being erected in connection with the church of St. James the Great.

A Memorial Fountain to the Stewardess of the "Stella," the late Mrs. Mary Anne Rogers, was unveiled on the Western Esplanade at Southampton on Saturday last. The cost was £320.

A New Mission Church for the Parish of St. Mary's, Swansea, was opened recently. It is dedicated to St. Philip, and was formerly a Nonconformist chapel. It held about 300 persons.

A Statue of Pasteur is to be erected in Arbois, his native place. It is the work of Daillion, and represents the great man of science seated in an armchair bareheaded, wearing a frock coat and holding an eye-glass in his right hand.

A New Vicarage House for St. Augustine's, Highgate, is being erected. Between £16,000 and £17,000 has been expended on the portion of St. Augustine's Church already built, and about £10,000 more is required to finish the church and erect a parish-room.

A New Fire Station for East Greenwich is being erected at the junction of Horn Lane and Tunnel Avenue with Lower Woolwich Road, East Greenwich. The cost of the site, which has been acquired from the County Council itself, was £750, and the estimated cost of the building, which is being erected by the works department of the council, is (including £1,000 in regard to the special difficulties of the site) £13,100. It will accommodate in the way of appliances a steamer and a horsed escape, which latter is capable of travelling at the rate of a mile in five minutes and to carry four men. The first storey is to be built in Portland stone and the other two in red bricks. There will be stabling for four horses, watch- and recreation-rooms, and for firemen two sets of three rooms each and one of two rooms.

Assyrian Antiquities.—Another archæological expedition to Sendjirli, in the North of Syria, will be sent by the Berlin Oriental Society about the end of this year, under Professor von Luschan, of the Ethnological Museum. The ruins of the ancient capital of the Kingdom of Shamal, situated near the Kurd village of Sendjirli, were discovered by Drs. Puchsteine and Luschar in 1883, and thoroughly examined by several expeditions from 1888 to 1894 at the expense of the Berlin Oriental Society. The most ancient finds date as far back as about two thousand years before Christ, and consist of some Hittite antiquities, a statue of King Panamma (745 to 727), covered with inscriptions, and an Assyrian stele of Asarhaddon, about the year 670 before Christ. The examination of the tumulus covering the castle gate, which dates back as far as 1,000 before Christ, the castle itself, and the double well not being finished in 1894, the work is to be brought to a conclusion by the present inspection.

A New Sunday School at Huddersfield is being erected in the parish of St. Mark's under the superintendence of Mr. W. Cooper, architect, of 4, Kirkgate Buildings. The building will be in plain Gothic style, and there will be a central hall, with four classrooms and cloakroom in the front block, which will be two storeys high, and two classrooms at the back. The central hall will be 56ft. long, 35ft. wide, and the classrooms will average 12ft. 6in. by 12ft. and will be 9ft. 6in. high. The large hall will accommodate about 350 persons. The premises will be ventilated, lighted and heated on the latest principles. The contractors engaged in the work are as follows: Masons, Messrs. William Mallinson & Sons, Lockwood; joiners, Messrs. Ben Hirst & Sons, Spring Street; slater, Mr. W. E. Jowitt, Fitzwilliam Street; plasterers, Messrs. J. Milnes & Sons Commercial Street; painters, Messrs. Lunn & Cardno, High Street; plumbers, Messrs. George Garton & Sons, Market Place; and electricians, Messrs. Crossley & Bould, Cloth Hall Street.

A Kursaal at Southend was opened last week Its central hall accommodates 5,000 persons.

The death is announced of Mr. Yeoville Thomason, the architect of the Jewish synagogue at Birmingham.

As a Memorial to the late Rev. B. W. Kerr-Pearse, who for thirty-six years was rector of Ascot, new choir stalls have been placed in the chancel.

Mr. Fred Holland has been appointed architect and civil engineer to the Bradford Board of Guardians for a period of four years.

Two Stained-glass Windows have been placed in Holy Trinity Church, Hartlepool, in memory of the late Rev. E. Shaw, M.A., for twenty-nine years vicar of the parish.

The Parish Church of St. Leonards-on-Sea has recently been enriched by the addition of a stained-glass window in memory of Frederick Richards, J.P.

A Stained-Glass Window has been erected in St. Alphege Church, Canterbury, in memory of Alderman William Mount, a former mayor of Canterbury. It is in the north aisle.

Beverley Minster.—A new peal of ten bells has been hung at Beverley Minster. These replace an old peal of eight. Their weight is 166cwt. 8qr. 2lb.

At St. John's Roman Catholic Church at Beverley a new statue of St. John of Beverley was unveiled recently. The statues of St. John of Beverley fixed in the interior, and of the Madonna and Child on the exterior, have been executed by Mr. Robert Smith.

The Rebuilding of the Old Bailey.—Mr. Ross, the city engineer, replying to questions at a recent meeting of the Corporation of London said nothing further had been done in reference to the rebuilding of the Central Criminal Sessions House, and no steps had been taken towards widening Newgate Street to 60ft wide.

Christ's Hospital Bill: Council's Clause Rejected.—In the House of Commons last Friday the Christ's Hospital Bill came back from the Select Committee, to which it was referred, with an additional clause inserted by the Committee giving the London County Council a right of pre-emption for four months after the passing of the Act. On a division the clause was cut out.

St. Mary Woolnoth: Arbitrator's Award.—Mr Vigers has issued his award on the question of compensation claimed from the City and South London Railway by the churchwardens of St Mary Woolnoth, which is being practically acquired by the company for a new station The arbitrator decides that if the church remains on its present site the company must pay £90,628, but if at some future time the site becomes available for building purposes this amount must be increased to £143,548.

Puccini, the Italian composer, has commissioned the well-known artist, Signor Nomellini, to paint the scenery for his new Japanese opera. The precedent is one which might well be followed elsewhere. In this country scene painters, with a few famous exceptions, hardly deserve to rank as artists, and the work they do is often of indifferent quality. If artists of ability were called in, not merely to design scenery, as they are sometimes, but actually to paint it, some of the conventions which hamper the progress of art upon the stage would disappear.

The Cost of the New City Hospital, Edinburgh.—At last week's meeting of the Edinburgh Town Council the city superintendent of works submitted a report as to the probable cost of Colinton Mains Hospital. It set forth that the contracts on estimates accepted under sanction of the town council amounted to £271,621, and that the probable cost of remaining works required for the completion and equipment of the hospital was £62,250—together, £333,861. At an early stage the probable cost was stated at £37 per bed, later the cost was found to be little less than £400 a bed, but finally the figure had reached £556 per bed.

Property and Land Sales.

ROYAL AGRICULTURAL SOCIETY'S SHOW.
Cardiff Meeting, 1901.
By Order of the Council.

THE SALES by AUCTION of the valuable PLANT, TIMBER BUILDINGS, and other Materials used in connection with the Show, and which have been purchased at a cost of between Twelve and Fourteen Thousand Pounds, have been fixed for the following dates:—

1st SALE—
THURSDAY and FRIDAY, 25th and 26th JULY, 1901.
2nd SALE—
THURSDAY and FRIDAY, 1st and 2nd AUGUST, 1901.
3rd and LAST SALE—
THURSDAY and FRIDAY, 15th and 16th AUGUST, 1901.

STEPHENSON and ALEXANDER,
5, High Street, Cardiff. Auctioneers.

Important Sale of Builder's Plant and Stock.

MESSRS. FULLER, HORSEY, SONS, AND CASSELL are instructed to SELL BY AUCTION, in Lots, on the Premises, STATION BUILDING WORKS, ANDOE ROAD, CLAPHAM JUNCTION, S.W. (the premises having been acquired by the Railway Company), on WEDNESDAY, AUGUST 14th, 1901, at ELEVEN precisely, BUILDER'S PLANT and STOCK, including 200 dozen scaffold cords, 3,000 scaffold boards, 1.500 poles, 2.000 putlogs, 50 navvy barrows, 700 wheeling planks, 20 fathoms poling boards, steps, trestles, tanks, jacks, weighing machines, smiths' and fitters' tools, 20 standards planks, deals and battens 100 squares pitch pine and oak flooring and matching, 10 loads mahogany, walnut, wainscot, oak, teak, and white wood, 2,000 feet run oak cills, 20 loads new dry boards, quartering, and cut stuff, 3 loads English oak plank, 50 loads Dantzic and useful timber, 25 tons bar iron and useful builder's iron work, 20,000 bricks, slates, tiles, &c., quantity of drain pipes and sanitary ware, quantity sashes, doors, firewood, &c.; the Stock of a Wood-block Flooring Manufacturer, comprising 6 melting pans and tools, 100,000 feet run 3 by 2 and 3 by 1½ burnettised yellow deal quartering in course of preparation, large quantity of burnettised timber and flooring blocks, 2 horses, harness, 2 timber trolleys, cart, 3 hand-carts, stable utensils, and other effects.—May be viewed the day preceding, and catalogues had on the premises, or of Messrs. FULLER, HORSEY, SONS, & CASSELL, 11, Billiter Square, E.C.

FOLKESTONE, on the West Cliff Estate.—Notice of Sale of valuable Freehold Land (free from tithe and land tax), in a charming situation, near the stations, on the south side of and between the main railway line and the sea.—With possession.—Messrs.

DEBENHAM, TEWSON, FARMER, and BRIDGWATER have received instructions to SELL, at the QUEEN'S HOTEL, Folkestone, on MONDAY, AUGUST 26th, at TWO for THREE, in lots, 50 CHOICE FREEHOLD RESIDENTIAL BUILDING SITES in a lovely position, about 100 feet above the level of the sea, with frontages varying from 40 ft. to 100 ft. to Bathurst Road, Baldric Road, and Turketel Road, at the western side of the Leas and near the new Hotel Metropole affording an exceptional opportunity for acquiring good FREEHOLD SITES, suitable for the immediate erection of villas and modern marine Residences of a superior character, with gardens and stabling if desired. The roads are all 50 ft. wide and made up and metalled. The sewers and the company's water mains are in. There are great facilities in this beautiful neighbourhood for yachting, sea-fishing, bathing, hunting, and golf.—Particulars and plans of Messrs. TOOMER and CHILD, Solicitors, No. 35, Walbrook, London, E.C.; of ANDREW BROMLEY, Esq., Architect, Radnor Chambers, Folkestone; and of the Auctioneers, 80, Cheapside, E.C.

MISCELLANEOUS.

TO ARCHITECTS AND SURVEYORS.—An Old Established Country Practice for Sale in the South of England; good reasons for giving up same.—Address, ARCHITECT and SURVEYOR, Box 1736, BUILDERS' JOURNAL Offices, Effingham House, Arundel Street, Strand, W.C.

FOR SALE, Genuine Jobbing Builder and Decorators, Plumbing, Gasfitting, &c., and Building Materials Depôt in neighbourhood of Herne Hill. Established 12 years. Good front shop for Retailing Glass, Paperhangings, Ironmongery, &c. Side entrance gates for workmen. Workshops in rear. Large storage yard can be had if required. Cause of Sale, retiring from business. Price 375*l*. Strictest investigation courted.—Box No. 1727.—BUILDERS' JOURNAL Offices.

FOR SALE.—Old Established Plumber's and Decorator's Business, in good class growing neighbourhood, S.E.; good plant and stock.—Apply "Decorator," Box 1731, BUILDERS' JOURNAL Office.

GRAPHITE, Steatite, and Silica, for leasing on Royalty a vein of clay composed as above, suitable for forming into crucibles, tunnel bricks, &c. Excellent opportunity for any capitalist willing to erect the works.—Apply to the MANAGER, Aluminious Earth Works, Frongoch, Bala, Merionethshire, North Wales, for samples and fuller particulars.

R.I.B.A., Society of Architects, Surveyors Institute (Building Section), and Civil Service Technical Examinations. Preparation by correspondence or in residence.—MIDDLETON & CARDEN, 19, Craven Street, Strand, W.C.

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THE BEST & STRONGEST BELT FOR DRIVING IN HEAT, STEAM, DAMP, WATER, OR OUT OF DOORS.

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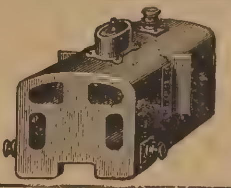

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APPOINTMENTS VACANT.

ARCHITECT AND SURVEYOR. An old established West-end Firm has VACANCY for an ARTICLED PUPIL; Moderate Premium.—HUKINS and MAYELL, 76a, Westbourne Grove, Bayswater, W.

RED BRICK, TILE and TERRA COTTA BURNER (thoroughly practical) WANTED. One who can burn greys preferred.—Apply, POULTON & SON, Adamantine Brick Works, Reading.

TIMEKEEPER.—WANTED, an experienced builder and contractor's TIMEKEEPER.—Apply, with full particulars as to age, experience, &c., to the MANAGER, L.C.C., Works Department, Belvedere Road, Lambeth, S.E.

ACTON DISTRICT COUNCIL.

WANTED, a CLERK in my office, well acquainted with prime cost, able to take out quantities and write specifications.

Salary. 110*l*. per annum, rising 10*l*. per annum to 160*l*.

Applications in own handwriting, with copies of not more than three testimonials, to be delivered here in sealed envelopes, endorsed "Surveyor's Clerk," not later than NOON on TUESDAY, AUGUST 6th. Duties to commence about the middle of September.

Canvassing members will be a disqualification.

D. J. EBBETTS, Surveyor to the Council.
No. 242, High Street, Acton.
July 24, 1901.

APPOINTMENTS WANTED.

ARCHITECT AND SURVEYORS' ASSISTANT requires SITUATION. Nine years' experience. P.A.S.I. Working drawings, specifications, quantities land and building surveying, &c.—H. A., Box 1732, BUILDERS' JOURNAL Office.

ADVERTISER seeks POSITION as CLERK in Architect or Surveyor's office; Shorthand (100); neat Tracer; Moderate Salary.—Box 1712, BUILDERS' JOURNAL Office, Effingham House, Arundel Street, Strand, W.C.

CARPENTER and JOINER wants piece-work. Carpentry taken throughout buildings; estimate free; town or country.—G., 19, Dartmouth Park Road, Highgate Road.

GENERAL FOREMAN seeks re-engagement through slackness of Trade; first class reference; good manager; practical in all branches; abstainer; aged 35. Builders' son. D. R., 62, Tubbs Road, Willesden Junction, N.W.

MACHINIST wants JOB. Town or country. Well up in trying-up and general joiner, thicknessing or planers.—Address, A.B. St. John's road Stables, Brixton.

PLUMBING, GAS FITTING, HOT WATER and Sanitary Work, Zinc Work; Labour and Solder only if required; all tools.—"PLUMBER," Avenue House, Hertford Road, Lower Edmonton.

SHOP FOREMAN seeks situation with a good firm. Can undertake entire supervision of all woodwork. References, &c.—WOODWORK, Box 1716, BUILDERS' JOURNAL Office, Effingham House, Arundel Street, Strand, W.C.

TIMEKEEPER and WAGES CLERK. 150 to 200 men. Used to all Auto's. Well up in measurements, quantities, &c. Highest refs.—GULLAND, 40, Pember Road, Kensal Rise.

TO BUILDERS.—PLASTERING DONE Satisfactorily at MODERATE PRICES. Town or Country. Good References.—Apply, G. LEWIS, 12, Matilda Street, Barnsbury, London, N.

TO ESTATE OWNERS.—ARCHITECT desires position as ESTATE AGENT or MANAGER. Well versed in Estate Development. Good manager of men, thoroughly practical, 25 years' experience. Good references.—To BOX 1718, BUILDERS' JOURNAL Office, Effingham House, Arundel Street, Strand, W.C.

WORKING FOREMAN CARPENTER AND JOINER seeks SITUATION on gentleman's estate. Late employer the Earl of Darnley.—F. J. ANSELL, Cobham, Gravesend.

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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

CROWBOROUGH (SUSSEX).—Accepted for the erection of a dwelling house at Crowborough, Sussex, for Mrs. Mackintosh, Mr. Charles H. Mead, architect, 8 Mortimer Street, London. W.:—

J. Marden, Church Road, Crowborough	£1,510

DERBY.—For the erection of Primitive Methodist church at Dale Road, Derby. Mr. F. S. Antliff, Draycott, architect. Quantities by architect:—

J. Young	£2,575	0	0
J. W. Chapman	2,340	0	0
A. Brown	2,315	0	0
G. Wagg	1,867	14	0
W. Edwards*	1,737	4	6

* Accepted.

DEVONPORT.—For the erection of business premises, Albert Road, for Messrs. Shears, Stroud & Stevens. Mr. Edgar M. Leest, architect, Public Hall, Devonport:—

A. Andrews	£1,195	0
J. Paynter	1,164	10
Jenkin & Son	1,100	0
W. E. Blake	1,067	0
T. May	1,022	0
G. B. Turpin	998	0
Wakeham Bros.,* Plymouth	993	0

* Accepted.

DRAYCOTT.—For the erection of isolation hospital at Draycott, near Derby. Mr. F. S. Antliff, architect. Quantities by architect:—

A. Brown	£8,508	0	0
Perks & Son	8,025	0	0
A. B. Clarke	7,850	0	0
G. Wagg	7,839	17	6
Youngman & Son	7,817	0	8
Warner Bros.,* Mickleover, near Derby	7,704	4	0

* Accepted.

EAST STONEHOUSE (DEVON).—For proposed lodge and lavatories at Victoria Park, for the county boroughs of Plymouth and Devonport and the township of East Stonehouse. Mr. A. W. Debnam, architect and surveyor:—

Wakeham Bros., Plymouth	£1,624	0	0
Turpin, Plymouth	1,613	0	0
Goad, Plymouth	1,592	0	0
May, Plymouth	1,530	0	0
Stevenson, Plymouth	1,520	0	0
Blake, Plymouth	1,502	0	0
Blackall & Son, Plymouth	1,431	0	0
Skinner, Plymouth	1,403	16	9
Truscott, Stonehouse	1,396	0	0
A. M. Coles,* Valletort-yard, Stonehouse, Plymouth	1,386	0	0
Northcott,† Devonport	1,249	0	11

* Accepted. † Withdrawn.

ERITH (KENT).—For private street works in Grosvenor Road, Nelson Road, Raglan Road, and Havelock Road, Belvedere, for the Erith Urban District Council:—

Wilson, Border & Co., Ilford	£2,716	1	5
T. Adams, Wood Green, N.	2,498	3	0
Fry Bros., Greenwich	2,453	14	2
Free & Sons, Maidenhead	2,166	0	0
Woodham & Sons, Catford, S.E.	2,164	4	0
A. C. Soan, 2, Cunliffe Street, Streatham	2,159	13	6
W. H. Wheeler, 235, Blackfriars Road, S.E.	2,050	8	6
Lawrence & Thacker, Clapham Common, S.W.	2,009	8	8
R. Ballard,* Child's Hill, N.W.	1,987	0	0

[Surveyor's estimate, £2,207 5*s*. 5*d*.]

* Accepted.

GLOUCESTER.—For new shop front and other works at No. 32 Eastgate Street, Gloucester. Mr. Harry A. Daucey, architect, 26 Clarence Street, Gloucester:—

J. Simmonds, Gloucester	£265	10
W. Jones, Gloucester	248	0
Collins & Godfrey, Tewkesbury	247	0
W. Byard, Gloucester	208	7
E. Clutterbuck*, Gloucester	200	0

* Accepted.

HARPENDEN.—For the erection of a pair of villas at West Common, Harpenden, for Mr. C. B. Dobson. Mr. Percival C. Blow, A.R.I.B.A., architect, St. Albans and Harpenden:—

W. Sharp, St. Albans	£1,675
E. Dunhan, St. Albans	1,170
C. Miskin & Sons, St. Albans	1,130
Phillips & Blake*	1,1,0

* Accepted.

ILKESTON.—For the erection of villa, Little Hallam Lane, Ilkeston, for Mr. M. Smith. Messrs. Geo. Haslam, M.S.A., & Son, architects:—

W. V. Ireson	£578	0
D. Roberts	555	9
T. Hallam	553	16
Alfred Earnshaw*	488	0

* Accepted.

ILKESTON. — Accepted for the erection of a house and shop, Heanor Road, Ilkeston, for Mr. William Shakspeare. Messrs. Geo. Haslam, M.S.A., & Son, architects:—

Alfred Earnshaw	£700

KEIGHLEY.—Accepted for stores, Bradford Road, Keighley, for the Keighley Industrial Co-operative Society, Ltd. Messrs. John Haggas & Sons, architects, Keighley:—

Mason, Mr. Thos. Moore.
Slater, Mr. William Thornton.
Plasterer, Mr. Chris. Herd.
Plumbers, Messrs. Crabtree & Wallace.

Exclusive of joiners' and painters' work.
[£971 14s. 4d.]

LONDON, W.—For the erection of shops and flats to be known as Uxbridge Mansions, 156 and 158 Uxbridge Road, W., for Mr. Chas. Tarrant. Mr. Alfred H. Hart, architect, 9, Staple Inn, W.C.:—

Lyford	£4,333
Williams	4,291
Hastings & Ladley	4,160
Sabey & Sons	4,041
Chessum	3,952
Weibking & Sons*	3,519

* Accepted.

LONDON, S.W.—For the enlargement of the Merton Road School, Southfields, for the London School Board. Mr. T. J. Bailey, architect:—

General Builders, Ltd.	£4,363
J. Allen & Sons, Ltd.	4,078
J. Garrett & Son	3,841
H. Wall & Co.	3,832
E. P. Bulled & Co.	3,812
F. & H. F. Higgs	3,805
J. Carmichael	3,782
W. Johnson & Co., Ltd.	3,753
J. & C. Bowyer	3,686
O. Craske	3,643
E. Triggs	3,548
J. & M. Patrick*	3,439

* Recommended for acceptance.

LONDON.—For the erection of a factory at Woodfield Road, Paddington, for Messrs. Priddy & Hale, Ltd. Mr. Percival C. Blow, A.R.I.B.A., architect, St. Albans and Harpenden. Quantities by Mr. H. Riley, Victoria Mansions, S.W.:—

Lawrance & Sons	£8,554
Patman & Fotheringham	8,393
McCormick & Sons	7,900
Colls & Sons	7,642
G. Neal	£7,669
J. Allen & Sons	7,665
G. H. & A. Bywaters & Son*	7,524
Holiday & Greenwood	7,477

* Accepted.

LONDON.—For the erection of new War Office, Whitehall, S.W., for the Commissioners of H.M. Office of Works, &c.:—

Martin, Wells, & Co.	£632,000
W. Pattinson & Sons	591,000
B. E. Nightingale	587,420
Pethick Bros.	583,150
Leslie & Co., Ltd.	582,360
J. Mowlem & Co.	570,000
W. H. Lorden & Son	562,200
C. Wall	559,640
Holloway Bros.	551,345
Higgs & Hill, Ltd.	£545,994
J. Shillitoe & Son	530,000
H. Lovatt	527,000
H. S. Foster	515,000
H. Martin	505,000
Maple & Co., Ltd.	497,875
Perry & Co.	495,325
Foster & Dicksee*	473,231

* Accepted.

LONDON.—For rebuilding premises in Tottenham Court Road. Mr. Alfred Conder, architect, Palace Chambers, Westminster. Quantities by Mr. E. J. Paine, 11 Great James Street, W.C.:—

Steed and Son	£3,997
Grover and Son	3,966
McCormick & Sons	3,828
R. H. & R. Roberts	3,659
E. Toms	3,597
B. E. Nightingale	£3,559
Stimpson & Co.	3,550
Akers & Co.	3,408
H. Young*	3,168

* Accepted.

LONDON, E.C.—For rebuilding Nos. 20 and 21 Harp Lane, Great Tower Street, E.C., for Mr. Thos. Yeo. Mr. Geo. Pearson, architect, 58 Moorgate Street. Quantities by Mr. H. Theobald, 6 South Street, Finsbury:—

Rider & Son	£6,887
G. Munday & Sons	6,665
W. Johnson & Co., Ltd.	5,897
G. S. Williams & Sons	5,850
Colls & Sons	5,826
Perry & Co.	5,749
Ashby & Horner	5,700
Killby & Gayford	5,633
Patman & Fotheringham, Ltd.	5,587
E. Lawrance & Sons	5,554
Mark Patrick & Son,* Westminster Bridge Road	5,470

* Accepted.

LONDON, N.W. — For the erection of factories, Euston Buildings, N.W. Mr. Leonard V. Hunt, A.R.I.B.A., architect, 34 Queen Street, E.C.:—

F. & H. F. Higgs	£13,892
Ward & Lamble	12,338
Ashby & Horner	11,547
F. T. Chinchen	10,987
Kellby & Gayford	10,836
William King & Sons	10,754
Bywaters & Sons	10,750
L. Whitehead & Co.*	10,475

* Accepted.

LONDON, S.E.—For the erection of a school at Kilmorie Road, Stanstaad Road, Forest Hill, for the London School Board. Mr. T. J. Bailey, architect:—

		A.
J. Garrett & Son	£24,786	£411
F. & H. F. Higgs	24,758	402
W. Antill & Co.	24,545	420
Kirk & Randall	24,172	407
Perry & Co.	23,689	325
Treasure & Son	22,931	305
Holliday & Greenwood, Ltd.	22,750	387
J. & M. Patrick*	21,787	309

A.—Add if walls of class-rooms and halls are plastered.

* Recommended for acceptance.

LONDON, S.E.—For the erection of a school at Church Manor Way, Plumstead, for the London School Board. Mr. T. J. Bailey, architect:—

		A.
F. & F. H. Higgs	£24,227	£299
Perry & Co.	23,842	287
Holliday & Greenwood, Ltd.	23,630	261
E. Lawrance & Sons	23,539	270
J. Garrett & Son	23,293	-
Treasure & Son	23,169	274
Kirk & Randall	22,847	240
J. Smith & Sons, Ltd.	22,545	279
J. Chessum & Sons*	22,281	83

A.—Add if walls of class-rooms and halls are plastered.

* Recommended for acceptance.

LONDON, S.W. — For alterations and additions to the late St. Martin's Town Hall, transforming it into the new Town Hall, for the Council of the City of Westminster. Mr. John Murray, F.R.I.B.A., architect:—

		A.	B.	Total.
Perry & Co.	£27,988	£504	£793	£29,285
Kirk & Randall	26,940	560	800	28,300
Holland & Hannen	26,670	720	780	28,170
Higgs & Hill, Ltd.	26,500	584	760	27,844
Campbell, Smith, & Co., Ltd.	26,272	690	850	27,812
Wm. Johnson & Co., Ltd.	26,340	630	750	27,720
Holliday & Greenwood, Ltd.	25,930	580	760	27,270
B. E. Nightingale	25,272	630	775	26,677
Holloway Brothers	25,300	600	770	26,670
Prestige & Co.	24,877	525	780	26,172
Maple & Co., Ltd.	24,560	360	760	25,680
Henry Lovatt	24,500	400	738	25,638
G. H. & A. Bywaters & Sons	23,380	850	910	25,140
Patman & Fotheringham, Ltd.	22,873	830	890	24,593*

A.—Extra for oak panelling, &c., to the Council Chamber.
B.—Extra for marble to the principal staircase.

* Accepted.

MADRON (CORNWALL).—For the construction of sewerage and water-supply works for the village of Heamoor, and water-supply works for the village of Tolcarne, for the Madron Urban District Council. Mr. Frank Latham, C.E., Penzance, engineer:—

Heamoor sewerage scheme.

C. Lang, Liskeard	£3,218
W. C. Shaddock, Plymouth	2,927
G. Miners,* Marazion	2,786
C. Brealy, Exeter	2,181

Heamoor water supply.

W. H. Thomas & Sons, Camborne	2,455
C. Lang	2,397
W. C. Shaddock	2,388
G. Miners	1,884
G. H. Davies,* Heamoor	1,870
C. Brealy	1,216

Tolcarne water supply.

C. Lang	1,943
W. C. Shaddock	1,927
W. H. Thomas & Sons	1,852
S. Rodda, Redruth*	1,495
G. Miners	1,488
C. Brealy	1,380

* Accepted.

MAYFIELD (SUSSEX).—Accepted for alterations and additions to the "Gables," Mayfield, Sussex, for Dr. Crochley, Clapham. Mr. Charles H. Mead, architect, 8 Mortimer Street, London, W.:—

J. Moon, Mayfield, Sussex	£275

MERTON.—For additions to Rutlish Science School, Merton. Surrey. Mr. H. G. Quartermain, M.S.A., architect, Kingston Road, Merton, Quantities by Messrs. J. Leaning & Sons:—

Bulled & Co.	£2,382
Holliday & Greenwood	4,277
Killby & Gayford	4,256
F. Gough & Co.	4,254
Wall & Co.	4,200
Garrett & Sons	£4,178
Lorden & Sons	3,944
J. Smith & Sons	3,939
Parsons & Townsend	3,750
J. Burges & Sons	3,625

NEWHAVEN (SUSSEX).—For piling foundations for warehouse at Newhaven, Sussex. Mr. F. J. Rayner, C.E., engineer, Newhaven:—

A. Thorn, Westminster	£2,110
Brooke & Co.	2,060
W. Hill & Co.	£1,975
Pedrette & Co., Finsbury Park	1,950
A. Fowler, Chawick	1,790
G. Hayward, Grays	1,838
A. Fosey & Sons, Leytonstone	1,781
A. E. Nunn, Tenterden	1,650
W. Thair & Co., Manor Park	1,565
Leggott & Speight, Hull	1,485
T. W. Pedrette, Rochester	1,390
H. Chambers,* Seaford	1,360

* Accepted.

NEWPORT (ISLE OF WIGHT).—For the supply of mains for Northwood and Newport:—

Northwood only.

Bentley Iron Co., Durham	£1,617	1	0
Cochrane & Co., Dudley	1,312	4	9
Laidlaw & Son, Ltd., Glasgow	1,284	12	8
Stanton Ironworks Co., Nottingham	1,254	3	4
McLester, Middlesbrough	1,231	11	0
Macfarlane, Strang, & Co., Ltd., Glasgow	1,193	6	0
A. Cloake, Holborn	1,051	6	2

Whole district.

Bentley Iron Co.	3,010	1	0
Cochrane & Co.	2,441	13	6
Laidlow & Son, Ltd.	2,368	14	9
Stanton Ironworks Co.	2,336	13	4
McLester	2,277	3	6
Macfarlane, Lang, & Co.,* Ltd.	2,204	14	0
A. Cloake	1,929	0	11

* Accepted.

For supply of valves: Clay, Henriques, & Co., Dewsbury, £71 17s. 6d.

NORWICH. — For the extension of the City Asylum. Mr. Arthur E. Collins, M.Inst.C.E., city engineer:—

Coulson & Loft, Cambridge	£6,257	1	4
Downing & Son, Norwich	6,238	0	0
G. E. Hawes, Norwich	5,958	0	0
J. Youngs & Son, Norwich	5,957	0	0
J. S. Smith, Norwich	5,813	10	0
John Hurn, Norwich	5,792	0	0
Chapman & Son, Norwich	5,342	0	0
H. C. Greengrass,* Norwich	5,206	16	8

[City engineer's estimate, £5,525 17s. 1d.]

* Accepted.

NORWICH.—For the erection of new stabling, stores, &c. at New Mills. Mr. Arthur E. Collins, M.Inst.C.E., city engineer:—

Martin, Wells & Co., Aldershot	£6,700	0
Coulson & Loft, Cambridge	6,364	0
G. E. Hawes, Norwich	6,025	0
J. S. Smith, Norwich	5,947	0
T. H. Blyth, Foulsham	5,930	0
J. Downing & Son, Norwich	5,882	0
J. Youngs & Son, Norwich	5,710	0
J. Hurn, Norwich	5,662	10
H. C. Greengrass, Norwich	5,460	0
Chapman & Son,* Norwich	5,249	0

[City engineer's estimate, £5,643 4s. 10½d.]

* Accepted.

PORTSMOUTH.—For the construction of car-shed, pits, drains, and arcade at Gladys Avenue, North End, in the borough of Portsmouth, for the Corporation. Mr. E. Rotter, A.M.I.C.E., tramways engineer:—

W. W. Learmouth, Emsworth Road, North End	£10,598	0
Light & Son, 445 Commercial Road, Portsmouth	19,143	0
H. Clark & Son, Claxton Street, Portsmouth	18,590	0
W. Ward, Coburg Street, Fratton	18,587	0
J. W. Perkins, Clive Road, Fratton	18,350	0
J. Crockerell, Victoria Road North, Southsea	18,218	0
W. W. Evans,* Brougham Road, Southsea	17,980	0
J. & M. Patrick, Wandsworth, London	17,780	9

* Accepted.

ROWLANDS GILL (near NEWCASTLE).—For the erection of a Wesleyan Methodist church school at Rowlands Gill. Mr. F. R. N. Haswell, F.R.I.B.A., architect, 77 Tyne Street, North Shields:—

R. Smith, Winlaton	£2,620	0	0
Davison & Bolam, Blaydon	2,517	2	8
A. Armstrong, Blaydon	2,517	0	0
T. A. Turnbull, Annfield Plain	2,416	2	7
Turner Bros., Gateshead	2,121	15	9

ST. ALBANS.—For the erection of a residence at Clarence Road, St. Albans. Mr. Percival C. Blow, A.R.I.B.A., architect, St. Albans and Harpenden.

J. Hunt, Hoddesden	£1,744
Thomas Turner, Ltd., Watford	1,698
C. Miskin & Sons, St. Albans	1,580
Phillips & Blake, Harpenden	1,474
E. Dunham,* St. Albans	1,386

* Accepted.

STOKE-UPON-TRENT.—For the erection of three shops and warehouse in High Street, Stoke-upon-Trent, for Mr. J. H. Irwin Messrs. R. Scrivener & Sons, architects, Hanley:—

Brain & Smith, Longton	£3,597	0	0
R. E. James, Stoke	3,447	12	2
Tompkinson & Bettallay, London	3,305	0	0
J. Bagnall, Fenton	3,210	0	0
Meiklejohn & Son,* Stoke-on-Trent	3,100	0	0

* Accepted.

WOOLWICH.—For drainage and roadmaking in connection with six cottage homes upon site abutting upon Lodge Lane, Bostal Heath, Plumstead, for the Guardians of Woolwich Union. Messrs. Church, Quick, & Whincop, architects, William Street Woolwich:—

Foster Bros.	£5,058	0	0
W. H. Wheeler	4,400	4	11
Thomas & Edge	3,700	0	0
T. Adams	3,672	6	0
Fry Bros.	3,517	14	0
A. T. Catley	3,200	0	0

WREXHAM.—For the erection of county school buildings at Wrexham. Mr. J. H. Phillips, architect, Clive Chambers, Windsor Place, Cardiff.

J. E. Evans, Cardiff	£12,575	0	0
Davies Bros.	9,981	14	0
J. Hughes	9,900	0	0
J. Gethin & Co., Shrewsbury	9,725	0	0
Lewis Bros.	9,585	0	0
E. H. Nicholas, Shrewsbury	9,470	17	3
W. E. Samuel*	9,425	0	0

[Rest of Wrexham.]

* Accepted.

WROTHAM (KENT).—For the erection of 12 cottages in Kensington Road for the housing of the working classes, for the Urban District Council:—

B. J. White, Chislehurst	£3,450
Tapner & Co., Hastings	3,165
G. Gates, Rochester	3,040
J. Manley, Fairseat, Wrotham	2,970
Batchelor, Maidstone	2,938
E. Jones, Nunhead	2,900
Simmons, Stanstead	2,850
S. Iggleden,* Wrotham	2,838
F. Down, Hildenborough	2,725

* Accepted.

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CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	8	6		—	
Clover, best	per load	4	5	0	5	10	0
Hay, best	do.	4	15	0	5	5	0
Sainfoin mixture ..	do.	4	5	0	5	2	6
Straw	do.	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ..	per cwt.	1	8	0	1	8	7
Colza Oil, English ..	do.	1	8	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	4	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	4½		—	
Linseed Oil, barrels ..	do.	1	12	0	1	12	3
Petroleum, American ..	per gal.	0	0	5⅝	0	0	5¾
Do. Russian ..	do.	0	0	4⅞		—	
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	3	1	6		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt ..	per cwt.	1	5	3	1	5	6
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	1	6	3	1	6	6

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ..	per ton	83	0	0		—	
Iron, Staffs., bar ..	do.	6	7	6	8	10	0
Do. Galvanised Corrugated sheet ..	do.	11	5	0	11	10	0
Lead, pig, Spanish ..	do.	12	1	3		—	
Do. do. English common brands	do.	12	7	6	12	10	0
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	5	0
Do. floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	per ton	5	15	0	6	15	0
Do. Mild Bars	do.	6	15	0	7	1	0
Tin, Foreign	do.	130	0	0	130	1	00
Do. English ingots ..	do.	130	0	0		—	
Zinc, sheets, Silesian ..	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	16	12	6	17	0	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel ..	per load	3	0	0	4	0	0
Pine, Quebec Yellow ..	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic ..	per fath.	4	10	0	5	10	0
Do. Petersburg ..	per bundle	0	0	9	0	0	10½
Deals, Archangel 2nd & 1st	per P.Std.	8	5	0	11	15	0
Do. do. 4th & 3rd	do.	8	0	0		—	
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	21	0	0		—	
Do. do. 2nd „	do.	19	0	0		—	
Do. do. unsorted	do.	11	0	0		—	
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	9	10	0	18	0	0
Do. White Sea ..	do.	9	15	0	13	0	0
Do. Quebec Pine, 1st ..	do.	22	0	0	23	0	0
Do. do. 2nd ..	do.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0		—	
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick ..	do.	7	5	0	8	0	0
Battens, all kinds ..	do.	6	0	0	9	0	0
Flooring Boards, 1in. prepared, 1st ..	per square	0	11	6	0	13	6
Do. 2nd ..	do.	0	9	6		—	
Do. 3rd &c. ..	do.	0	6	9	0	7	3

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba ..	per ft. sup.	0	0	$4\frac{5}{32}$		—	
Do. Honduras ..	do.	0	0	$3\frac{21}{32}$		—	
Do. Tobasco	do.	0	0	4		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ..	per ft. sup.	0	0	4⅝		—	
Do. African ..	do.	0	0	$2\frac{29}{32}$		—	

COMING EVENTS.

Saturday, August 3.
NORTH OF ENGLAND MINING AND MECHANICAL ENGINEERS, Newcastle-on-Tyne.—Council meeting at 1.30 p.m. Annual General Meeting at 2 p.m.

Saturday, August 10.
ARCHITECTURAL ASSOCIATION.—Fourth Summer Visit.

Saturday, August 10, to Saturday, August 17.
INSTITUTION OF JUNIOR ENGINEERS.—Summer Excursion to Plymouth and Devonport.

Saturday, August 24.
ARCHITECTURAL ASSOCIATION.—Fifth Summer Visit.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to South Shields.

Saturday, August 31.
NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.

Tuesday, September 3 to Friday, September 6.
IRON AND STEEL INSTITUTE.—Autumn Meeting at Glasgow.

New Companies.

Houses, Ltd.

Registered July 5th to acquire and deal in and with house property, buildings, land, &c., and to carry on the business of builders, financiers, contractors and agents. Capital £2,000 in £1 shares. The first directors are A. Manners, F. Martin and E. I. Richardson.

Du Bois Co., Ltd.

Registered July 12th to acquire the business of the British and Foreign Du Bois Co., Ltd., and the United Enterprises, Ltd., and to carry on the business of plumbers, lead workers, manufacturers of lead and other traps, gasfitters, water and hydraulic engineers, plumbers' merchants, mechanical engineers, fitters, japanners, electro-platers, enamellers, &c. Capital £200,000 in £1 shares. The first directors are E. S. Torrey, A. Rosenthal and J. B. Purchase.

Mullens & Co., Ltd.

Registered July 12th to acquire any land, houses, buildings and other property, and to carry on the business of landowners, builders, financiers, estate owners and managers, trustees, &c. Capital £2,000 in £1 shares.

Wakeford & Co., Ltd.

Registered July 12th to take over the business of a timber, slate, cement, wood and building material importer, merchant and dealer carried on by J. Wakeford at High Street, Sutton, Surrey, and to carry on the same. Capital £5,000 in £1 shares. The first directors are J. Wakeford, H. W. Tucker (manager) and I. Mitchell.

Kitson Lighting Co. of Great Britain, Ltd.

Registered July 13th to acquire from the Kitson Lighting and Heating Syndicate, Ltd., the benefit of certain patents relating to lighting and heating, and to carry on the business of suppliers of light and heat, manufacturers of lamps, stoves and lighting and heating apparatus. Capital £250,000 in £1 shares. The first directors are Sir R. H. Knox, Hugh C. Smith, William Oulton, Frederick H. Richardson, James Todd, Richard B. Summerson and Arthur Kitson.

Aaron Madin & Co., Ltd.

Registered July 16th to acquire the business carried on at Wheeldon Mill, Brimington, Derby, and at Pottery Lane, Whittington Moor, Whittington, Derby, as Aaron Madin & Co., and to carry on the business of earthenware manufacturers, potters, china manufacturers, brick, tile and terra-cotta makers, miners, &c. Capital £6,000 in £10 shares. The first directors are J. Knowles, F. Farnsworth, E. Glassbrook, J. Alton and W. Smalley.

Association General, Ltd.

Registered July 16th to carry on the business of contractors for public works and conveniences, patent owners, engineers, builders, &c. Capital £5,000 in £1 shares.

London Lime, Cement, Brick and Slate Merchants Trade Protection Association, Ltd.

Registered July 17th. Capital £5 in 1s. shares.

British Mineral Products Syndicate, Ltd.

Registered July 19th to acquire the business of a plaster-of-Paris and cement merchant, and also the agency business now carried on by J. A. Thomlinson at 59, Warwick Street, W., and to carry on the same and the business of general builders' merchants. Capital £2,000 in £1 shares. The first directors are J. A. Tomlinson and G. S. Bigland. Registered office: 59, Warwick Street, W.

Polytechnic Estate, Ltd.

Registered July 19th to carry on the business of land and property owners, builders, financiers, contractors, decorators, timber, hardware and building material dealers, house and estate agents, auctioneers, &c. Capital £20,000 in £10 shares. Registered office: Kingston Road, Wimbledon, Surrey.

Sommerfield & Mead, Ltd.

Registered July 19th to adopt an agreement with L. B. Sommerfield and H. G. Mead for the acquisition of the business carried on at Humber Chambers, Kingston-on-Hull, and to carry on the business of stone, cement, lime, coke, fuel and cement merchants, exporters and factors, colliery and quarry owners, dealers in bricks, timber, hardware and other building requisites, engineers, &c. Capital £10,000 in £1 shares (4,000 preference). The first directors are L. B. Sommerfield and H. G. Mead.

Land and Buildings Estates Co., Ltd.

Registered July 20th to acquire the Cintra Park Estate, Upper Norwood, S.E., to acquire other lands and buildings, and to carry on the business of land and property owners, builders, financiers, farmers, contractors, brick, stone, timber, hardware and building material merchants, &c. Capital £20,000 in £1 shares.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Aug. 2	Edenderry—Cottages	District Council	Mr. Waters, C.E., Edenderry.
" 2	Gravesend—Chimney Shaft, &c.	Town Council	W. H. Trentham, 39 Victoria Street, Westminster, S.W.
" 2	Sunderland—Sheds	Corporation	Barnes & Coates, 41 Fawcett Street, Sunderland.
" 3	Birkenhead—Offices	Guardians	E. Kirby, 5 Cook Street, Liverpool.
" 3	King's Lynn—Alterations	W. & T. Bagge	H. Tilson, Architect, Railway Road, King's Lynn.
" 3	Ashton-in-Makerfield—Retort House	Urban District Council	Clerk's Office, Council Offices, Ashton-in-Makerfield.
" 3	Cardiff—Shop, &c.	Messrs. Heitzman & Sons	Veall & Sant, 6 Arcade Chambers, High Street, Cardiff.
" 3	Merthyr Tydfil—Premises	Miss Mary Davies	E. M. B. Vaugham, Architect, Cardiff.
" 3	Abercwmbri—Thirty-one Houses	Building Club	T. W. Millar, Architect and Surveyor, Mountain Ash.
" 4	Loughor—Chapel	—	T. Arnold, Castle Buildings, Llanelly.
" 5	Llandovery—School and House Wings	Governors of College	Wright & Son, Surveyors, Lancaster.
" 5	Newport, I.W.—Library, Technical Institute, &c.	County Council	F. Newman, County Surveyor, St. Thomas Street, Ryde.
" 6	Ackworth, Durham—Clerestory	—	Rectory, Parish Church, Ackworth, near Pontefract.
" 6	Teignmouth—Alterations	Urban District Council	C. Jones, Surveyor to the Council, Town Hall, Teignmouth.
" 6	Torquay—Extensions	Corporation	F. S. Hex, Town Clerk, Town Hall, Torquay.
" 6	London, N.W.—Additions to the Public Library	Willesden District Council	O. C. Robson, Public Offices, Dyne Road, Kilburn, N.W.
" 6	Merthyr, Wales—Houses	Urban District Council	J. Vaughan, Clerk, Town Hall, Merthyr.
" 6	Torquay—Extensions	Corporation	F. S. Hex, Town Clerk, Town Hall, Torquay.
" 7	Ely, near Cardiff—Schools	Llandaff School Board	Edgar Down, 31 High Street, Cardiff.
" 7	West Hartlepool—Stabling	North Eastern Railway	Stationmaster, West Hartlepool.
" 8	Ynyshire—Premises	Baden-Powell Conservative Club	O. Evans, Architect, Pontypridd.
" 8	King's Lynn—Infirmary	Guardians of Union	R. O. Coulton, Clerk to the Guardians, King Street, King's Lynn.
" 9	Worcester—Police Station Buildings	Standing Joint Committee	H. Rowe, County Surveyor, Worcester.
" 9	Saltburn—Completion of House	—	E. Whipham, 59 High Street, Stockton-on-Tees.
" 10	Musselburgh—Municipal Buildings	Town Council	Lyle & Constable, 3 Hill Street, Edinburgh.
" 12	Abergavenny—Bridge	Rural District Council	J. Gill, 4 Brecon Road, Abergavenny.
" 12	Hoylake—Stables, &c.	Urban District Council	T. Foster, Engineer, District Council Offices, Hoylake.
" 12	Benwell—School	School Board	W. Thompson, 63 Grey Street, Newcastle-on-Tyne.
" 14	London, S.W.—Superstructure	Commissioners of H. M. Works	A. Webb, 19 Queen Anne's Gate, S.W.
" 15	Fulham—Additions to Workhouse	Guardians	A. P. Snell, 22 Southampton Buildings, Chancery Lane, W.C.
" 16	Low Fields, Ingleton—Residence Stables, &c.	Mr. William Taylor	S. Shaw, Architect, Highgate, Kendal.
" 19	Pembroke Dock—School	School Board	G. Morgan & Son, 24 King Street, Carmarthen.
" 24	Nelson—Central Station	Electricity and Tramways Committee	B. Ball, Borough Engineer and Surveyor, Nelson.
" 24	Walsall—Town Hall	Corporation	R. H. Middleton, Borough Engineer, Walsall.
Sept. 16	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
	ENGINEERING:		
Aug. 2	Edenderry—Pump Stick	District Council	T. H. F. Bor, Clerk to the Union, Board Room, Edenderry.
" 2	Liverpool—Permanent Way	South Lancs. Electric Traction and Power Company, Limited.	Kincaid, Waller & Manville, 29 Gt. George Street, Westminster.
" 2	Midsomer Norton—Waterworks	—	W. F. Bird, Surveyor, Market Hall, Midsomer Norton.
" 3	Madrid—Harbour Works	—	Public Works Department, Madrid.
" 5	Dundee—Condensing Plant	Gas Commissioners	W. H. Tittensor, Dudhope Crescent Road, Dundee.
" 5	Campbelltown—Water Supply Works	—	G. Gordon & Co., C.E., Inverness.
" 5	Brecon—Electric Lighting	Asylum Committee	Giles, Gough & Trollope, 28 Craven Street, Strand, W.C.
" 6	Cardiff—Switchboard	Corporation	A. Ellis, Old Post Office, Buildings, Cardiff.
" 6	Patrick—Wiring	Provost, Magistrates and Councillors	J. Donaldson, 97 West Regent Street, Glasgow.
" 6	Grays Thurrock—Electric Lighting	School Board	Board Room, Quarry Hill, Grays.
" 7	Blairgowrie—Water Supply	—	Anderson, Chapman & Co., solicitors, Blairgowie.
" 7	Manchester—Feeder and Section Pillars	Electricity Committee	F. E. Hughes, Electricity Department, Town Hall, Manchester.
" 8	Uxbridge—Cooking Apparatus	Guardians	C. Woodbridge, Union Offices, 38 High Street, Uxbridge.
" 8	Leon, Spain—Water Supply	Corporation	Office of the Municipal Works, Leon.
" 9	Clones—Sewage Disposal Works	Urban District Council	J. H. H. Swiney, Avenue Chambers, Beliast.
" 9	Moss Side—Disinfecting Apparatus	Urban District Council	H. B. Longley, Council Offices, Moss Side, Manchester.
" 9	Bristol—Grain Elevator	Docks Committee	W. W. Squire, Engineer's Offie, Cumberland Basin, Bristol.
" 10	Knaresborough—Pump	Urban District Council	S. Turner, Surveyor to the Council, Knaresborough.
" 10	Woolacombe—Reservoir	—	T. Rees, Corn Exchange Chambers, Newport, Mon.
" 10	Hunslet—Settling Tanks, &c.	Rural District Council	C. H. Marriott, Son & Shaw, Dewsbury.
" 10	Shipston-on-Stour—Water Supply	Rural District Council	N. Lailey, 16 Great George Street, Westminster.
" 12	Tyldesley—Steel Tank	Urban District Council	Engineer, Gasworks, Tyldesley.
" 12	Stanford-le-Hope, Essex—Pumping machinery	Orsett Rural District Council	R. F. Grantham, 23 Northumberland Avenue, W.C.
" 12	Stanford-le-Hope, Essex—Sewage Disposal Works	Orsett Rural District Council	R. F. Grantham, 23 Northumberland Avenue, London, W.C.
" 13	Fenny Stratford—Sewage Disposal Works	Urban District Council	J. Chadwick. Engineer, Bletchley, Bucks.
" 13	Aberdeen—Sewers, &c.	Town Council	W. Dyack, Burgh Surveyor, Town House, Aberdeen.
" 15	Ipswich—Reservoir	Waterworks Committee	H. Roberts, Engineer and Surveyor of Waterworks, Ipswich.
" 16	Jassy—Supply of Water to Town	Communal Council	Communal Technical Department, Jassy.

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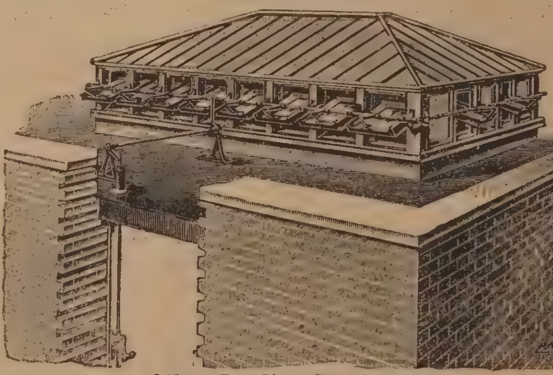

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DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ENGINEERING—*continued.*		
Sept.	2	Amsterdam—Electrical Tram Carriages and Rails	Municipality	Director of the Municipal Tramways, Nieuwe Achtergracht No. 164, Amsterdam.
Oct.	1	Copenhagen—Bridge	——	Statsbaneaulaegenes Köntor, Reventlowsgade, 10 Copenhagen, B.
„	1	Hadsward, Denmark—Bridge	Danish Ministry for Public Works	Statsbaneaulaegenes, Köntor, Reventlowsgade, 10 Copenhagen, B.
Dec.	10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.
Dec.	31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
Feb.	28	Sydney, N.S.W.—Bridge	Government of N.S.W.	Under Secretary for Public Works, Sydney.
		IRON AND STEEL:		
Aug.	7	London, E.C.—Steel Fishbolts and Nuts	East Indian Railway Co.	G. W. Young, Secretary, Nicholas Lane, London, E.C.
„	12	Buxton—Mains	Urban District Coucil	W. H. Grieves, Town Surveyor, Town Hall, Buxton.
„	12	London, N.—Lamp Columns	Urban District Council	E. J. Lovegrove, Engineer to the Council, Hornsey.
„	12	Stanford-le-Hope, Essex—Pipes	Rural District Council	R. F. Grantham, 23 Northumberland Avenue, London, W.C.
		PAINTING AND PLUMBING:		
Aug.	5	Cleckheaton—Interior Renovation of Church	——	Wesleyan Church, Whitcliffe Road, Cleckheaton.
„	5	Chelmsford—Painting, &c.	Guardians of Poor of the Union	Master, Union House, Wood Street, Chelmsford.
„	7	London, E.C.—Paints, &c.	East Indian Railway Company	C. W. Young, Secretary, Nicholas Lane, London, E.C.
„	9	Salford—Painting, &c., Union Offices	Guardians of the Union	F. Townson, Union Offices, Eccles New Road, Salford.
„	15	Newhaven—Painting, &c.	Guardians of the Union	Master, Workhouse, Newhaven.
		ROADS AND CARTAGE:		
Aug.	2	Bishop's Stortford—Granite	Urban District Council	T. Swatheridge, Council's Offices, North Street, Bishop's Stortford.
„	2	Sandgate—Materials	Urban District Council	L. J. D. Brockman, 48 Sandgate Road, Folkestone.
„	2	Branksome—Making up, &c.	Urban District Council	S. J. Newman, Surveyor to the Council, Council Bldgs., Branksome.
„	3	Brandon—Asphalting	Urban District Council	R. Gardner, Surveyor, Langley Moor, near Durham.
„	3	Bexhill—Paving, &c.	Urban District Council	G. Ball, Surveyor, Town Hall, Bexhill.
„	3	Currickfergus—Stones	Urban Council	Council's Offices, Town Hall, Carrickfergus.
„	3	Epsom—Road Stone	Urban District Council	Surveyor's Office, Epsom.
„	3	Windsor—Paving, &c.	Town Council	E. A. Stickland, Borough Surveyor, Alma Road, Windsor.
„	5	Cleethorpes—Paving, &c.	Urban District Council	E. Rushton, District Council, Poplar Road, Cleethorpes.
„	5	Jarrow—Paving, &c.	Urban Sanitary Authority	J. Petre, Borough Surveyor, Jarrow.
„	5	Motherwell—Lowering Road	Directors of the Caledonian Railway Co.	Company's Engineer, Buchanan Street Station, Glasgow.
„	6	Southampton—Tar Macadam	Corporation	W. B. G. Bennett, Borough Engineer, Southampton.
„	6	Warrington—Forming, &c.	Paving and Sewerage Committee	T. Longdon, Borough Engineer & Surveyor, Town Hall, Warrington.

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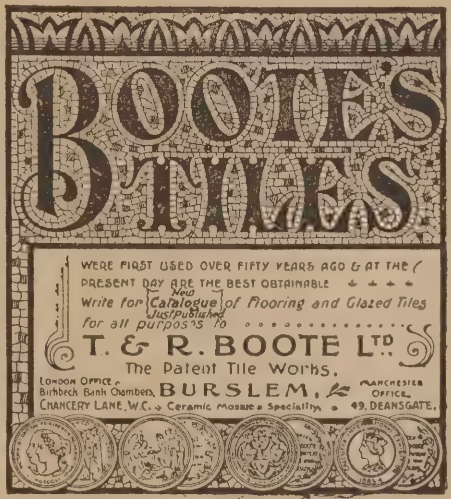

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DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	ROADS AND CARTAGE—*continued.*		
Aug. 7	Clacton-on-Sea—Flints	Urban District Council	A. R. Robinson, Surveyor to the Council, Town Hall Buildings, Clacton-on-Sea.
7	Tamworth—Granite	Rural District Council	Surveyor's Office, Tamworth.
" 8	Ostend—Paving	——	15 Rue des Augustins, 15, Brussels.
" 8	Uxbridge—Flushing Van	Rural District Council	J. F. Stow, Engineer and Surveyor to the Council, Corn Exchange, Uxbridge.
" 10	Standish—Street Works	Urban District Council	Heaton, Ralph & Heaton, Architects & Surveyors, King St., Wigan.
" 15	Eastbourne—Road	Town Council	Borough Engineer's Office, Town Hall, Eastbourne.
	SANITARY		
Aug. 6	Walsall—Sewering	Corporation	Borough Surveyor's Office, Bridge Street, Walsall.
" 8	Pudsey—Sewers	Corporation	J. Jones, Borough Surveyor, Church Lane, Pudsey.
" 8	Upton-upon-Severn—Sewers, &c.	Rural District Council	E. B. Marten, Church Street Chambers, Stourbridge.
" 12	Darfield, Barnsley—Sewerage Works	Urban District Council	Council's Surveyor's Office, The Poplars, Darfield.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Aug. 31	Sheffield—Alteration of Ecclesall Church	——	Rev. T. Houghton, Ecclesall Vicarage, Sheffield.
Oct. 1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
" 29	London, S.E.—Baths and Wash-houses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
No date	Walton-on-Thames—Municipal Buildings, Fire Station and Surveyor's Residence.	30, 20 and 10 guineas respectively.	P. H. Webb, Clerk to the Council, Walton-on-Thames.

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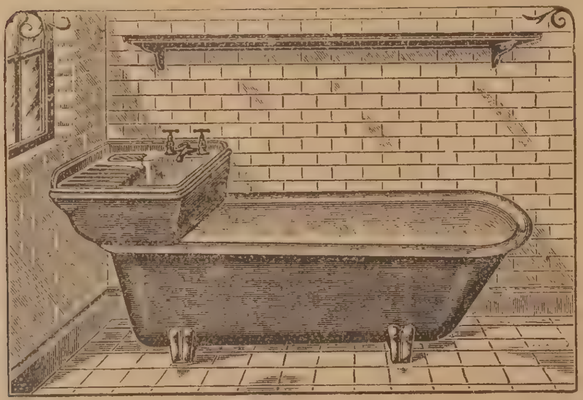

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1855, 18 & 19 Vict. cap. 122	1	7
1894 (London), 57 & 58 Vict. cap. 213...	7	3
1898 (London), 61 & 62 Vict. cap. 137...	–	3½
DRAINAGE ACT:		
1847, 10 & 11 Vict. cap. 38	–	5
ELECTRIC LIGHTING ACTS:		
1882, 45 & 46 Vict. cap. 56	–	9½
1888, 51 & 52 Vict. cap. 12	–	1
EMPLOYERS AND WORKMEN ACT:		
1875, 38 & 39 Vict. cap. 90	–	5
EMPLOYERS' LIABILITY ACT:		
1880, 43 & 44 Vict. cap. 42	–	3½
FACTORIES AND WORKSHOPS ACTS:		
1878, 41 & 42 Vict. cap. 16	2	6
1883, 46 & 47 Vict. cap. 53	–	5
1891, 54 & 55 Vict. cap. 75	–	3
1895, 58 & 59 Vict. cap. 37	–	4½
PUBLIC HEALTH (Buildings in Streets) ACT:		
1888, 51 & 52 Vict. cap. 52	–	1
WORKMEN'S COMPENSATION ACTS:		
1897, 60 & 61 Vict. cap. 37	–	2½
1900, 63 & 64 Vict. cap. 22	–	1

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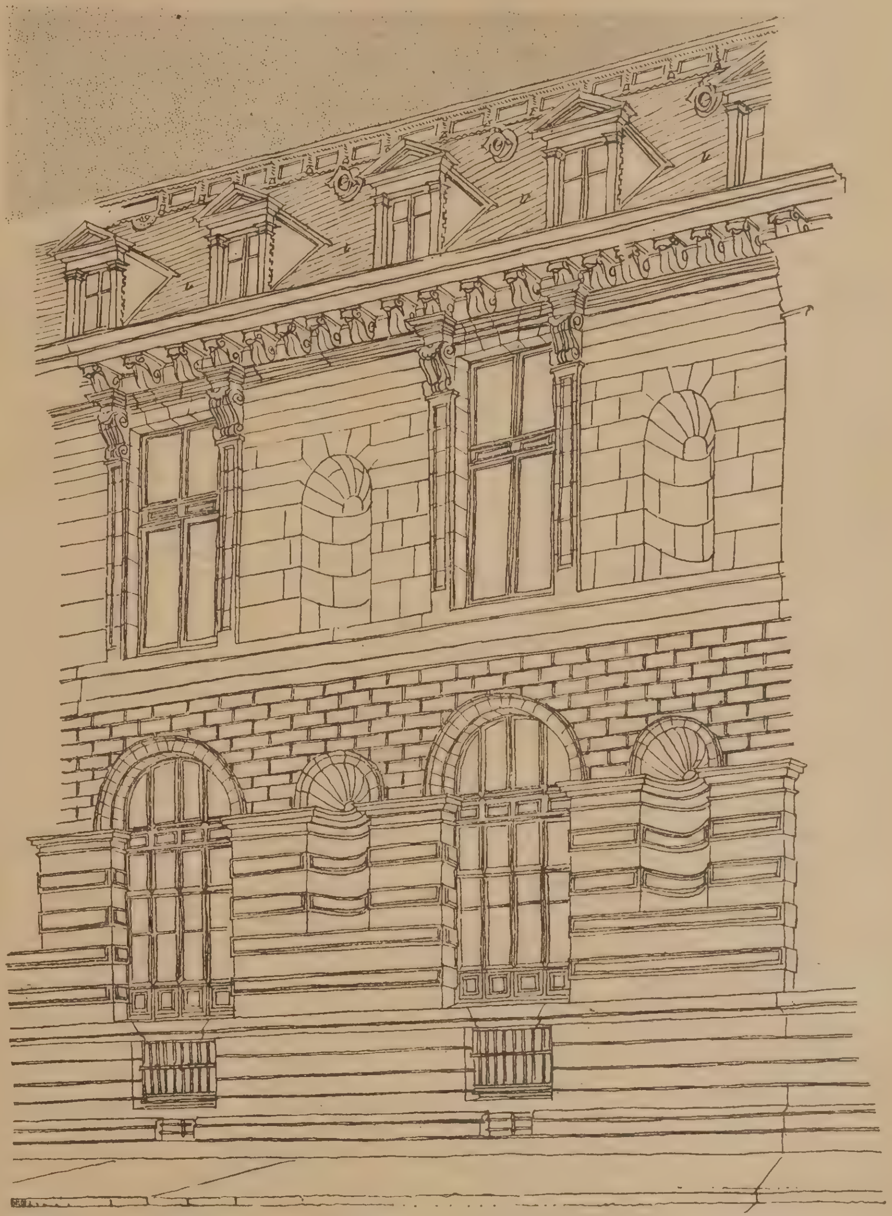
An Architectural Causerie.

The Danger to St. Paul's Cathedral. The rumours current respecting the condition of St. Paul's Cathedral have a great deal more cause for alarm than that which circulated about Westminster Abbey a short time ago, when the fall of a small window shaft of Purbeck marble was sufficient to raise a vision of impending destruction in certain quarters. Mr. Somers Clarke, the architect to the Dean and Chapter, says that St. Paul's is cracked from top to bottom. When, after the Great Fire of 1666, Sir Christopher rebuilt the cathedral, he knew that there was a bed of hard clay about 40ft. below the surface, but was unable to carry his foundations down so far. He therefore put them where the old foundations had been, in a layer of "pot earth," over a bed of sand and shingle above the clay stratum already mentioned. This layer would have been sufficient to withstand for centuries to come the great weight of the superstructure had it not been for the advent of immense drains, and, latterly, of underground railways. But as the result of these excavations and tunnellings the ground has consolidated, resulting in the dislocation of the arches of the nave, choir and transept, and, more important, the subsidence of the west front with its heavy towers and bells. Moreover, the whole of the southern transept has moved, so to speak, towards the Thames. It is true that the movement has only been very slight, but it is sufficient to cause much anxiety to those who have charge of the cathedral. The outer wall of the southern transept, which is between 8ft. and 10ft. thick, and has an outer face of Portland stone with a lining of Oxfordshire stone, is distinctly out of the perpendicular, and in consequence of the strain it has opened from east to west. The north side of the cathedral is, however, perfectly solid. The fabric was first strengthened some hundred years ago by great iron ties put into the cathedral half-way up the walls. The transepts had iron ties securing them to the dome pillars, and they were further strengthened by iron ties placed across their fronts from east to west. The dome was also strengthened by two great iron chains, one placed round its base on the outside and the other a little way up. It is this strengthening up with iron ties which is now being tried in connection with the transept walls. Though the cracks in St. Paul's are disquieting, there is no immediate cause for alarm, for it is the most unlikely thing that the building will collapse. Still, in view of the fact that the borings already made for drains and railways have undoubtedly affected the stability of the building, it is well to exercise every care in the future, especially as it is proposed to construct another underground line close to the south side of the cathedral; and in this connection it is interesting to note that in the case of the Mansion House the horizontal influence of the Central London Railway was found to be effective at a distance of 100ft., and the result was the appearance of a great crack in the walls of the building.



THE LOUVRE, PARIS: FRONT TO THE RUE DE RIVOLI. THE WORK OF PERCIER AND FONTAINE. DRAWN BY H. F. COOKE.

Drawings or Photographs of Buildings? It is needless to dwell on the great changes which have been effected by the development of photography, but its influence on the representation of architecture is noteworthy. In former days drawings of buildings were universal; now the photograph is replacing them to a remarkable extent, and at this juncture it is opportune to note the remark of Mr. Ernest George in his official report on the architectural exhibits at the Paris Exhibition (published in our last issue) to the effect that America was represented only by photographs of executed works; and of these Mr. George said that they made the most reliable statement of the present position of architecture in the United States. A clever draughtsman can do a great deal with a drawing—he can play the trickster with wondrous skill; and though this need not necessarily be so, the tendency lies that way. As a result architects have welcomed photographs as a truthful means of representation. One is glad that it is so and that the practice is becoming all-prevalent. Photographs show the building as it is (excepting the colour, for which we must wait a little while), whereas the drawing often tends to enhance or detract from its appearance. Yet there is another side to the question. Intentionally or otherwise photographs may lies, though perhaps not to the same extent as drawing. There are matters of exaggerated perspective, false contrasts of light and shade, and features made unduly large owing to their proximity to the camera; and these things need to be guarded against. Then there is the much-debated subject as to whether a photograph may be a work of art. For ourselves we should say that in ninety-nine cases out of a hundred it is not, being merely the pictorial representation by light and chemicals of a given subject, combined with a certain amount of skill on the part of the operator. But as a practically truthful method of depicting architecture it is undoubtedly of the greatest value, and in this respect infinitely superior to drawing. Whether we should prefer a perfect photograph of, say, Tintern Abbey, or a drawing of it by a master hand is another matter which we do not propose to enter into now.

THE A.A. EXCURSION TO CIRENCESTER.

WITH SKETCHES BY R. M. BUTLER.

ON Saturday afternoon, July 20th, a good proportion of the excursion party assembled at Paddington and journeyed down to Cirencester by the 3.15 train. Sunday is a day not recognised on the official programme, nevertheless a little outing to some place of interest is usually arranged in the afternoon. Accordingly about a dozen members had a pleasant drive in brilliant weather to Northleach, about 10½ miles distant. There is an interesting parish church here. It boasts some good traceried windows, a fine south porch, a small and rather delicate stone pulpit and an old font. The church is of the Perpendicular period. A feature is the nine-light window in the eastern gable of the nave. The piers of the nave have a pleasant effect, due to the hollowing out of the sides of the octagon and to the mouldings following that contour.

WISHANGER

Monday was entirely a day of churches, and a very pleasant day too. The official programme of the excursion opened with Ampney Crucis—a typical Gloucestershire small parish church, chiefly of Perpendicular date. In the north transept is a large Jacobean tomb. It is more quaint than beautiful, and to whose memory it was dedicated no one knows. There is a Norman chancel arch, and traces of ancient decoration are discernible. On the drive to Fairford, Poulton village and a small church at Maisey Hampton were passed without stopping. Fairford was the next stopping-place. The predominating feature is the central tower, of very rich character. It has a cusped and pierced quatrefoil parapet—pierced battlements are a feature of Gloucestershire churches. Internally the tower has elaborate and very excellent groining and tabernacled work. Fairford is famous for its ancient stained glass. With the exception of King's College Chapel, Cambridge, and Malvern Priory, it has probably the largest collection of old glass in the kingdom. Some of it is very disappointing, notably the western window, which is full of crude colour; but other windows—notably those in the clearstory—are delightful. There are a good chancel screen and choir stalls and brasses.

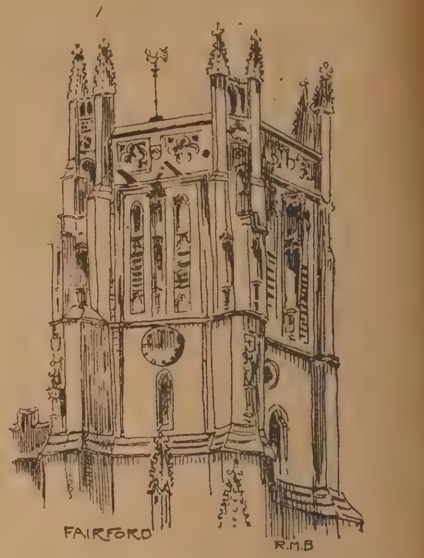
At Kempsford the party was met by the vicar, who pointed out the chief matters of interest and very kindly entertained the members to tea. It was at Kempsford that John of Gaunt wooed and won his wife. There is a finely traceried tower window. The tower is groined internally, and has been decorated by a former curate, the Rev. Mr. St. John. The effect is particularly rich and mellow. There is a tomb to a canon regular whose name and deeds have become lost to history, and there is some good modern glass by Kemp. The present vestry, formerly the south porch, has an exceptionally fine Norman doorway. Some years ago Street added a morning chapel, restored the church generally, and designed a new pulpit and font—all, it must be confessed, in very bad taste and entirely out of keeping with the church.

The church, gatehouse and manor of Down Ampney concluded the day's work. The church spire and battlements are grafted on to an Early English tower. There is a beautiful modern rood screen, designed by Mr. Ponting, of Gloucester. The manor is the property of Lord St. Germains; it formerly belonged in turn to the Craggs, Vilers and Hungerfords. Little of it remains except the hall. The gatehouse is, however, fine.

On Tuesday train was taken to Stroud, where carriages met the party. A long and steep ascent of three miles brought them to Lypiatt Park, the seat of Sir John Dorrington. The house is picturesque, but greatly pulled about by unhappy restorations. An old print of the house in 1624 is extant and shows considerable differences. Writing at the same date, Thomas Stephens speaks of his "faire house of stone at Lypiatt." The Gunpowder Plot is said to have been hatched at Lypiatt (the panelled room of the Conspirators is shown to visitors), and Fawkes is still a common name in the neighbourhood. The gardens are the great beauty of the place: they were well illustrated in "Country Life" some time ago. The view across the valley is most charming. The programme was at this stage altered by the addition of Througham, a most acceptable item, for it proved to be about the most interesting place of the day. Througham Manor, now a farmhouse, is a typical Gloucestershire house. It forms one side of a farmyard, with a picturesque columbarium. The gables form characteristic features of the Gloucestershire manor. Througham is a good example of this. As a rule the work is simple, but very effective, a fairly "quick pitch" to the gable; the rough stone tiles covered with lichen, and the grey walls, form a pretty picture. The boundary walls met with along the roads are usually built of dry masonry. The bulk of the work is of the seventeenth century; Georgian work is comparatively rare, a contrast to last year's tour in Suffolk.

Wishanger Manor is of the usual type, and is now a farm. There is a good entrance porch, with a sundial over it and the arms of the Partridge family. It bears the date 1721.

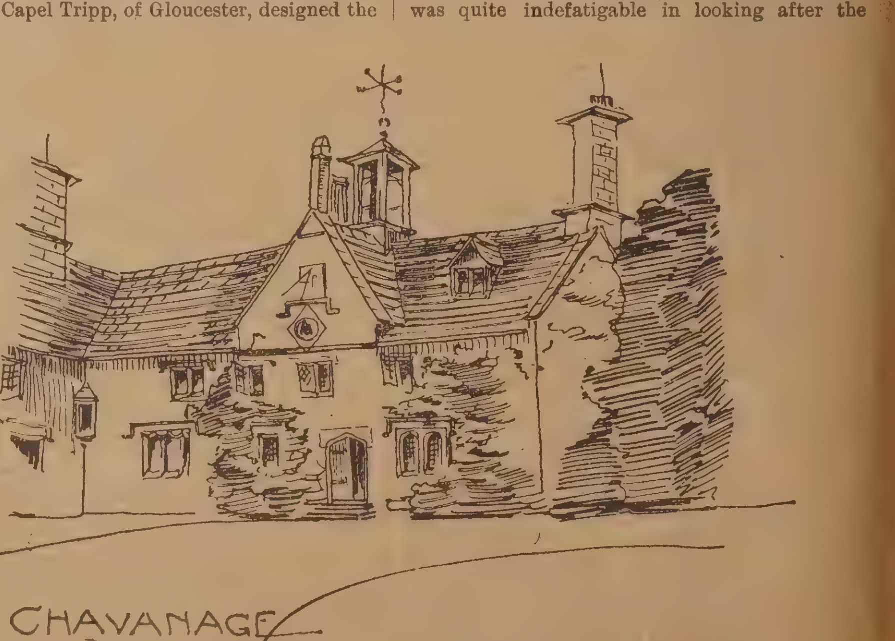
Edgworth has a small but pleasing church, with quaint gargoyles to the tower. The manor of Edgworth is very interesting. The original house dates from 1685, but only about four rooms remain. The present house has just been completed from the designs of Mr. Ernest George, and is a most charming example of his skilled method of work. There is some excellent plasterwork from Mr. George's designs, modelled by Priestly, while the fibrous plasterwork in the bedrooms is by Jacksons, of London. All of the iron and ornamental metalwork was executed by Mr. Starkie Gardner. About twenty years ago Mr. Capel Tripp, of Gloucester, designed the new wing which, prior to Mr. George's advent, formed the chief part of the house. The party was most kindly and hospitably entertained by the owner, Mr. James, who, with his brother, guided the visitors through the delightful woodlands of his park to the summit of a hill where carriages awaited them.



On Wednesday the weather, which hitherto had been bad enough, showed itself at its worst. Doughton Manor, a farm belonging to Captain Arthur Mitchell, was reached in brakes from Tetbury Station in a perfect downpour. It is probably one of the most interesting houses, but unfortunately the elements prohibited outdoor sketching. Many occupied themselves, however, in measuring up the plan and the interesting panelled dining-room. "The Hermitage" is another good house close by. At Doughton the Elizabethan mantel bears the date 1641.

Malmesbury Abbey was next visited. The beautiful church, with its grand Norman nave and noble south porch, were duly admired, as was also the well-known Market Cross; but exigencies of space forbids any detailed description.

Charlton Park, the seat of the Earl of Suffolk, standing in a noble park and approached by a grass drive, is a splendid example of Elizabethan work. The domed entrance hall, chiefly of eighteenth-century work, but not fully completed till about thirty years ago, was formed by covering in the courtyard. The noble owner, Lord Suffolk, is now acting as aide-de-camp to Lord Curzon, the Viceroy in India, but Lady Suffolk very hospitably provided tea for the visitors, while Mr. Bates, the estate steward, was quite indefatigable in looking after the



CHAVANAGE

party and ensuring that they missed nothing which was of interest. Charlton is illustrated in Mr. Gotch's book (the actual plan seems somewhat different to that given by Mr. Gotch), but a good deal of the so-called Elizabethan work is of eighteenth-century date. Of course the main front is genuine and a splendid example of the period.

On Thursday train was taken again to Tetbury, and a short drive brought the party to Beverstone Church and Castle. The rector, Mr. Evans, showed the visitors around. The castle is a picturesque group and boasts some historic traditions. The chancel screen in the church is a curiosity. Sixty years ago it was taken down to make a summer house for the rectory garden. Falling to bits, it was eventually entrusted to the care of Mr. Waller, architect, of Gloucester, to whose skilful treatment is due the present satisfactory restoration. There are some good tombstones of early Georgian date here.

The remains of the ancient moat around the castle may be traced. The chief object of interest is the Berkeley chapel, with a good sedilia and curious angled piscina. Marks of the sword slashes of the defenders are still traceable on the stone joints of the stair. A hole through which prisoners were lowered to the castle dungeon is also shown.

Chavenage House was the chief event of Thursday. The president of the A.A. (Mr. W. H. Seth-Smith) has written a very readable little monograph on Chavenage. This house is picturesque, and a good example of an Elizabethan house of its class. The original house, erected by Edward Stephens, probably dates from 1567 (the date on the label over the porch), and some additions were made by Richard Stephens in 1684. Some unfortunate restorations which have quite spoiled the aspect of certain portions occurred in 1803. There is a decorated two-light window, and the plaque over the doorway appears to have been brought by Richard Stephens from Horsley Priory, which passed by exchange into the possession of Bruton Priory in 1371; after the dissolution of that house, it was granted to Sir Walter Deniss in 1533. The bulk of the house would seem to be of Elizabethan date. The hall has a very fine Elizabethan chimney-piece and minstrels' gallery, the latter apparently made up of odd pieces. There is also some very good tapestry and some charming old glass—mostly Dutch. The coved ceiling of the minstrels' gallery is beautifully panelled, as was in all probability the entire ceiling of the hall.

Upstairs the quaint rambling passages and communicating rooms, panelled and tapestried, give a delightful old-world charm to the house. The arms of the Stephens appear in various positions: *per chevron azure and argent in chief, two falcons rising*, and the crest, *a demi eagle displayed*. The chapel is interesting for a curious little Norman font and an Elizabethan altar table.

Chavenage is associated with many historic personages. Cromwell resided here, as did also General Ireton and Sir Philip Sydney. Later, Queen Anne occupied one of the bedrooms. Chavenage now belongs to Captain Lowsley-Williams, who is at present in South Africa. The members of the Association received a very kindly welcome from Mrs. Lowsley-Williams, who had travelled from Cheltenham specially to meet them and gave them afternoon tea. Before leaving the president took occasion to express to our kindly hostess the thanks of the members and their hopes that Captain Lowsley-Williams might soon return safe and sound from the front, where he has been for almost two years.

On Friday Barnsley Church was visited. It has a very peculiar battered and gabled tower, reminding one somewhat of North Lancashire. A curious old pewter communion service was shown to the party.

Bibury Church has a good roof with cusped windows. On one side of the nave is a Norman arcade of five arches, on the other is a Transitional arcade of five arches. The interior of the church has a rather modern look. The chancel arch is remarkably narrow and the windows curiously irregular.

Bibury Court was perhaps the finest mansion seen on the entire excursion. It is a delightful piece of grouping, a very paradise for the sketching fraternity. The tablet over the entrance bears the date 1622, the date of the main building. The lead water-heads are dated 1759.

·TROUGHAM·MANOR·

A violent thunderstorm held the party for some time prisoners at the "Swan Inn." The next move was to Ablington Manor, the residence of Mr. Gibbs, whose late brother made Ablington quite famous by his book, "Life in a Cotswold Village." The entrance front is really a beautiful picture. The garden front is of comparatively later work (Georgian date). Mr. and Mrs. Gibbs entertained the party to afternoon tea.

In the evening the time-honoured "smoker" (somewhat tame this year) took place, and a comparison of sketches brought the active work of the week to a close.

Saturday, the day of parting, was devoted to Cirencester. The main feature of the ancient town is the splendid church of St. John the Baptist, with its fine tower. Like Fairford and several other churches of the district, this church has a five-light window over the chancel arch.

The old guild hall over the south porch of the church was early in the sixteenth century built at the sole expense of Alice Avening (whose nephew was afterwards Bishop of Durtman.) There is plenty of work to occupy the student for long weeks in this church, but space forbids any details. There are many quaint gabled houses, but few of any great interest. The seat of Earl Bathurst beside the town has a magnificent park—one of the finest in England. His lordship, in command of the Fourth Gloucester Militia, arrived home from St. Helena on July 20th and was accorded a very warm welcome.

EDGEWORTH CHURCH

An hour or so was spent in Tetbury, where there are some good stone houses and a quaint market-house.

The general feeling of all the members was that the week, with the exception of the bad weather, had been a very successful and enjoyable one, the only cause for regret being that so few new men of the younger generation had joined this year, a circumstance for which it appears difficult to find excuse.

TRURO CATHEDRAL.

PROGRESS OF THE BUILDING.

THE architectural conception of the late Mr. J. L. Pearson, R.A., in Truro Cathedral is gradually receiving a more complete presentation. Only a fragment of the full design has for years past been in existence. But a great change is being effected by the building of the nave, and in a very few years that important addition will be completed and the great central tower will be reared. When the work at present arranged for is finished the only conspicuous omission from the design will be the two western towers. Mr. J. H. Dennis has generously provided £15,000 for the central tower, and the opportunity is now available for some other munificent donor or donors to give the £12,000 requisite for the two western towers.

The towers at the west end of the nave have now been carried up 70ft., the height provided for in the last contract. To complete them would mean the addition of 130ft. to the top of the spires. The walls of the nave are up to the same level as the towers, and the roof-timbers for the nave are being prepared. The gable and turrets are up to 74ft., and the statuary for the niches at the top has been ordered. There will also be two medallions on the western gable. A large number of statues will be required for the narthex, or tower of the western porch, and similarly for the southern porch when undertaken. The stone tracery of the great window in the western front has already been fitted. The date stipulated for the completion of the nave was January 31st, 1903, but since that contract was made an additional order has been given for the carrying up of the western towers to the level of the roof of the nave, being a height of 70ft., instead of 32ft. as at first contemplated. If everything goes well the roof of the nave may possibly be finished this year.

Preparations are now being made for beginning the great central tower. This will be carried on independently of the nave, and will necessitate separate scaffolding and hoisting arrangements. The extent of the task may be gauged from the fact that about two thousand tons of stone and other material will have to be hoisted for the erection of the tower. A small portion of the tower already exists beneath the temporary roof, the highest point being nearly 100ft. It is very nearly square, measuring 35ft. from east to west and 36ft. from north to south. The tower at these dimensions has to be carried up another 56ft., and from that height the spire will spring to a complete altitude of 250ft. from the floor of the cathedral. The tower will contain two stages of windows. The smaller lower set will be glazed with tinted cathedral glass, and the upper will be filled in with oak luffers covered with copper. The base of the great spire will be surrounded with four spirelets and four lancet windows, rising from the parapet of the tower. Like the other exterior work, the tower will be built of Mabe granite and Bath stone, the latter being treated with fluate to make it more durable. At the stage of the present matchboard ceiling inside the building the central tower will be groined over. Elaborate precautions are being taken against mishap. Thirty squares of strong boarding are being placed upon the roofs of transept, choir and baptistery for protective purposes. Inside a temporary floor covered with lead will take the place of the wooden ceiling, and a few feet above that there will be placed a strongly-constructed platform to receive the engine and interior scaffolding. Seeing that this is at a height of about 100ft. right over the centre of the building, where congregations assemble, the advisability of these careful precautions is manifest. The work throughout has been executed on the safest lines, and the result has been a complete absence of serious accident. The outside scaffolding will be kept separate from all roofs, and will be supported by great baulks of timber over 50ft. long.

GATE HOUSE DOWN AMPNEY

The open ground to the north of the cathedral is a scene of busy activity, and the former quietude is disturbed by the sound of many chisels and the grind of the mortars. On an average nearly 100 men are employed, principally composed at present of masons and carpenters. The clerk of the works (Mr. E. T. Price) has the oversight of an enormous amount of detail. The plans and sketches are huge in bulk, and altogether nearly 1,200 of them have been prepared for the different departments. The architect (Mr. Pearson) inspects and signs all the plans before they are utilised. Mr. Price has had a very large experience of ecclesiastical building, having superintended the erection of several churches and other buildings for Mr. Pearson. The contractors, Messrs. Willcock, of Wolverhampton, are represented by Mr. Yeatman.

In the course of time the rectory, which is overshadowed by the nave on its north side, will be demolished, and the site will afford some, at any rate, of the surrounding open space necessary to a proper display of the cathedral. The complete plans include on the north side a chapter-house and a large cloister court; but in view of the strain which has been already imposed to obtain the money needed for work in hand, these portions of the building will have to be delegated to the attention of posterity. If only the two western towers could be compassed the present generation would enjoy the satisfaction of completing the really essential portions of Truro Cathedral.

New Church at Goole.—A new brick and stone church, dedicated to St. Paul, has been erected in the North Ward, Goole, at a cost of about £4,000. When completed it will accommodate 730 persons, and will consist of nave and aisles and chancel with north aisle. The architects are Messrs. Brodrick, Lowther & Walker, of Hull and Bridlington; the builders being Messrs. Jackson & Dimberline, of Goole. The terracotta was supplied by Mr. J. C. Edwards, of Ruabon.

TIMBER.

Some Interesting Particulars of the World's Supply.

We have received from the Philadelphia Commercial Museums a report on the lumber trade of the United States, prepared by Mr. O. P. Austin, chief of the Bureau of Statistics, Treasury Department. The principal timbers of commerce in the United States are those known popularly as pine, fir, oak, hickory, hemlock, ash, poplar, maple, cypress, spruce, cedar and walnut. Pine and fir predominate, but oak, the first of hardwoods, still holds its place for variety of serviceableness.

Timber forests constitute the raw materials of the lumber trade. Hence countries where the timber supply has been more or less exhausted, or where timber cutting has been brought under restrictive control of public authorities, must sooner or later cease from contributing to the world's supply of lumber for international trade. Only five European countries now export timber in any considerable quantity. These are Russia, Sweden, Norway, the Danubian provinces and Austria-Hungary. Even the Austro-Hungarian stave trade is gradually being transplanted to the southern Mississippi Valley for want of a timber supply adequate for that trade.

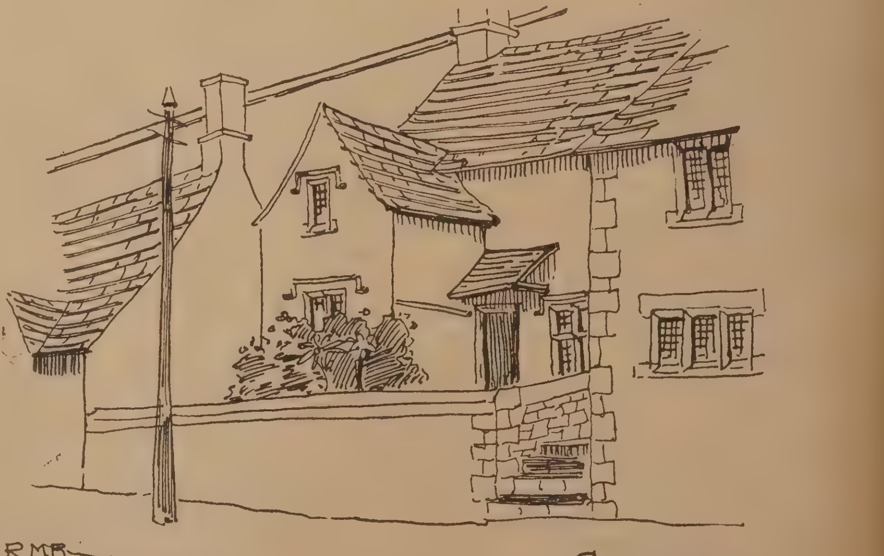
By far the greater portion of the world's timber resources of commerce are now to be found in the New World. Canada and the United States are the greatest exporting countries for the more usual species of timber products, such as pine, fir, oak, maple and spruce. The ornamental woods such as mahogany are derived mainly from the tropical countries of the West Indies, Mexico, Central and South America, though Africa, Hawaii and the Philippine Islands are sources of rising importance in this species of hardwood. New South Wales, the best timbered division of the Australian colonies, has twelve leading species of hardwood trees suitable for export. Nevertheless, the lumber fleets of the Pacific coast of the United States and Canada, whose ships carry lumber to every continent, show that even for the well-wooded islands of Australasia the main source of their foreign lumber supply is still North America.

The demands of modern consumption have greatly enlarged the varieties of useful woods. As older standard varieties became scarcer, newer varieties appeared as substitutes. In not a few cases these substitutes proved to be superior for certain uses to the woods they displaced. As the uses for woods multiplied with modern progress in industry and in standards of living, the distant parts of the earth began to contribute to the demands of Western countries. Thus the jarrah woods (*Eucalyptus marginata*) of Australia came into use as a superior wood for service in contact with soil and water. The karri wood of the same country became known as the world's best wood for paving purposes. The cypress of the South, once wholly neglected as useless, is now a standard shingle wood, and the redwood of California, practically unknown fifty years ago, is now as widely known as the lumber trade of the world.

The Future of the World's Lumber Supply.

It has become the fashion in this age of rapid economic development to make enquiries into the probability of exhausting natural resources such as the mines, the oil fields and the forests at the present rate of exploitation by extractive industries. For twenty years or less there has been considerable apprehension of an impending timber famine. Industries whose dependence upon timber resources is direct have looked upon the disappearance of forests and original timber growths of the country with no slight fear for the future.

A recent volume by A. Mélard, a French official, on the lumber situation in the world's trade, sounds a note of alarm at the astonishing rate at which consumption is proceeding in the leading countries of the world. This is indicated by the small proportion of forested area to total land area and by the vast difference between imports and exports. France, it is estimated, consumes about 20,000,000 cubic metres for firewood and about 6,000,000 metres of lumber, nearly half of which latter requirement has to be imported. England, Germany and Belgium are in a similar position, as in all these countries the industries requiring lumber as materials of development are in a most flourishing condition. For the present these deficiences in lumber supply are made up from Austria-Hungary, from Sweden and Norway, from Finland, from Russia, from Roumania, from Bosnia-Herzegovina and from the United States and Canada. These deficiencies, according to M. Mélard, are made good by the continuous destruction of forests. The world as a whole, especially the



·COTTAGES· ·AT·BIBERY·

European and North American world in the north temperate zone, is rapidly exhausting its capital investment instead of living on its yearly interest in the lumber resources of these nations taken as a whole.

According to this view, the peoples of the north temperate zone, in which most of the existing supply of commercial timber lies, have every reason to face resolutely the question of a future supply. That question can be answered in only two ways. Either the increase in lumber values must reduce the rate of timber exhaustion or the exhaustion of the now available lumber supply must drive these industrial nations to seek new supplies elsewhere. Then, if the uses of lumber are to continue, there will be three sources available—namely, Northern Russia, Argentina and Australasia—for a non-tropical timber supply.

Russia, though not a well-wooded country, has two regions on which Europe will rely more and more for lumber as the American supply is restricted or rises in value. These are in the extreme north and the Ural region, the former of which has 57 per cent. of its area wooded and the latter 45 per cent.

From the sub-Arctic and Ural provinces we must look for the rising of an enormous trade once the difficulties of transportation to Europe by way of the northern rivers and the White Sea are overcome. Four of these provinces, lying in the north-east between the Ural Mountains and the White Sea, largely within the basin of the Dwina river, contain 62 per cent. of the timbered area of Russia proper, excluding the Caucasus and Siberia.

The Want of Transport Facilities.

When we turn to the south temperate zone we find the same backwardness in transportation facilities for marketing lumber. Argentina's forest resources are among the richest in the world, but, unlike those of the United States, they are remote from the ocean, and thus expensively reached, if reached at all.

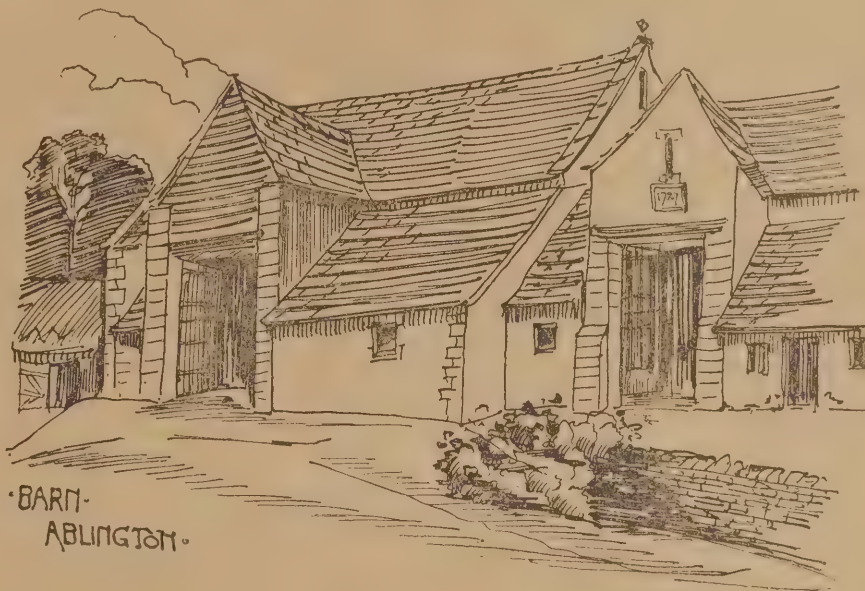
The forests of the interior of Argentina, throughout the north and the north-west, on the eastern mountain slopes and in the valleys of the Uruguay and Perena rivers, are famed for their richness in timber resources. In this country there are fully 500 varieties of woods, with no less than 100 of high utility in commerce. But the richer timbered areas lie remote from the seaboard and away from the centres of consumption. Hence, here, as in Brazil, it is often cheaper to import lumber than to cut it at home. Brazil has a tropical profusion of useful woods. In the province of Amazonas alone there are thirty kinds of building lumber and thirteen kinds available for cabinet uses. But labour is scarce, and the means of transportation are so imperfect that the production goes little beyond the demands of local consumption. Commercial lumber is largely imported, primarily from the United States and secondarily from Sweden, though England and Germany import cabinet woods into Brazil quite extensively. As to Argentina, the exports, mostly to Europe, are of growing importance. Most of this lumber goes to the cabinet-makers of France and Germany. But here, too, there is a reckless disregard of the future. "It is sufficient to say that the damage and destruction under the present system are greater to the country than the profits," declares the Buenos Ayres nation.

Australasia is well supplied with varieties of wood, both hardwoods and pines; and with eastern Siberia and the interior of China the Far East will not be wanting in much. The hardwoods of New South Wales are remarkable for the length of the trunk and for the strength and the durability of the wood. The absence of branches for the greater portion of the height—rarely less than 100ft. being clear—makes these timbers suitable for structural purposes in private and public works. The United Kingdom imports timber to the value of £20,000,000 in round numbers annually; and to this market the Australian trade has been giving special attention, with slow but sure encouragement. A differential tariff in favour of Colonial imports might prove decisive in transferring the main portion of this timber trade to Canada and Australia and away from the United States.

AN INDIAN BRIDGE.

BUILT BY AMERICAN ENGINEERS.

THE far-away corner of the earth known as the Shan State of Thibaw has probably little interest for people at home, should they happen to have heard of its existence; yet, being on the borderland of two vast Empires, and a buffer State between two ancient civilisations, it is not without its own interest both past and present. Lying in the wide belt of hills between Upper Burma and Southern China, the State of Thibaw has always been traversed by the old caravan route from Yunnan to Mandalay. Long before the British took Burma the trade of the Far East filtered through to Mandalay by slow stages up and down the rugged hills and valleys, through thick jungle and over mountain torrents, finally descending the Ghaut, and emerging on to the open plain. Now all this is changed; the iron road winds up the hills and over the plateaux between Mandalay and Thibaw. Soon it will be carried further still, and some day the old route will be superseded for its whole length by the railway.


·BARN·
ABLINGTON·

A very serious obstacle on the road was the Gokteik, and those who have seen the bridge across it which was opened on June 1st can best realise the difficulties faced and overcome by the engineers of the line. The surrounding scenery is very lovely, reminding one of the Canadian Rockies, only without the background of snow mountains. Green ridges and jungle-covered slopes carry the eye up to the high lands lying between the yet higher hills that stretch, blue, peak beyond peak, right away to China. The Gokteik valley winds in and out of these hills, directly athwart the Mandalay-Thibaw road. It is not a simple valley, but one of interesting formation. It slopes from the hills on one side to the foot of precipitous crags, veritable cliffs in parts, on the other, but just where it would touch their feet a deep cañon winds, almost a sheer drop 500ft. down, to the brawling river that follows its course below. Yet is this deep moat no barrier to man, for from the level of the valley to the face of the cliffs there is a natural bridge or causeway of rock, tunnelled at the bottom by the river. When the railway was surveyed and it was planned to bridge the valley and the gorge it was decided to utilise this piece of Nature's engineering, and some of the piers of the steel bridge rest on this natural bridge or causeway.

The steel bridge is more than 2,000ft. long and its deepest pier is 325ft. high. It is a trestle bridge, built by the Pennsylvania Steel Co., U.S.A. It is approached on each side by a gradient of 1 in 40.

A New Wesleyan Church at Stamshaw, Portsmouth, is to be built from designs by Mr. G. E. Smith, of Southsea, at a cost of £4,650.

EAST SUSSEX ASYLUM.

THE NEW HELLINGLY BUILDING.

THE erection at Hellingly of the new lunatic asylum for the administrative county of East Sussex is proceeding apace and in a satisfactory manner. The undertaking—in point of expenditure the most important in which the East Sussex Council has been engaged—represents the practical solution of the difficulties of accommodation involved in the joint use of the Haywards Heath Asylum. The committee was most fortunate in securing the services as architect of Mr. George T. Hine, who is generally recognised as one of the highest authorities on asylum construction. The average number of men employed on the works is about 500. The difficulty is not so much in dearth of labour: workmen are plentiful, but the accommodation is extremely limited. The whole of the foundations have been laid, a separate contract for this work having been executed by Messrs. Wilcock & Co, of Wolverhampton. The contract for the superstructure was secured by Messrs. Howe & Co., of West Hartlepool, and this work is still in an elementary stage. Generally the main building is to be two storeys high, and roughly speaking the first is completed. A few of the smaller buildings such as workshops have been roofed, but the superstructure of the majority of the detached buildings has not yet been commenced. Red Leicester brick from Ashby-de-la-Zouch, with white Bath stone dressings, is being used, and red tiles will be employed for the roofs. A fireproof system of building is adopted. The main building covers about twelve acres, but the whole estate comprises no fewer than 400 acres, the freehold of which has been acquired from the Earl of Chichester. The acute hospital, which will provide accommodation for fifty females and thirty males, will be constructed on different lines from the main asylum, and every opportunity will be afforded the doctors for special and separate treatment of the patients, who will not be under the necessity of suffering the terrible evil of associating with confirmed lunatics.

The main hospital, in which accommodation for 840 patients of all classes will be found, is being built on the echelon principle. There is a wide base at the north, narrowing down to the south, so that the wards and dormitories, which face this direction, will get as much sun as possible, and will consequently be light and cheerful. The main entrance is in the middle of the north base, and immediately on the right and left will be waiting-rooms, committee-rooms and offices. The right wing will be devoted to male patients and the left to female. In the centre will be the surgery, dispensary, kitchens, store-rooms and similar offices; while to the south will be the assistant medical officer's quarters, which will be connected with the main building by a corridor. The asylum is being built to accommodate 1,115 with provision for extension to 1,275, arranged as follows: Acute hospital, 80 patients; main asylum, 840 patients; four detached villas, 120 patients; idiot block, 60, and rooms for 15 quiet female patients to assist in nursing the children. The remaining 160 patients to complete the ultimate number will be provided for in further blocks attached to the main asylum or more villas, whichever is found in experience to be the most desirable. Before the land was purchased the committee made sure that water was to be found on the estate, and boring operations are now in progress. A tower 100ft. high is being erected which will contain three cold-water tanks having a storage of 22,000 gallons. The water will be conveyed all round the building by a 6in. pipe, and a hot-water service will also be available. The asylum will also have its own sewerage works, the outfall being on the lowest point of the estate. The main building is 130ft. above the sea-level, and as the sewage farm is only 65·4 the sewage will be conveyed to the outfall works by gravitation. Here the solids will be destroyed by septic tanks and the clear effluent allowed to pass away.

NATIONAL COMPETITION DRAWINGS.

By S. S. G.

MOST of the National Competition drawings now on view at South Kensington (in a building which requires looking for) reach a fair average of attainment without showing striking excellence. The involved line and exaggerated curve, so distinctive of the later developments of Continental design, are not quite so much in evidence as they were last year, but there is still too great a tendency to imitation of the peculiarities of certain well-known designers and a suggestion of endeavour to work on the lines most likely to prove acceptable to individual examiners, which is scarcely healthy. Twelve gold medals have been awarded, and while some of them have been very easily gained most are well deserved; the silver medals number 127, and the bronze no fewer than 358, besides which 741 national book-prizes have been given, so that the student who is possessed of any talent may almost make sure of some reward—a most comfortable and encouraging state of things for those whose object in studying is the gaining of distinctions. It seems scarcely just that the same award should be made for the pretty but slight design for a printed muslin which takes a gold medal, a repetition of three sprigs of flowers, one of which only is well designed, and small butterflies, delicate and sweet in colour though it be; and the fine sets of measured drawings of the Priory Church, Great Malvern, and of All Saints' Church, Hawton, which also receive gold medals. But these inequalities cannot always be avoided, and the really important thing is that each drawing so premiated should be the best of its class; though it might also be borne in mind that high awards are one means of encouraging effort in directions in which study is thought desirable by the examiners. We are glad for this reason to see a gold medal given for a set of studies of historic ornament as well as for the architectural drawings already mentioned, and wish the examiners could have found it in their hearts to give one to the very fine set of studies of flowers treated for design from Manchester, which are drawn with absolute mastery both of form and manipulation and are pleasant in colour withal, since such studies are of the greatest possible value to the designer, and should therefore be encouraged.

The variety of subject in the architectural measured drawings is commendable, and shows breadth of view in the examiners. The drawings are most of them good and some excellent, and Gothic and Renaissance work is drawn with equal enthusiasm. The gold medal drawings already referred to (there is a second set of Malvern Abbey), the elaborate tower of St. Giles's, Wrexham, and St. Mary's, Warmington (very delicately worked in pale sepia), are Gothic, while Kirby Hall, St. Nicholas, Worcester, the Custom-house, King's Lynn, Nottingham Castle, Westwood House (with a very dainty general sketch), and the staircase of Fyvie Castle give equal prominence to the styles of the Renaissance; and some sheets of tinted drawings from Ely and Cambridge, Worcester and Gloucester, show impartiality in choosing subjects from both styles. Another set shows the market halls of Ledbury, Ross and Chipping Campden; and ironwork, plasterwork and monumental sculpture are also shown in other sheets of capable drawings. The section of architectural design is not so satisfactory. The Scotch designs show massiveness and solidity of treatment, and an artist's country house gives opportunity for picturesque arrangement, but most of the designs are reminiscent of the work of others. A pretentious design for a public gateway to a park relies a good deal upon badly drawn and composed figure panels and groups, which do not redeem it from the commonplace.

The stained glass is better than last year, and one or two sketches of arrangement are good in colour; but almost all are conceived too much from the pictorial standpoint, and silhouette and contrast of colour have not been sufficiently considered, the result of which is that the leads are obtrusive and clumsy, which they are not in a well-designed window. The schemes for decoration are not very good, students generally either making the mistake of over-decorating, and so losing breadth, or in striving after novelty of form or colour falling into the bizarre, which is never restful. There is a design for a day nursery with panelled walls and frieze; both frieze and panels to within 2ft. from the ground are filled with painted subjects, which make the room look as if decorated with the pictures from Christmas numbers (perhaps a virtue in this case). A design for a music room from Nottingham, although conventional in the modern fashion in much of the ornamental detail, is a thoughtful scheme which is pleasant in colour and tastefully arranged. A high panelling surrounds the room, above which is a plastered wall recessed beneath round arches which support a coffered ceiling; the colour is mainly greens and dull blues, with a little red here and there. The mosaic designs are poor, though one set shows considerable feeling for colour. The students appear to think the material suitable for surfaces near the eye. Their masters should have taught them better! The tiles are not of much account, but one is glad to see examples of pressed tiles filled in with coloured glazes, a very effective mode of using the material, as might be seen last year in Paris and now in several showrooms in London. Some of the sgraffito pottery is fairly successful, and here too one is glad to see the actual articles manufactured as well as the drawings for them.

The gesso work is frequently well designed and executed, but applied often to objects which will be much handled, such as bellows and hair brushes, for which the material is manifestly unsuitable. A few examples of carving are interesting, especially a portion of an overmantel well begun and not badly designed (from Worcester) and another from Swansea with cherubs' heads well carved but rather over high in relief. The design of the mantelpiece to which this latter belongs is a most curious mixture of Wren and "L'Art Nouveau." Some of the modelled design is good, especially that for metalwork, but here the tendency to play up to the examiners' presumed preferences is very evident; a clumsiness of general form and a misunderstanding of architectural requirements and of the material intended to be used are also noticeable, and a want of scale between the figures and the ornament or enrichments of mouldings. It would be advantageous for these students to go through a course of architectural study, which would not be amiss even for sculptors of greater reputation. The designs for cast metal resemble *repoussé* too much, and lack the qualities required for the process; and some of the wrought-work, while suitable and not ineffective in detail, is clumsy and even ugly in general form. These remarks apply to both iron and brass work, and the latter is often very ungainly in general outline, showing a good deal of "Art Nouveau" feeling in the detail, which is sometimes moderately successful. The executed objects in enamel show aspiration, but are not very excellent. The process is difficult and requires experience, and though success is not reached, strivings after beauty of colour are evident, especially in the jewellery, some of which is pretty and delicate; this is the most successful section of the metalwork on the whole and much better than such things used to be. Students may be reminded, however, that although the contorted lines characteristic of the latest French and German jewellery are suited to a ductile material such as gold or silver, mannerisms of form become offensive when often repeated.

The embroidery includes a number of articles entirely or partially worked out which show great ingenuity and variety of stitch and effect. It may be presumed that it is this quality which gained the gold medal for a piece of work which is poor in design and badly drawn. A portion of a portière from Salford is as successful as any in colour and richness of effect; and in a screen from Bradford stencil and embroidered lines in high relief with gold lines added are used with great effect, though one may have doubts of its permanency. The designs generally are rather too liney. Many of the stencils are over fussy; a few are good in colour and fairly good in arrangement, but the lines are generally too involved and twisted for satisfactory effect from a distance, which should be a consideration in stencil design. The wall papers are poor. The bizarre is frequent and sometimes becomes the ugly. There are too many spiky forms in many designs, and this makes them confused and sometimes insignificant, though one scarcely expects to find much distinction in the work of students. A few designs for end papers are daintily drawn, and the book decoration is sometimes distinctly talented; but here also the bizarre seems to exert great attraction on the student, and the mannerisms of certain artists find many imitators who do not realise that ugliness is only fascinating when informed by genius, a quality which is incommunicable. There are one or two good stencil cards, but they are not as satisfactory as those shown last year. The book-covers are most of them mannered in a fashion which has been successful of late years in gaining prizes.

The designs for fabric are frequently accompanied by portions of the material in which they have been carried out and with working drawings of a part of the design, showing that they are the work of qualified designers. One could wish for more distinction in the designs—at present they are commonplace or eccentric, according as the designer has aimed at the market demand, or attempted to be original. In the tapestries the lines on which the patterns are set out are too apparent, but the table linen is more successful, though the extravagances of line which are so evident in other sections are also to be seen here. The designs for white work in the embroidery section are often clever, but do not reach the high level of last year, and the same remark may be made about the lace. The printed silks and cottons are dainty in colouring, and some are good in design though too liney, but this defect is much more apparent in the printed muslins, which are also too formal in arrangement. The folds into which these materials will fall when made up would make many of them unintelligible. The designs for carpets follow the ancient lines in several cases with considerable success. Here the Scotch designs are better than the English.

The sections devoted to study of the figure, painting from cast and from life, and advanced modelling, are not so noticeable, and the level of attainment is rather low. Some of the life studies are fairly good, especially the studies of heads. The gold medal drawing shows intelligence in the use of line, and some of the studies of drapery give evidence of care both in drawing and arrangement. The time sketches in pencil are pretty good, and the modelled work about up to the average, while the still life studies are generally too chromo-lithographic. Most of the students do not seem to have realised that the value of such studies is not the reproduction of the objects painted, but the acquirement of power in the manipulation of the brush and the development of the colour sense. One is pleased to see that on the whole in the local personal examinations the candidates have been more successful in the exercises in design than in the other subjects, and this gives one some hope for the future, though the present competition can scarcely be said to show advance upon the level of last year except in the fact that the influence of "L'Art Nouveau" is slightly less marked.

ST. SAVIOUR'S CHURCH, LIVERPOOL.

ST. SAVIOUR'S CHURCH, Huskisson Street, Liverpool, which was destroyed by fire eighteen months ago, was reopened recently. St. Saviour's Church, which was built in 1840, has passed through numerous vicissitudes. It was designed by a Dublin architect, and the estimated outlay at the outset was £12,000.

In the first instance, during 1889, the interior of the building underwent extensive alterations, when the chancel was entirely reconstructed and enlarged. The main walls were painted in various shades of terra-cotta, and this colouring was repeated with pale buff on the galleries and pulpit. Choir stalls were erected of walnut on Classical lines, and the chancel wall was richly coloured. The work throughout was most effective, including pillars, panels, and coloured windows, the latter executed by Mr. W. H. Lonsdale. The improvements at this date included the removal of the old-fashioned high-backed pews, which were substituted by others of a more modern type. These alterations were carried out at considerable cost, which was estimated at about £1,600, and after adding expenditure for repairs to roof, &c., the total amounted to a little over £2,000. The interior of the building was again painted and decorated in 1899, at an outlay of about £400, and a year previous to this £600 had also been expended on external improvements.

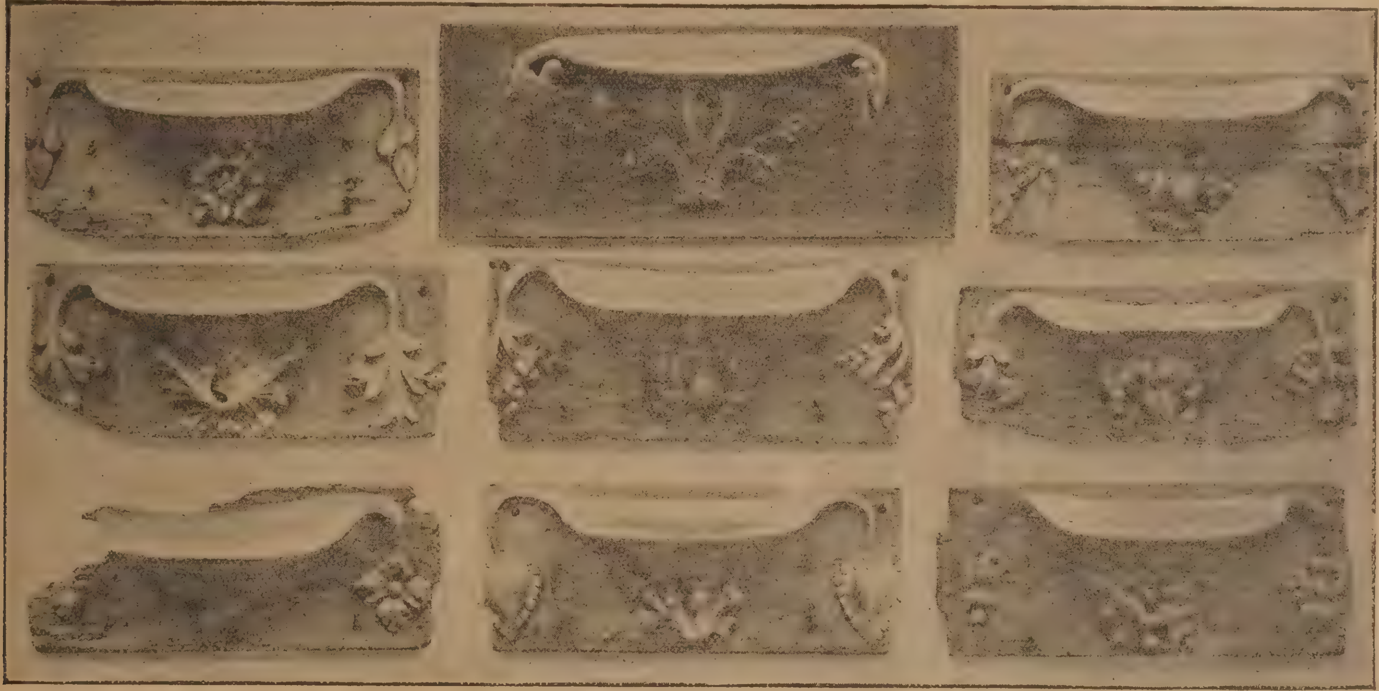
It was at 9.15 on Sunday morning, February 4th, 1900, that the disastrous fire occurred which caused the almost entire destruction of St. Saviour's Church. Starting from a defective flue connected with the heating apparatus, the fire spread until everything combustible was destroyed, including the floor and the roof, the walls and the tower alone remaining standing.

Steps were at once taken to remedy the disaster. A careful examination of the old walls showed that they could be depended on, and it was decided, in order to save time and money, to leave them standing. Considerable changes, however, had to be made. In the old church the chancel was placed at the west end, while the east end was occupied with a series of porches and staircases. In the scheme of restoration, however, this arrangement has been reversed. One side of the tower was removed, the superincumbent weight being carried by steel stanchions and girders, and the rest of the circular Bible porch was converted into an apsidal termination to the chancel. The side porches are changed, one into a spacious organ-chamber, the other into vestries—that for the choir on the ground floor, and that for the clergy upstairs. At the west end corresponding changes were made. Vestries were converted into porches, and the space originally behind the chancel was adapted for use as a baptistry. Thus the axis was reversed, and about 35ft. was added to the length of the church. Another important change has been the addition of a very serviceable basement under the church. Examination revealed a space about 10ft. high under the whole building, which, having no windows, was entirely unused. By removing a foot or so of earth, and raising the floor of the church some 3ft., excavating the ground against the building, and piercing the walls for windows, it has been found possible to provide for the purposes of the parish a mission hall and three good rooms, and thus to supply an institute without requiring a site. In the church itself little will remind anyone of the old building. The galleries have not been replaced, and while the windows under them have been blocked up, those above them have been lengthened. By the substitution of light steel trusses for the immense wood principals of the old building, several feet have been gained in the height of the ceiling, which is curved, and relieved with moulded and enriched beams. Thus the general effect of this edifice is entirely altered. The organ is now being erected in what was the south-east porch by its builders, Messrs. Lewis & Co., of Brixton. The chancel is enclosed by a richly-panelled walnut screen, and the whole of the seating and fittings are made of the same wood of a rich Renaissance design. The floor increases in richness as it approaches the east, the materials being white stone, rock asphalt and Sicilian marble. The east window is to be filled at once with stained glass, the artist being Mr. T. R. Spence, of London. The pulpit is only a temporary one. The whole building, both church and basement, is warmed and ventilated on the Plenum system, fresh air, cold in summer and warmed in winter, being forced in by electric fans, capable of changing the whole of the air, if desired, as often as six times an hour. The architects responsible for the work of restoration are Messrs. Willink & Thicknesse, whose designs and details have been carried out by Messrs. Bullen Brothers & Son, the general contractors for the whole work and the chancel fittings. The nave seating is supplied by Messrs. Haigh & Co., and the heating and ventilation were designed and carried out by Mr. J. A. Wade. These works have cost about £10,000.

New Art Professorship in Rome.—The Italian Government has just created at the Royal University in Rome a professorial chair for the advancement of historical research in connection with mediæval and modern art.

WAKEFIELD'S TECHNICAL AND ART SCHOOL.

THE tenders for the alterations and additions to the Wakefield Technical and Art School, lately taken over by the Corporation, were sent in on July 29th, and assuming that the Local Government Board sanction the borrowing of the £5,500 required by the Corporation for the carrying out of the work, it may be taken for granted that the extensions will be commenced at an early date, and that good progress may be made with the same before the winter months. Mr. Watson is the architect. At the rear of the present building there is to be a new wing, comprising four classrooms on the ground floor, together with a one-storey portion, intended to be used for plumbing and carpentry workshops. This new wing may be reached from the corridor leading from the front main entrance or from behind. Above the classrooms there is to be a chemical laboratory 48ft. by 23ft. and a physical laboratory 22ft. by 33ft., and a lecture hall 22ft. by 24ft., together with a balance-room, a chemical storeroom, &c. This will be reached by a stone staircase, but an iron fire-escape is also to be fitted up behind. The present laboratory and museum is intended to be carried a storey higher, so as to form a large room for elementary art work, 51ft. by 35ft. This additional room will be reached from the present staircase and will, like the new portion, be also provided with an iron fire-escape outside. The floors will be fireproof, covered with wood blocks, and the whole of the school is to be illuminated by electricity.



SOME OLD MISERERE SEATS.

SOME OLD MISERERE SEATS.

THE old miserere seats illustrated on this page were exhibited by Messrs. Harry Hems & Sons, of Exeter, at the recent Exhibition of Works in Wood held at the Carpenters' Hall. One, a specimen of Early English oak carving, is especially interesting. It dates from the time of Bishop Bruere, who was made Bishop of Exeter A.D. 1224, and built the chapter-house and provided stalls for the choir. Of the latter nothing but the fifty miserere remain to-day, and they, as a series, are unique—nothing like them existing in any of our old cathedrals or old parish churches. Messrs. Hems & Sons were enabled to exhibit this specimen by the kind permission of the Dean and Chapter of Exeter. It is as sound and crisp as it was the day it left the carver's deft chisel (nearly 700 years ago), which speaks volumes for the almost everlasting qualities of English oak.

A NEW SOUTHAMPTON BOARD SCHOOL.

A NEW Board school for the Southampton School Board is being erected on a site at the northern end of Foundry Lane, nearly adjacent to the main road through Shirley, being part of the Shirley Freehold Building Estate. It will have three frontages—to Foundry Lane on the east, English Road on the south, and Imperial Road on the west—and will cover an area of 1a. 3r. 23p., the ground being purchased by the School Board for the sum of £1,583. In addition to this there was also purchased a small piece of land with two semi-detached cottages thereon for £586, this forming the south-west corner of the school site. It is intended to utilise these cottages as residences for teachers and caretaker; thus a cottage for the latter is not required now to be built. The main school buildings are divided into two separate oblong blocks, that facing English Road being a two-storey building—for girls on the ground floor and for boys on the first floor. The girls' department contains two schoolrooms, each 60ft. long by 23ft. wide, and four classrooms, each 25ft. by 25ft., connected by a corridor having two separate ranges of lavatories and two hat- and cloak-rooms. The rooms for head teachers' use are placed between the two floors, with staircases leading thereto. To meet the wishes of the Board of Education the arrangement of the four classrooms beforementioned can be converted into the resemblance of a central hall by having sliding partitions and revolving shutter partitions in the place of brick division walls, so when it may be required by moving the partitions these four rooms can be adapted as one room capable of accommodating a large assemblage of children. The boys' department on the upper floor will be approached by two stone staircases, and the general arrangement and planning of the rooms, &c., is similar to that for girls on the ground floor, including the providing of movable partitions to classrooms. The two departments in this building will provide accommodation as settled by the Board of Education for 480 boys and 480 girls. The infants' school, which is a separate block of buildings, is placed at the north end of the site, and the arrangement is one large schoolroom (70ft. by 24ft.) fitted with sliding partitions, six classrooms (23ft. 6in. by 23ft.), a wide corridor that can be used as a marching hall, with narrow corridors as passages to the hat- and cloak-rooms, lavatories and rooms for head teachers, &c. This building will give accommodation for 530 infants. The several rooms will be heated by approved warming grates in open fireplaces, and lighted by Suggs' Taj gas lamps, &c. There are two spacious playgrounds, one for the boys and the other for the joint use of girls and infants. There are also provided covered play-sheds. The property will be enclosed by a brick wall on the north and west sides, and the frontages to Foundry Lane and English Road will have an iron fence, with gate entrances therein to the playgrounds. The exterior elevations of the school buildings are of a very plain character. They will be of red brick, relieved by a little stonework, some coloured brick bands, moulded brick strings, projecting courses to eaves and gables, slated roofs with red ridge tiles, &c. The contractors for carrying out the works are Messrs. Jenkins & Son, of Southampton, at a cost of £17,607. The plans were prepared by Mr. John H. Blizard, architect and surveyor to the School Board, and the whole work is being carried out under his direction, assisted by Mr. S. Jurd, the School Board clerk of works.

Church Restoration.—The Archbishop of Canterbury recently visited Rolvenden to dedicate the first part of the restoration of the interior of St. Mary's Church. The old pews have been removed from the chancel and the front portion of the nave and aisles, and in their place are newly carved pews. The old choir seats have also given way to carved stalls, and the two old chantry chapels have been divided from the chancel and nave by carved screens. The whole of the carving has been done in teak by the vicar, the Rev. H. Percival Smith. The work in connection with the alterations has been carried out by Mr. J. Wickens and Mr. D. Russell.

New Patents.

These patents are open to opposition until September 10th.

1900.—**Scaffold Fastenings.**—11,913. J. Fage, 121, Hertford Road, Kingsland, and J. Hunt, 86, Herbert Street, Hoxton, London, N. According to this invention each fixing may be made in one or two minutes. A metal bracket 2½in. wide by 9in. long is used, being provided with a length of chain which is drawn up tightly by screw bolts.

Door Holders.—14,016. E. P. Spence, Empress Chambers, Southampton Docks. The object of this invention is to enable a door to be held open or partly open. This is accomplished by a spring-actuated rod having a foot of india-rubber that presses on the ground. When it is desired to close the door, the rod with its pad is raised by a handle.

Portland Cement.—15,432. A. Gibb, Hunts Cross, near Liverpool. This invention relates to the production of Portland cement by fusion at a moderate temperature, at the same time preserving the qualities essential to its setting and hardening. Peroxide of iron is used in place of alumina. The necessity for intimate and uniform incorporation of the component materials is obviated and a large reduction in the fuel needed in manufacture is effected.

Concrete Walls and Partitions.—15,446. G. L. Mouchel, 38, Victoria Street, Westminster, S.W. This invention relates to concrete walls having curved metal bars embedded in them to take the main compressive strains set up by lateral or horizontal pressure, and straight bars to take the shearing strains. The wall may be built up of slabs.

Fireproof Floors.—15,453. L. Pitsch, Great Wanzleben, Germany. This invention relates to a fireproof floor with a flat or inclined soffit, the bays being supported at four sides by longitudinal joists and by cross joists; and consisting of grooved bricks embedded in concrete. No tie-bolts are used to counteract the thrust of the ceiling.

1901.—**Tennis and Other Courts.**—4,370. I. Etrich, Oberaltstadt, near Trautenau, Bohemia. A foundation of cinders or slag 4in. thick is first laid down: it is then tarred. Next thin viscous tar is put on in streaks, and on this roofing paper is laid with a lap of 4in. Finally a topping of tar is applied.

Radiators.—7,467. C. E. Safford, 301, Washington Street, Buffalo, U.S.A. The sections are made of flexible sheet metal, and are thus very light.

Decorating Woodwork.—10,406. H. Smith, 176, Edgevale Road, Kew. The wood surface is smoothed and treated with kerosene and varnish. Wetted wallpaper is then applied to it and the design transferred.

The following specifications were published on Saturday last, and are open to opposition until September 17th. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1900.—12,380, Lake (*MacCoy*), workmen's time recorders. 12,936, Solon & Tellwright, manufacture of glazed bricks and tiles. 12,964, Baker, conveyor apparatus. 12,993, Sprott, acetylene generators. 13,742, Bauer & Rumpler, feed mechanism for acetylene gas producers. 14,437, Roberts, T-squares. 14,503, Talbot, bricks for metallurgical furnaces. 14,919, Robertson & Robertson, water buckets for fire extinguishing purposes. 15,045, Clay & Ennis, incandescent gas burners. 15,895, Smith & Luke, roller blind pulleys. 16,077, Poetter, gas generators. 16,104, Whittaker, utilising sewage sludge as fuel blocks. 16,193, Brown, sliding window sashes arranged to open inwardly. 16,233, Metz, manufacture of tiles, slabs, panels, &c. 16,270, Haslam, domestic fireplaces. 16,430, Müller, hoisting apparatus for use in the erection and repair of chimneys. 16,665, Charles, lever cramp. 16,728, Harrington, refuse destructors. 17,103, Gibbs, sewer or drain scraper. 17,124, Lucy & Turtle, gauge or protractor for gauging, marking off, &c. 23,222, Thompson (firm of *Samuel Zielenziger*), incandescent gas lamps.

1901.—280, Heberer, pipe-wrenches. 5,597, Davis, chimneys and ventilators. 8,349, Schmidt, radiating tubes. 9,680, Schmidt, grindstones. 10,210, White, maps, plans, charts, &c. 10,256, Lewis, means for connecting together parts of slate mantelpieces. 10,272, Ballinger & Milligan, brackets for supporting gutters or spouting. 10,407, Parker, corner plates, strips or beads for plastered walls. 11,699, Coe, package rolls for facilitating the deposit of metallic leaf upon surfaces to be decorated. 11,765, Kresse, Venetian blinds. 12,014, Parsy, concrete floors.

Surveying and Sanitary Notes.

Blackpool Promenade is to be widened 100ft. The work will be commenced in October.

Duke of Beaufort's Monmouthshire Estates.—A further section of these was sold at Chepstow recently, when forty-four lots of freehold property were disposed of. The total obtained was nearly £15,000.

Cheap Land.—Nearly 13 acres of freehold land, together with a cottage and buildings, situated at Bramston Island, was recently sold at Lincoln for £180. This works out at about 1½d. a yard, while the cottage is practically given free.

A Victorian Memorial.—A public park established to commemorate the Victorian Diamond Jubilee and reign was opened at Tipton, Staffordshire, last week. The park is thirty-two acres in extent, and has cost £10,000, part of which was raised by public subscription. It has given considerable stimulus to building enterprise, and over a thousand dwellings are being erected on its environs.

Twentieth-Century Drainage Systems.—At Eastbourne last week Mr. Isaac Shone, of Westminster, read a paper before the Royal Institute of Public Health on "The House and Town Drainage Systems of the Twentieth Century." Mr. Shone claimed that the drain and sewer ventilation problems, which had hitherto been considered and treated apparently by the highest engineering authorities as if they were and would continue to be insoluble, had been solved by his automatic hydro-pneumatic sectional system of town drainage. He dealt in detail with what he described as a practically perfect system of drainage in connection with all future work. A long discussion took place on the question of the ventilation of sewers.

A Great New Ground Plan of London.—Considerable progress has been made with a great ground plan of London showing the various ownerships. The work has been in hand for more than five years, and deals with the proprietorship of ninety-two square miles of the metropolitan area, representing 5,712 freeholders, and only twenty-six square miles now remain to be mapped out. The committee in charge of the work has met with several refusals to supply particulars, but the information has been obtained automatically from other sources, and now only 150 refusals have yet to be treated. Up to the present the committee has expended £3,705 upon the work, in addition to which there has been a further expenditure of about £135 in preparing an annual map showing the progress of building operations from year to year.

A London Crematorium.—The sanitary committee of the corporation recently requested the City engineer (Mr. D. I. Ross) to prepare sketch drawings of a suitable crematorium with two furnaces for erection at Ilford. The plan provides for a chapel, having an entrance porch and one catafalque. The furnace flue will be arranged in the centre of the tower, which will form a feature in the buildings and will be about 80ft. in height, a small auxiliary furnace at the base of the tower being provided for the more perfect consumption of gases arising from the cremating furnace. The crypt, or columbarium, under the chapel will be fitted up for the reception of the urns. The estimated cost is about £10,500.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Directory of Architects.

SOUTH KENSINGTON.—L. G. A. J. writes: "Is there a directory of architects published similar to the one issued by the 'Engineer'?"

"Specification" (published at these offices, price 5s. nett) gives a list of metropolitan architects. The names and addresses of provincial architects may be obtained from Kelly's "Directory of the Building Trades," and from the R.I.B.A. Kalendar and Society of Architects' "List of Members."

English Houses in Belgium.

LONDON, E.C.—A. B. K. writes: "A friend of mine in Belgium is anxious to build some small houses in the English style, such as we should call semi-detached villa residences, with a good patch of garden to each. Have any plans and elevations of these been published in back numbers of your journal? Of course it would be necessary for him to employ an architect, but the published plans might give him some general idea of the various styles."

We presume our correspondent means that a Belgian architect will be employed, and wants some designs for him to copy. Such an arrangement would, we fear, hardly prove successful, and it would be better either to let the Belgian architect build in his own style or obtain designs from an English architect. Scores of designs for small houses have been published in back numbers of this journal. We might, however, mention as examples the designs by Messrs. Bateman & Bateman in our issues for February 14th and March 14th, 1900; those of Mr. E. Guy Dawber in our issue for April 3rd, 1901; and those of Mr. Arthur T. Bolton in our issue for April 17th, 1901. An illustrated article on "Small Gardens" appeared in our issue for March 13th last.

Registration of Architects.

GREAT MALVERN.—A. T. G. writes: "I send a cutting from a local paper. It would be interesting to know which of the five firms advertising therein would be entitled to register themselves as 'architects' under the provisions of the suggested registration Bill for architects."

The cutting in question relates to persons calling themselves "auctioneers and estate agents, surveyors and architects," &c., who are willing to prepare plans, reports and valuations, and to undertake sales. We have already answered numerous queries relating to the registration of architects (see back numbers of Vol. 12). By section 1, clause 19, of the Bill anyone actually practising architecture prior to January 1st, 1899, or "who has served as apprentice, assistant or practitioner in architecture, all or either, for seven years in the aggregate, after having attained the age of fifteen years prior to the passing of this Act," will be entitled to be registered. If the five firms in question conform to these requirements they could be registered. At the time the roll is first made good and bad must inevitably be included.

Sketching in the French Cathedrals.

BECKENHAM.—C. J. B. writes: "Which is the best way to obtain permission to look over French cathedrals for the purpose of sketching and study? I intend visiting Paris, Amiens, Beauvais, Rheims, Chartres, and perhaps Laon and Noyon. I shall cycle part of the way, and take the train occasionally to save time."

I believe that, technically, the right to grant permission to sketch in the historic buildings of France, including the cathedrals, is vested in the Ministre des Cultes, but personally I have found it sufficient to write locally (in French), using foreign reply post-cards. A courteous reply is invariable, either granting the desired permission or stating how it is to be obtained. Without being absolutely sure, I think the persons to address are "Monseigneur l'Archevéque" at Paris and Rheims, "Monseigneur l'Evêque" at Amiens and Chartres, "Monsieur le Curé de la Cathédrale" at Beauvais and Noyon, and "Monsieur le Curé de l'Eglise de Notre Dame" at Laon. The great church at Laon is under restoration, so that "Mons. l'Architecte de la Restauration" should also be written to, as should also "Mons. le Maire," under whose charge is the museum and the Templars' Church. Laon is a small town containing a good deal of old work, some of it hidden away in courtyards, and should certainly not be missed. It would be advisable before starting to obtain one of the R.I.B.A. travelling cards, as they are sometimes of considerable use, especially in out-of-the-way places.

G. A. T. M.

Rings for Bracing Rods.

LONDON, E.C.—V. W. writes: "In putting round-section wrought-iron diagonal bracings between iron columns, with rings of flat bar wrought-iron at the point where the bracing rods would otherwise cross, how can I calculate the width and thickness of the metal of the ring so as to make it not only of equal strength with the bracing rods but strong enough also to resist deformation? The deformation will of course depend partly on the diameter of the ring, and the strength of the rods must be taken at their effective diameter nett after cutting for screwing on nuts."

Suitable proportions for the junction rings of diagonal bracing in pier work would be as shown by the accompanying sketch, the diameter of the screwed ends being the unit, whether the rods have plus or minus threads.

HENRY ADAMS.

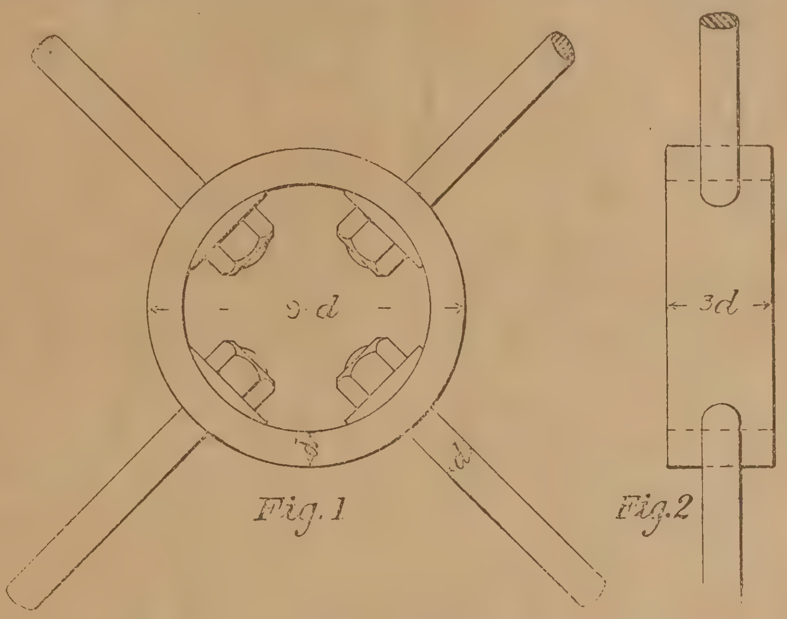


Fig. 1 Fig. 2

RINGS FOR BRACING RODS.

Damp Walls.

SUNDERLAND.—DAMP WALL writes: "We have work in hand which includes the repair of the interior wall of a small chapel which is very damp. Various remedies have been tried without effect. As the chapel is in a seaport town we think that salt sand may have been used and that this is the cause of the trouble. Kindly give your opinion. The wall in question is a hollow 14in. one, in two leaves of 4½in. and a 5in. cavity. It is plastered on the inside, and a flue runs up the centre. Would a couple of windows in the gable form any improvement?"

In all probability the dampness is due to the use of either salt sand or salt water, and if so the wall will have to come down. This would be cheaper in the end than to continue trying ineffectual remedies. If the moisture were on the surface only and due to condensation, that being due to insufficient ventilation, the proposed windows might effect a cure, but this hardly seems to be the case. To sacrifice a little more space and build up another 4½in. leaf inside the wall would be more likely to succeed.

G. A. T. M.

Action of Lime on Iron.

LONDON.—F. C. E. writes: "What is the action of ordinary lime mortar when in contact with structural steelwork (say, when brick in lime mortar is bonded into the steel stanchions of the steel framing now so generally used); and is cement-mortar or fireclay better for the steel? A certain amount of moisture is bound in most cases to find its way through the clothing of brickwork."

The corrosion of iron in its several varieties appears to depend chiefly upon the amount of moisture which reaches it in the presence of air. The comparative liability to oxidation of iron in moist air, according to Mallet, is cast-iron 100, wrought-iron 129, steel 133. Cast-iron rusts with comparative slowness, and the rust is generally in a state of fine division. In the writer's experience mild steel rusts very much like cast-iron, while wrought-iron rusts more rapidly and comes away in large flakes and slabs sometimes exceeding a sq. ft. in area and ¼in. thick. The thickness of a slab of rust does not represent the thickness lost by the original plate, as it is greatly augmented by the oxygen and moisture which have entered into combination with the iron. Chemically the rust is a "hydrated sesquioxide of iron." Lime does not enter into direct combination with iron, but it may be the medium for conveying air and moisture to it; hence iron in contact with damp brickwork in mortar rusts readily, although the Sheffield grinders use lime-water in which to dip their bright articles to prevent them from rusting. Portland cement wash is a protector of iron from rust, and brickwork in cement would permit less moisture to reach structural ironwork than brickwork in mortar, and is therefore to be preferred. In the writer's new pamphlet on designing built-up steel stanchions a quotation from an American work says: "For exterior walls nothing has been found to so perfectly protect the steel embedded in them as first-class hard-burned brick laid in cement-mortar, and this is also the best protection against corrosion."

HENRY ADAMS.

Acquiring a Knowledge of Architectural Detail.

LONDON, W.C.—CONSTANT READER writes: "Having served my articles for three years in a London office and found it of no practical use, would you kindly suggest the most expeditious and best method of acquiring a working knowledge of details? I find the Association expensive."

To acquire a knowledge of architectural detail there is nothing to compare with the conscientious study of old buildings, making measured drawings to scale on the spot. It is necessarily expensive, as it involves a good deal of travelling, unless the student happens to have friends in architecturally good localities; and it takes up a great deal of time. To obtain the greatest possible benefit from such work, two or more students should club together, and they should have an older and more experienced man with them for at least part of the time. If by detail, however, structural detail is referred to, the best course to adopt is to act, for a year or so as clerk of works upon some building which is not of too simple a description—if any architect can be found who would trust so young a student with so responsible a position. Other methods of acquiring the desired knowledge may be more expeditious, but none are better than those above mentioned. G. A. T. M.

Strength of Iron and Steel.

London, W.—Roof writes: "Can you tell me the S.W. and B.W. of wrought-iron (in rods, struts, &c.), say, per square inch sectional area for tensional, compressional and sheering stresses?"

The strength of wrought-iron, mild and cast steel, and cast-iron for structural work is given in tons per sq. in. by the following table:—

	Breaking Strain.	Safe Load.
	Tons.	Tons.
Wrought-Iron:		
Tension - - -	22	5
Compression - -	18	4
Shearing - - -	20	4
Mild Steel:		
Tension - - -	30	7½
Compression - -	25	6
Shearing - - -	25	5
Cast Steel:		
Tension - - -	35	8
Compression - -	50	12
Cast-Iron:		
Tension - - -	7	1½
Compression - -	42	7½
Shearing - - -	14	2½

The tensile strength assumes sound welding and proper proportioning of eyes, &c. The compressive strength assumes that the specimen is so short as to be unable to bend; the actual allowance must be proportioned by Gordon's formula, the figures given being the value of *f* in the formula. The shearing strength assumes that the parts causing the shear stress are so close to each other that no transverse stress by leverage is caused at the same time. An indifferent weld may cause the loss of 25 per cent. of strength, and for this reason 5 tons per sq. in. is the maximum tension that should be put on a wrought-iron rod; some authorities limit it even to 4 tons per sq. in., while others, assuming sound welds, allow as much as 7½ tons per sq. in. for roof-work in wrought-iron.

HENRY ADAMS.

Glaze on Tiles.

London, E.C.—W. R. & Co. write: "One of our correspondents in China, who is a regular subscriber to your journal, has written asking whether we know of any glaze that can be applied dissolved on a cement floor tile—one which is transparent and will stand hot and cold water. Our correspondents are makers of floor tiles of cement and sand which are not glazed, but are either of one or more colours on one plate of about 8in. square, and it appears that for wainscotting or fireplaces these tiles are preferred glazed."

Detailed particulars respecting various recipes for "frits" and glazes suitable for dipping porcelain, ceramic, and other ware will be found in "Workshop Receipts," edited by Ernest Spon and published by E. & F. N. Spon, Ltd., 125, Strand, London, price 5s. T. E. C.

Connections with Town Sewers.

Eccles—O. E. writes: "A. recently purchased the house and land edged red on enclosed plan (not reproduced) and desires to take down the present buildings and erect about twenty cottages on the ground, including the formation of a new street running from east to west from B.'s gateway. There is no connection from A.'s land to the town sewer; the occupant of the house, &c., uses all sewerage upon the land. The council have recently constructed a deep sewer south of this land, but B.'s land intervenes, and he is unwilling to grant an easement to A. The borough engineer demands that being within 100yds. of the town sewer A. must connect his drains therewith, stipulating for a 12in. sewer. Is not the town council responsible to provide a suitable outfall for A. free of cost?"

The town council have apparently done all that may reasonably be expected as regards the provision of public sewers. A. should endeavour to come to terms with B. so that he may connect with the public sewer. Perhaps A. might purchase a strip of land from B., and thus solve the difficulty. T. E. C.

Masters and Men.

The Builders' Labourers' Strike at West Hartlepool.—On July 29th the West Hartlepool magistrates were occupied the whole afternoon in hearing cases of alleged intimidation of workmen, the outcome of the builders' labourers' strike, which has now lasted twelve or thirteen weeks. John Duffy, Anthony Hanlon and Matthew Scanlon were committed for trial.

Masons' Strike at Llandudno.—A strike of masons engaged at the Grand Hotel, the Forester's Convalescent Home, and other places at Llandudno has resulted in a total stoppage of work. The "banker" masons object to their work being undertaken by "wallers." The quarrel has nothing to do with the master-builders, who look helplessly on this civil war in the rank of their employees. About 250 men are affected.

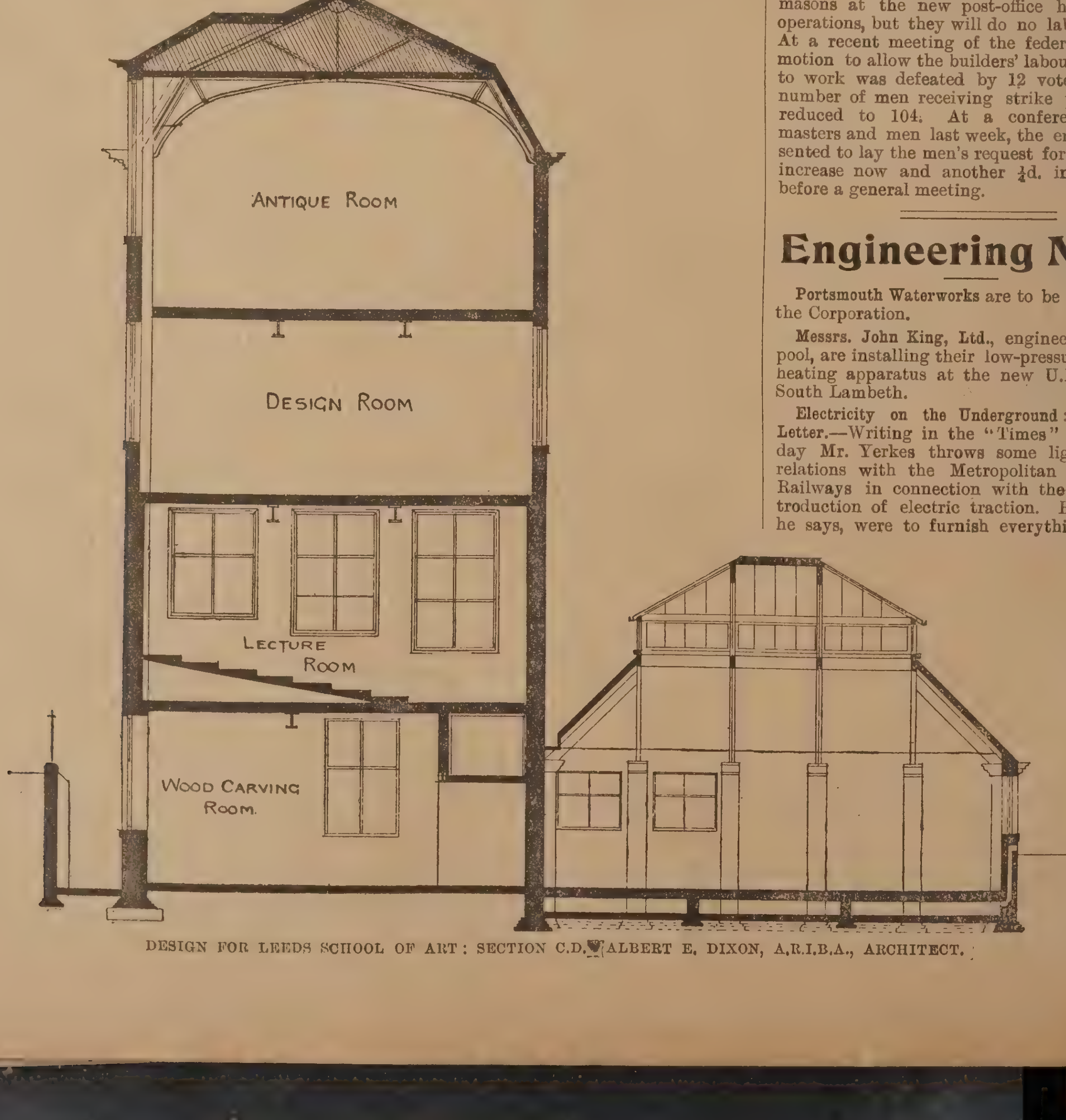
Swansea Builders' Labourers Still Out.—The Swansea builders' labourers have now been out on strike just over three months. Apparently there is little change in the position, except that there is a growing feeling of dissatisfaction among members of the federated trades, notably the joiners, who have been in enforced idleness since the second week of the strike. All, however, are well supported by their unions. The masons at the new post-office have resumed operations, but they will do no labourers' work. At a recent meeting of the federated trades a motion to allow the builders' labourers to return to work was defeated by 12 votes to 6. The number of men receiving strike pay has been reduced to 104. At a conference between masters and men last week, the employers consented to lay the men's request for ¼d. per hour increase now and another ¼d. in six months before a general meeting.

Engineering Notes.

Portsmouth Waterworks are to be purchased by the Corporation.

Messrs. John King, Ltd., engineers, of Liverpool, are installing their low-pressure hot water heating apparatus at the new U.M.F. Church, South Lambeth.

Electricity on the Underground: Mr. Yerkes' Letter.—Writing in the "Times" last Wednesday Mr. Yerkes throws some light upon his relations with the Metropolitan and District Railways in connection with the proposed introduction of electric traction. His proposals, he says, were to furnish everything necessary



DESIGN FOR LEEDS SCHOOL OF ART: SECTION C.D. ALBERT E. DIXON, A.R.I.B.A., ARCHITECT.

to change and operate their road by electricity, charging the sum of three farthings for each passenger they might carry; also guaranteeing a nett yearly revenue sufficient to pay the whole of its debenture and other fixed charges, and its guaranteed and preference interest. That tender having been rejected, Mr. Yerkes says it is the desire of the managers of the Metropolitan District Electric Traction Company to proceed to carry into effect at the earliest possible moment the electrification of the District Railway.

THE FUTURE OF ARCHITECTURAL CERAMICS.

IT would be childish to seek to hide (says a writer in "La Ceramique") that the employment of ceramics in architecture is making no progress. On the contrary, its application has for years past become less and less.

In the International Exhibitions of 1878 and 1889 ceramics entered in a certain measure into the construction of the buildings, the outcome of which in each instance was an enthusiasm for the polychromatic decoration of buildings, but which, it must be kept in mind, did not extend beyond a somewhat limited circle. This, however, was sufficient to give a rather artificial life to the manufacture of architectural ceramics. In the 1900 Exhibition, apart from the stoneware frieze from Sevres, which was a triumph for our national pottery, ceramics shone by their absence in the Exhibition Palace and were replaced by coloured plaster.

We might easily console ourselves for this absence if ceramics found any compensation in private buildings, but there is no such luck; and, apart from certain green glazed bricks which are at present in vogue, ceramics are more and more neglected by the architect.

In the provinces, with the exception of those districts where the absence of stone compels the use of brick, ceramic ornamentation makes no progress. The consumption of plain or moulded bricks and tiles is continually on the increase, but, apart from a few villas in the Renaissance or Moorish style, the conspicuous use of ceramics does not thrive, and it remains almost everywhere excluded from public buildings.

Do not let us imagine that this stagnation is confined to France. We do not know the exact position of affairs in all civilised countries: there may be a few exceptions, although we have never heard them mentioned; but this one thing is certain, that in the country where the manufacture of modelled bricks has been pushed most—in Germany—there has been for years past a marked falling off in the use of these bricks.

This unfortunate state of affairs has already preoccupied certain individuals who, by reason of their position, are better informed than the general public. It is the result of this preoccupation that has led M. Metz, chairman of the French Ceramic and Lime-burners' Union, to promote a competition amongst architects, giving a rather handsome prize for the best scheme of entirely ceramic construction. By this initiative the chairman of the Union hopes to attract the attention of architects to ceramic decoration.

We trust that the effort of M. Metz and the ceramists associated with him may be crowned with success, but we cannot avoid being a little sceptical. Frankly, it is a mistake to think that the entire blame for the present state of things is due to the architect. Doubtless the official teaching of the art school is decidedly disdainful with respect to ceramics, and it is against that tendency that the competition in question will fight, and fight successfully we hope. But there are other reasons for the present situation. We believe that the discovery and examination of these causes will elucidate the question, and put us, maybe, on the track of other remedies.

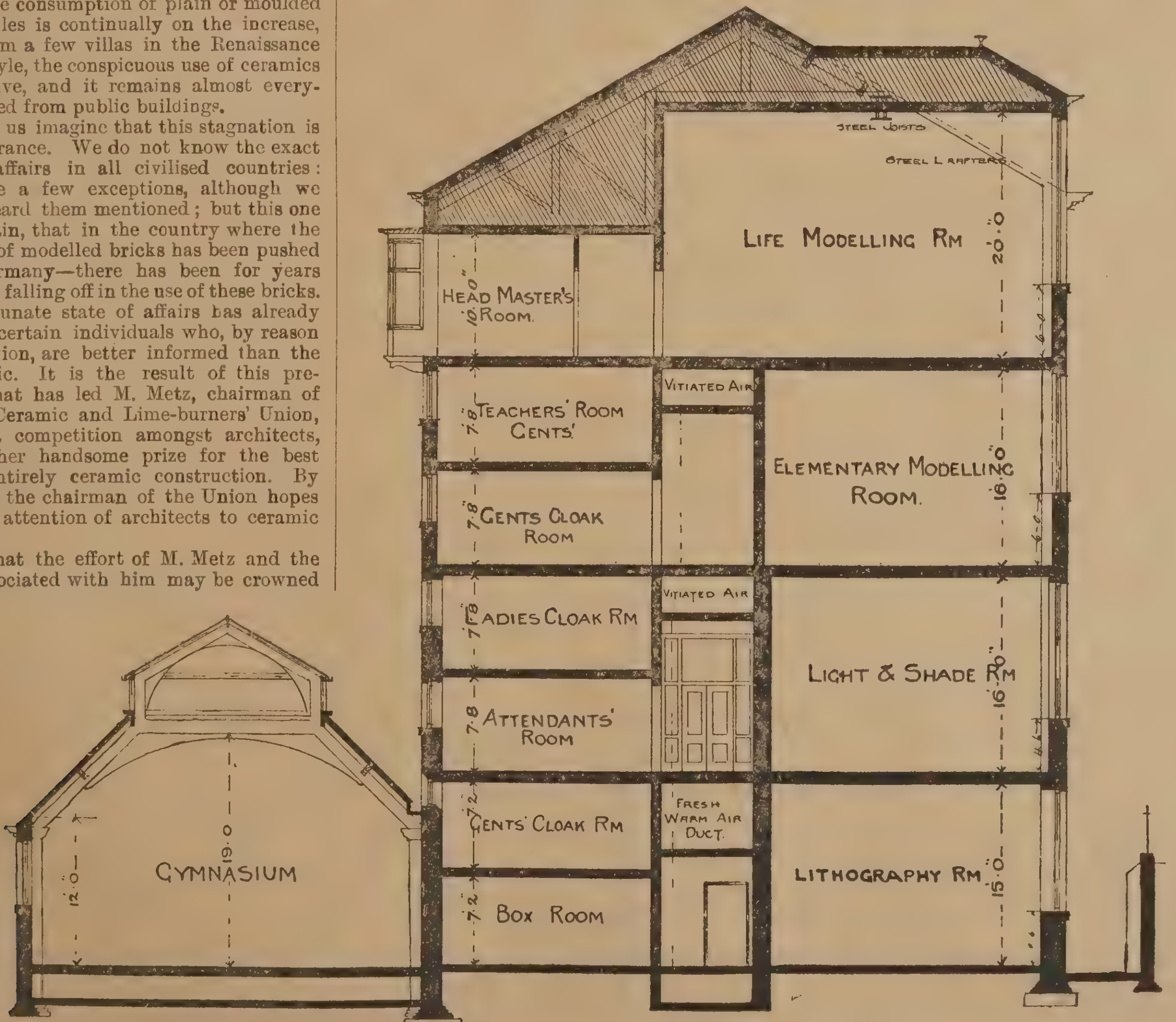
First of all, from the architect's point of view, it is certain that the employment of ceramic decoration offers less facilities than stone or cement fronts. As a matter of fact, before commencing a building it is necessary that all its ornamental details shall be definitely settled, if they are to be carried out in ceramics. On the contrary, with stone, carved on the job, the ornamentation is not commenced till the bulk of the work is finished. The architect's task is simplified, and he finds it possible to judge on the spot the effect of mouldings and ornament, instead of being obliged to decide irrevocably upon them on paper in his office.

It will undoubtedly be very difficult to remove an inconvenience which has already turned many architects against the use of ceramic materials. The clayworkers, in our opinion, started on a wrong track, when they plunged into polychromatic decoration, in adopting startling colours and brilliant enamels. They have been seduced by the architecture of the Moors and the Persians, whose work was destined to be seen in clear sunshine. Furthermore, the taste of the present day inclines to half-tones, and the juxtaposition of slightly differing colours is preferred to violent contrasts. The vitreous glitter of enamels gives a fanciful character which may be suitable for some buildings, but which is disturbing where the style ought to be of a more elevated order. We cannot believe that with the present red, yellow or black terracottas, or the glassy green or blue faïence, we shall ever succeed in bringing about a serious adoption of polychromatic decoration. It therefore behoves clayworkers to themselves seek and find the remedy, and to place in the hands of the architect products more conformable to the artistic aspirations of our times. In this order of ideas, the new Sevres fresco points out one suitable line to take up.

Regarding ornamental bricks more especially, it is certain that their restricted use is due in part to their too deep colour, but we may further observe that many of these bricks are too porous, and their original tint is modified and turned to grey in consequence of the dust which penetrates their pores and which can never again be removed. The two foregoing reproaches do not apply to ornamental bricks of German manufacture, which, after being in favour for twenty years, are now more and more neglected. We think we may seek the reason of this abandonment in another defect of ornamental terra-cotta bricks, the small uniform dimensions of the bricks, and the necessity for a large number of joints.

The small dimensions of terra-cotta employed in building is one of the reasons of its preference over stone in a number of cases, but this advantage often becomes a fault when we are concerned with the facades. The little chequering may suit unimportant buildings, but appears out of scale when it concerns large buildings. It is quite sufficient to see in Germany certain streets entirely constructed in ornamental bricks all of the same size to understand that it is the monotony, the dead uniformity and the desire of seeing plain surfaces more reposeful to the eye which is the cause of the abandonment we speak of.

Such are the principal criticisms we have to pass upon the use of terra-cotta bricks or blocks in matching patterns. It will be noted that they are addressed, at all events, as much to clayworkers as to architects, and that it will only be by the efforts of all concerned that we shall succeed in making ceramic products take their due position amongst decorative and constructive materials.



DESIGN FOR LEEDS SCHOOL OF ART: SECTION A.B. ALBERT E. DIXON, A.R.I.B.A., ARCHITECT.

Bricks and Mortar.

APHORISM FOR THE WEEK.

Better far
Pursue a frivolous trade by serious means,
Than a sublime art frivolously.
MRS. BROWNING.

Our Plates. IN a recent limited competition the design for Leeds School of Art by Mr. Albert E. Dixon, A.R.I.B.A., 5, Park Lane, Leeds, was placed second by the assessor, Mr. Bidlake, of Birmingham. In designing a school of art the lighting of the different classrooms is a very important matter. A north light is considered the best, but if this is not obtainable an east light would be the next best. Special attention has to be given to the life-rooms, the antique, painting, light and shade rooms; all cross-lighting being avoided by the use of very large windows on one side only. The rooms should also be lofty, especially those used for drawing from the antique and the life. Where more than one window is required in these rooms, screens would be necessary to prevent cross-lights. It was proposed to carry out the design in red-pressed brick, with stone and red rubber brick dressings, Westmorland slate roofs, fireproof corridors, &c. Steel joists appear to be a necessity for the window heads. The estimated cost was £9,000, not including the gymnasium. This necessitated elevations of a plain and simple character.

Michael Angelo's House. LITTLE by little, as in all other modern cities, Rome is changing, and precious landmarks are disappearing, in many cases against the will of the inhabitants. At present it is the house of Michael Angelo which is in question. The monument to Victor Emmanuel is now proceeding apace, and with it the consequent widening of the Corso, and in the way of this stands the historic house. The last twenty years—and among the most interesting—of the illustrious artist were spent here, as it was during that period that his charming friendship with the poetess Vittoria Colonna took place; it was here he wrote the sonnets whose inspiration she was, and here that he made his last designs. On a cold day in February, 1561, he died an old man, and was taken to the Church of the SS. Apostoli, not far off, which stands next the Colonna Palace. In the church is still to be seen the statue of Michael Angelo on the tomb where it was intended to lay him. Modern criticism declares that it was not intended for him, but the features certainly answer to what we know, even to the nose broken by Torrigiano, before he went to pursue his heated career in England. The house was for long reverenced for its associations, but was eventually lost sight of, and only unearthed, so to speak, in 1866, to be later marked by a commemorative tablet. It is a pity that so authentic a relic should disappear.

"Art Nouveau" Furniture. A SHORT time ago, Mr. John Belcher, Mr. Reginald Blomfield, Mr. Mervin Macartney and Mr. Edward S. Prior protested in the "Times" against the South Kensington authorities for having introduced into the Museum specimens of the work styled "l'Art Nouveau." "This work," they argue, "is neither right in principle nor does it evince a proper regard for the material employed. As cabinetmaker's work it is badly executed. It represents only a trick of design which, developed from debased forms, has prejudicially affected the designs of furniture and buildings in neighbouring countries. In its present position it is in danger of being looked upon as a recognised model which has received the approval of the authorities for study by students and designers, and the harm it may thus produce on our national art cannot be easily gauged." The writer of the "Art Notes" in the "Morning Leader" does not, however, accept this view. He asks: "Is nothing to be exhibited in the Museum at South Kensington but what may be studied and emulated by students as a model of good taste? Are all works of merely historical interest to be excluded? If so, not a few objects, old and new, will have to be weeded out, along with those 'specimens of the work styled "l'Art Nouveau,"' about which the signatories to the letter are so vastly exercised. But there is another point—namely, is not their letter, in one respect at least, somewhat misleading? The mere outsider knowing nothing of the mysteries of art will run away with the notion that this objectionable innovation is an epidemic of Gallic origin, which, after having gradually insinuated its baneful influence into all the capitals of Europe, is now making its way into this country to infect the art of England. But is not the exact contrary, as a matter of fact, much nearer the truth? . . . .

A Sidelight from Italy. "HAD the signatories to the letter in question been recently at Bologna they might have discovered a school of design which has lately sprung up there, and is flourishing exceedingly, thanks to the liberality of a local patron. The vast Gothic church of San Francesco, long a military magazine, is in the course of being redecorated by this new school, and anyone who will take the trouble of looking at it will see at a glance that their art is only a vigorous Italian phase of 'l'Art Nouveau.' It is true that their wares are submitted to the public under the title of 'l'Arte Emilia'; but at a certain factory where many of their designs are employed I know as a fact that this particular way of designing is frankly called 'stilo Inglese,' and the great source of its inspiration unblushingly confessed to be the 'Studio Magazine.' . . . If, however, we are to probe the epidemic to its origin, we must go back to the early exhibitions of the 'Arts and Crafts,' of which society the four signatories of the letter in question were already members in 1890, if not earlier. At the exhibitions of the 'Arts and Crafts' was first publicly enunciated the grand principle underlying 'l'Art Nouveau,' namely, that all sorts of artistic problems which hitherto had been held to depend on architectonical principles and difficult considerations of form, proportion, propriety, or what not, were really capable of a most easy solution in the simple application of the 'pattern.' . . . . In this grand principle coupled with the formula of the 'swirl and a blob' lie all the mysteries of 'l'Art Nouveau.' . . . ."

"Pattern" Architecture. "A YOUNG designer at Munich, and an exhibitor at the 'Arts and Crafts,' was the first, I believe, to solve the difficult problems of architecture by the application of the 'pattern'; and there is a house at Munich by him whose street-front is one vast 'swirl and a blob.' In course of time the 'pattern' was naturally applied to furniture, with the result that all recognised forms and methods of construction were cast aside as obsolete; and thus were produced those specimens of the work styled 'l'Art Nouveau,' against which the signatories of the letter write to protest. Well, I am bound to agree with them that these specimens are 'neither right in principle, nor do they evince a proper regard for the material employed.' On the other hand, the best Parisian work of the kind possesses an 'esprit' and 'allure' which its English original was far from possessing. Much of the work exhibited at the 'Arts and Crafts' was equally wrong in taste and infinitely duller."

About Lincoln's Inn Fields. OF all the districts affected by the Holborn-Strand improvement, which has moved with giant's strides during the past few months, no one corner is so rich in memories as Lincoln's Inn Fields. Inigo Jones, by royal command, drew out a ground plan for the improvement of the Fields. It has often been stated that he reduced them to the exact proportions of the Great Pyramid, but this is not so, for, as many modern writers have pointed out, the square only contains 12 acres, while the Pyramid occupies 13½ acres. The square finished, Inigo turned his attention to the buildings which were to surround it, but, unfortunately, he only lived to carry out the west side, or, as it was at first called, the Arch Row. The laying-out of the Fields into walks does not seem to have had the immediate result of reducing the number of vagabonds who haunted them, and a new terror in the shape of the enterprising builder appear to have been imported. In Cromwell's time th building epidemic so seriously threatened th Fields that, upon receiving a petition settin forth that "divers persons have prepared ver great store of bricks for erecting buildings o the said square," the Lord Protector ordere that there should be a stay of all further building on the threatened ground. It would be im possible to enumerate here all the great men an women who from time to time have lived i Lincoln's Inn Fields. The famous Duchess o Marlborough, Lord Chancellor Cowper, Lor Chancellor Harcourt, William Pitt and the Ear of Lindsay are but a few. For Robert Bertie Earl of Lindsay, who was general of James I.' army, Inigo Jones designed the fine Ionic hous in the centre of Arch Row. This may still b seen, altered but little from its original appearance; it is now known as Nos. 59 and 60. Th house which adjoins it on the southern side i particularly dear to the heart of every lover o Dickens, for it was the scene of a memorabl event in the novelist's life, and it also figure prominently in "Bleak House." Both thes houses will share the common fate of demolitio when work is begun on the great new street.

Modern British Sculptors. SPEAKING of the Memorial the "Daily Chronicle" says "Mr. Brock is seldom inspired in his work, and he has now to prove whether in his colossal statue of the Queen he can retain the qualities that made the bust in this year' Academy seem so promising. But if Mr. Brock cannot carry through the scheme, there is probably no one but Mr. Gilbert who could. Mr. Onslow Ford's monument for Manchester, shown in the Academy, is anything but a success; Mr. Frampton's, now at Glasgow, has even less of dignity. Among the younger men, to whom could one turn? The young Scotch sculptor who modelled the statue of King Edward VII. —the first raised anywhere in his honour— standing under the dome of the Industrial Hall in the Glasgow Exhibition does not rouse much confidence in untried genius. If the artists do not exist, it makes small difference whether or no there is a minister of fine art or a society for its encouragement to make opportunities for them."

Dr. Peters in Zambesia. FOR the last two years Dr. Carl Peters has been exploring the country between Zambesi and Sabi, and he has been able to ascertain that all the ancient ruins along the eastern border of Mashonaland apparently belong to the same class of civilisation. Along the banks of the Mazoe and Ruenya, on the high plateaux of Inyanga and Melsetter, in Manicaland, and in the neighbourhood of the Sabi river, he has everywhere found the same type of ruins. Over the whole district the cyclopean wall is the typical form of house-building, and in some parts whole cities of these buildings are lying open to the eye of the astonished explorer. During his last expedition he had a chance to get access to some newly-discovered bushmen-paintings, which are in form and in colour of an absolutely Egyptian character. It is also known that etymologists have found in the Hottentot language traces of the ancient Egyptian. These all are very remarkable facts, which seem to contradict the Semitic-Sabæan theory of ancient South African civilisation. Dr. Peters has now brought home with him a female figure 4¾in. long which is undoubtedly Egyptian. He considers it to be about 5,000 years old and a representation of the goddess Isis. It proves direct Egyptian influence in South Africa.

The Sculptor James Vibert is hard at work on a statue to the memory of Eugène Manuel, the poet. When finished it will be erected at Passy, where the author of the "Ouvriers" resided for a long time.

The Fortifications of Paris: Site to be Sold for Building Purposes.—The Paris municipality having been unable to agree with the State for the purchase of the site of the fortifications, the State is now likely to sell it by instalments for building land, the municipality undertaking the expense of roads. Thus vanishes the scheme of a belt of parks round Paris.

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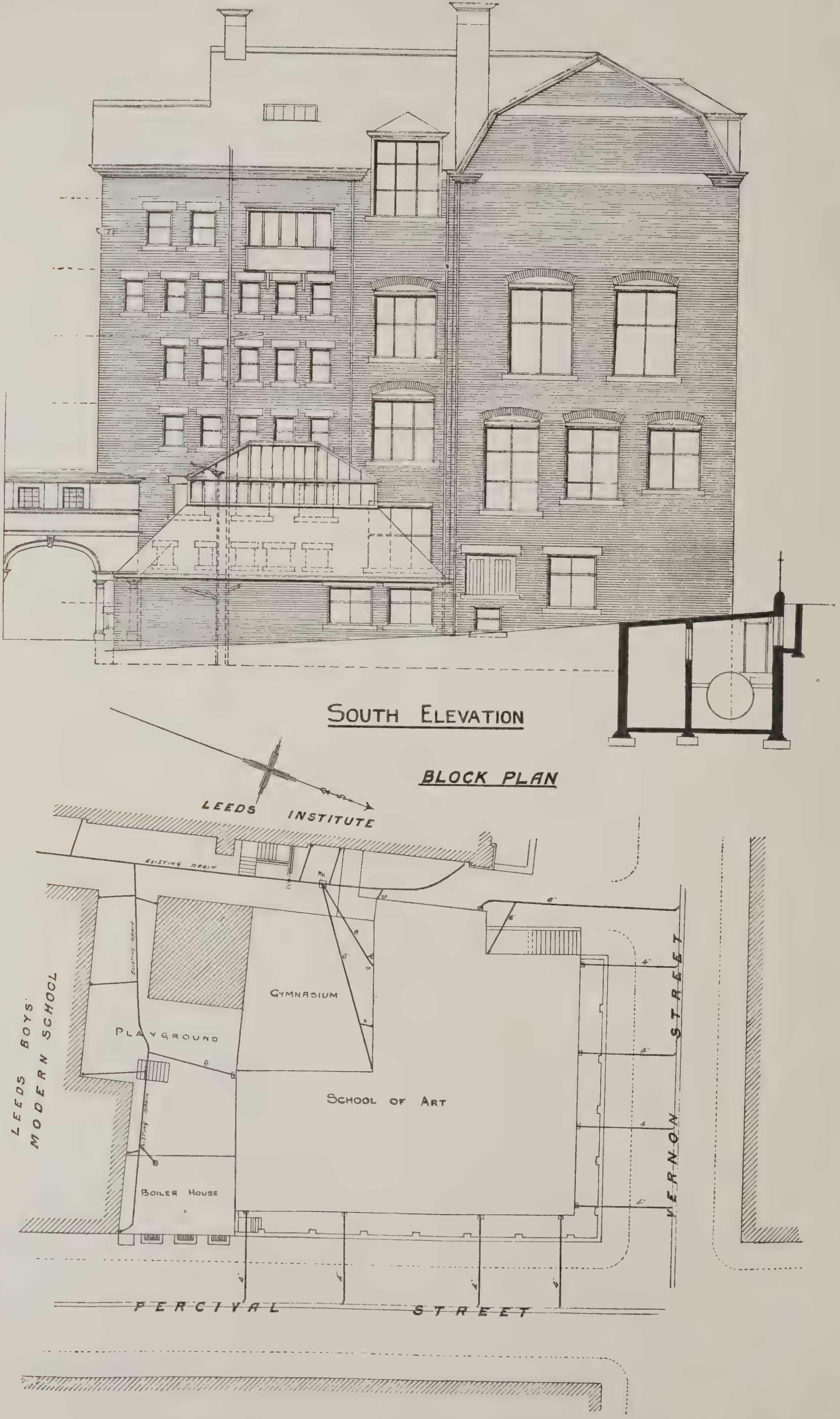

DESIGN FOR LEEDS SCHOOL OF ART.

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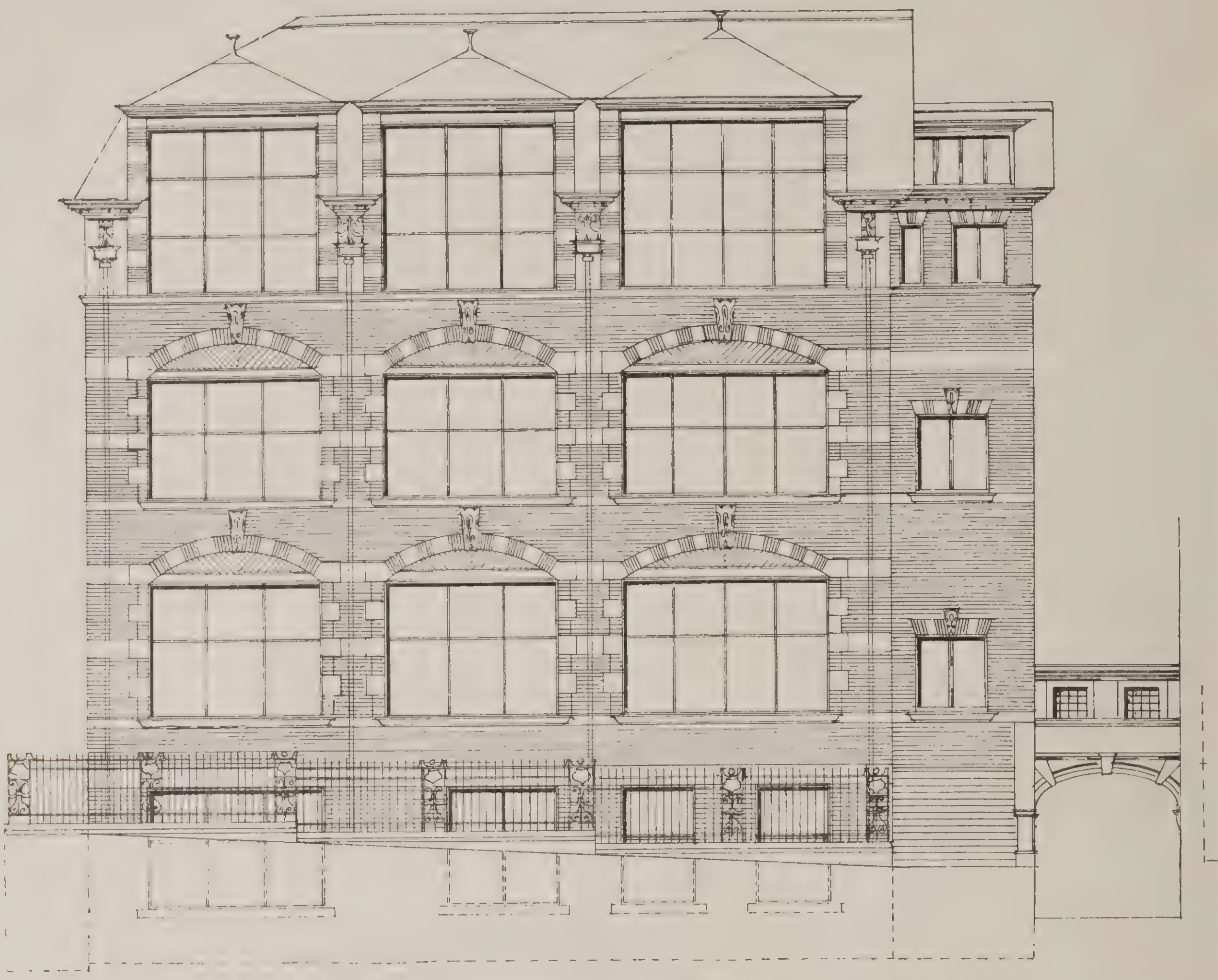
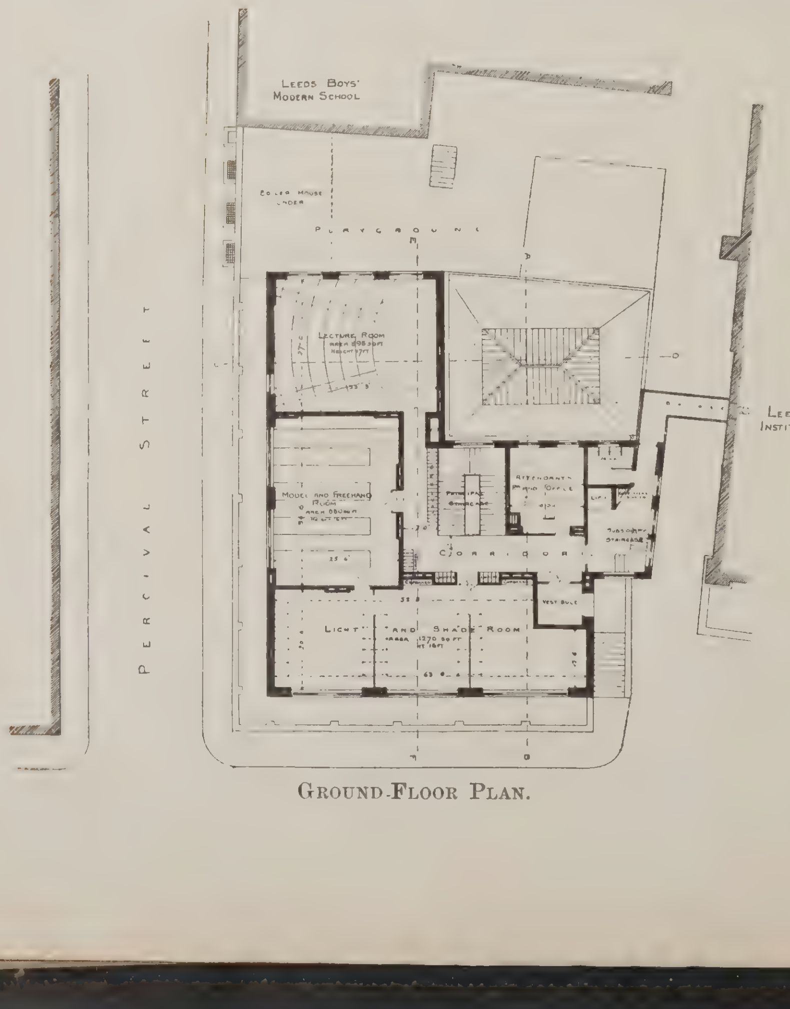
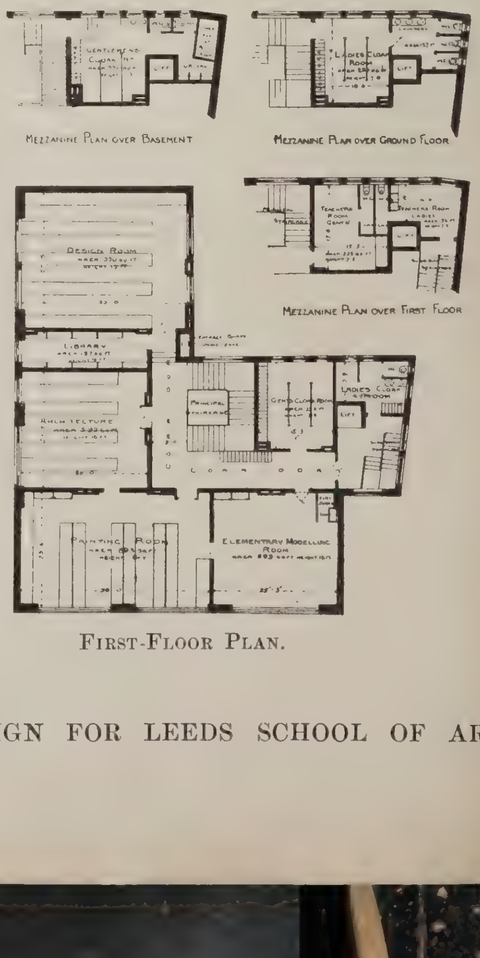


Elevation to Vernon Street.



Ground-Floor Plan.



Mezzanine Plan over Basement

Mezzanine Plan over Ground Floor

Mezzanine Plan over First Floor

First-Floor Plan.

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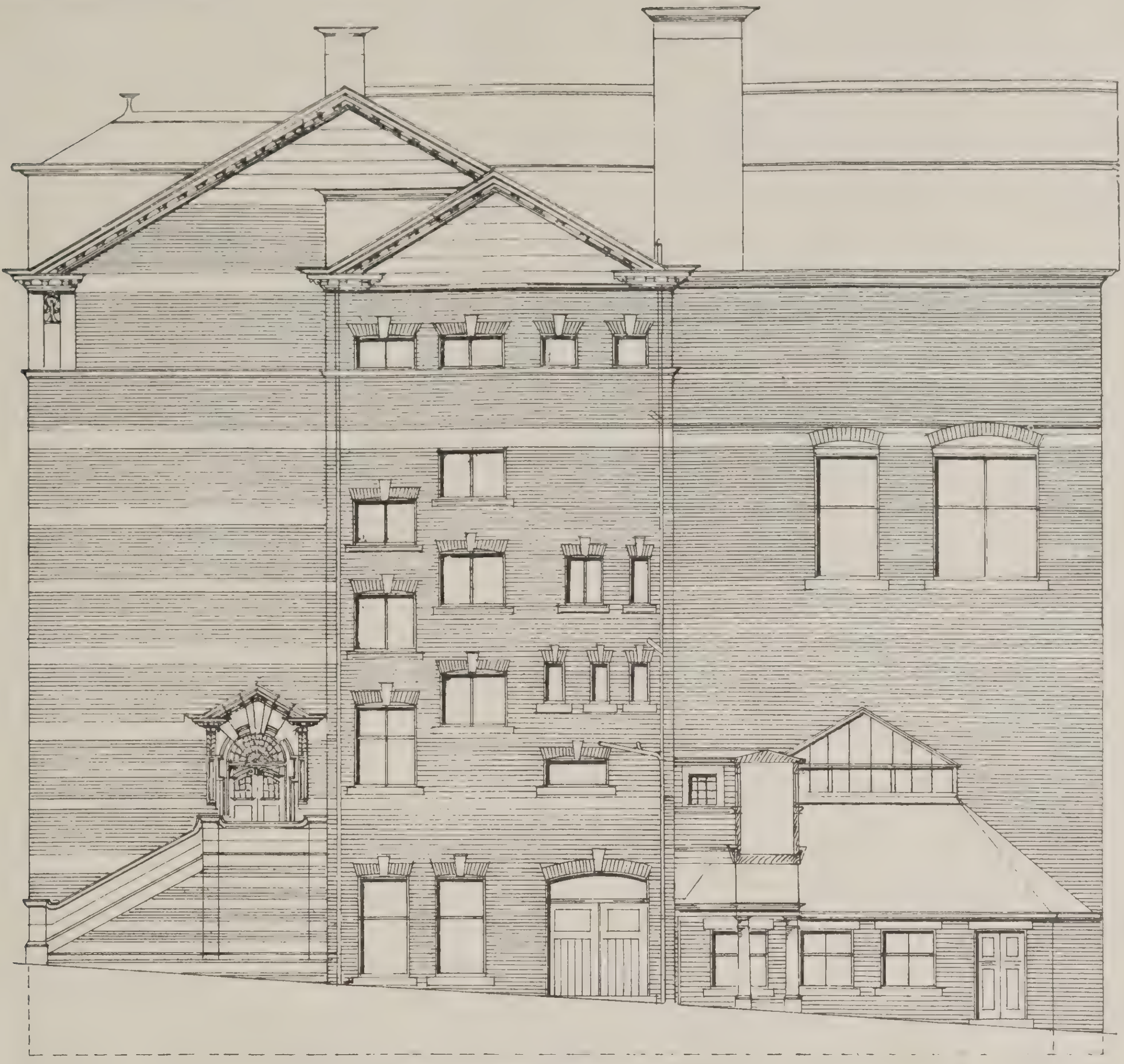
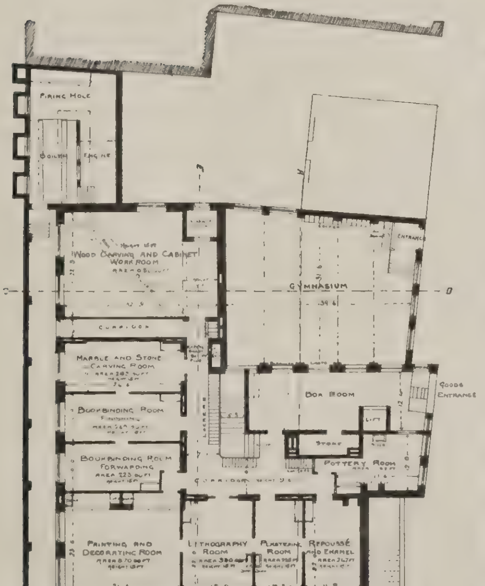
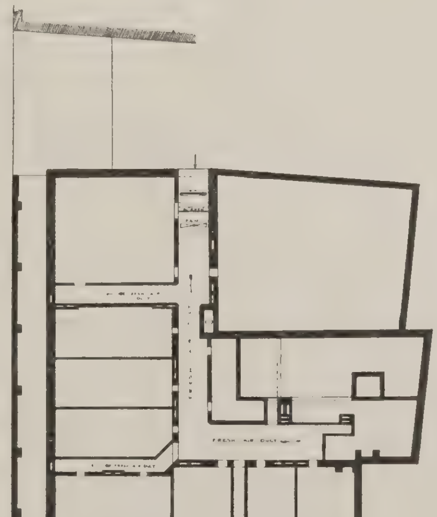


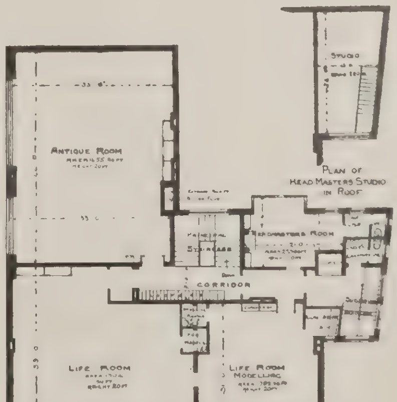
Elevation to Cookridge Street.



Basement Plan.



Basement Plan : showing system of introducing warm fresh air.



Second-Floor Plan.

Albert E. Dixon, A.R.I.B.A., Architect.

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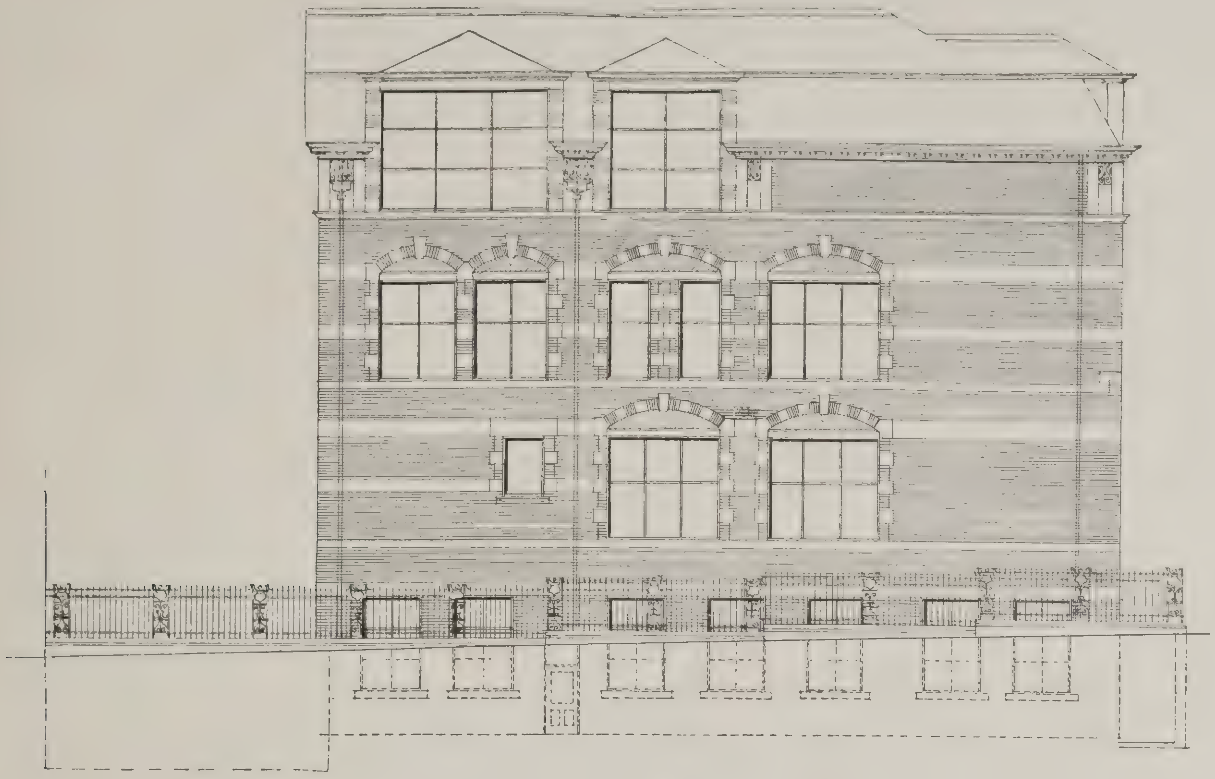
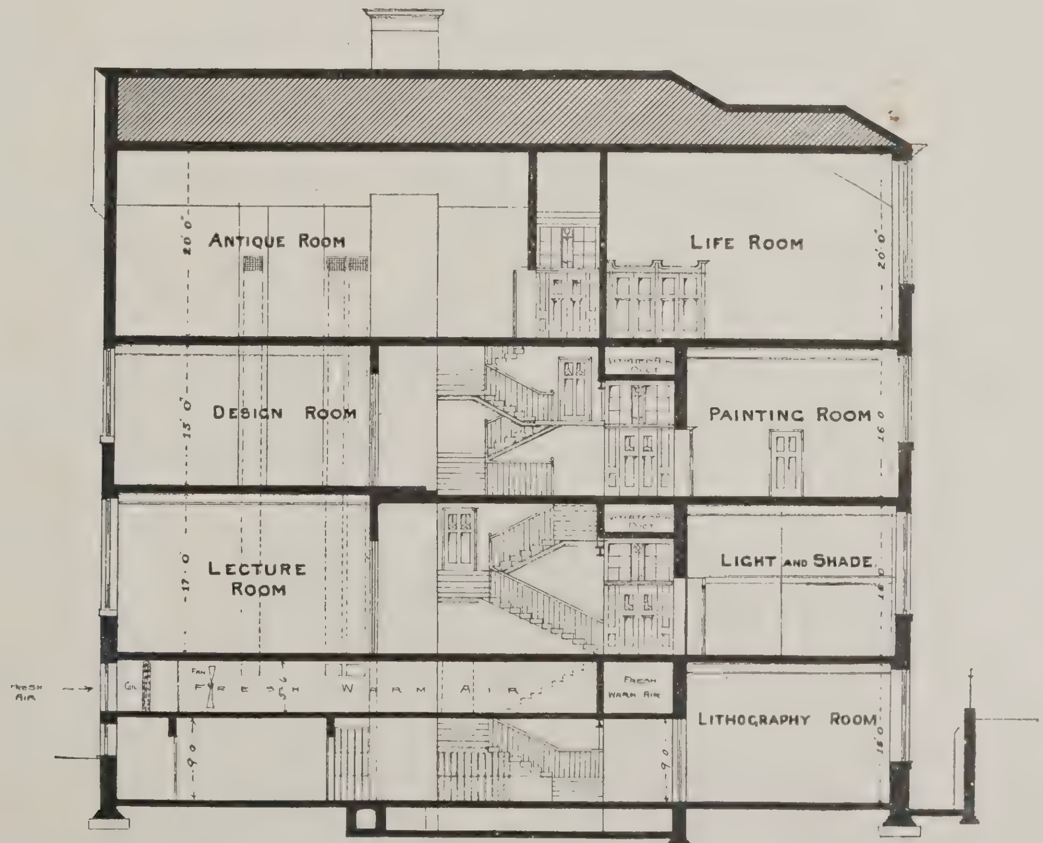


Elevation to Percival Street.



Section E.F.

Albert E. Dixon, A.R.I.B.A., Architect.

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A NEW CHURCH AT SPARKBROOK.

THE new church of St. Agatha at Sparkbrook, Birmingham, was dedicated recently. The edifice has been built by the Birmingham Churches' Fund in fulfilment of a scheme having for its prime object the removal of church accommodation from the centre of the city, where it seemed no longer required, into those outlying districts to which of late years people have flocked in ever-increasing numbers. St. Agatha's Church has cost £15,000, and this amount will be paid out of the proceeds of the sale of Christ Church, which was for so many years a well-known landmark in the centre of the city. The original foundation-stone of the old church has been built into the base of the tower of the new structure; and among other things taken to Sparkbrook from New Street are the font and communion table; the single bell, bearing the inscription "John Rudhall, Glocester, Fect. 1813"; and a quantity of the mahogany panelling of the old pews of Christ Church, which has been used in the new baptistery and in the clergy vestry. The church occupies a site adjoining the Board schools in the Stratford Road, and has been erected from the designs of Mr. W. H. Bidlake, and under his superintendence. It is a building of lofty proportions and massive walls, in the Late Decorated Gothic style, with an original interpretation of traditional forms; and accommodation is afforded for more than 1,000 worshippers. The materials employed are buff brick facing within, and red and blue brick without, with Hollington stone and Bath stone dressings. The roofs are covered with grey-green Whitland Abbey slates. Much of the eastern part of the church is hidden by surrounding buildings, but this is compensated for by an imposing west front and lofty tower facing the Stratford Road. The tower is 120ft. high to the top of the parapet, and is surmounted by a flèche rising 40ft. higher. It is constructed to house eventually a peal of eight bells, and the large belfry lights in the upper part of the tower form an important feature in the design. The gilt skeleton dials of a clock adorn the north and south sides of the tower. Below the belfry is the ringing stage, lighted by coupled windows in each face. From the base of the tower projects a semi-octagonal baptistery, over which is the west window, which is in turn surmounted by elaborate sculpture in canopied niches representing Christ in majesty supported by the angels of Justice and Pity and surrounded by angels. On the north and south sides of the tower, and forming with it a symmetrical facade, are lofty porches, whose tympana are filled with sculpture illustrative of the martyrdom of St. Agatha; while the arch mouldings are decorated with cherubs' heads. The interior consists of a nave 120ft. long and 29ft. wide, separated from wide aisles by arcades of Hollington stone arches. Projecting shafts rise between the arches, and, terminating at the cornice level in corbels of leaf sculpture, carry transverse timber arches supporting the timber ceiling, which is partly decorated in colour. The clearstory, and indeed the church generally, is lighted by elaborate traceried windows, nearly every window being of different design. The chancel is also terminated with an elaborate traceried window, which it is hoped may be filled with painted glass. The chancel is separated by arcades from a choir transept, over which is the organ chamber on the north side, and from an ambulatory which communicates with the vestries on the south. The choir seating is of fumigated oak, that of the nave being of sequoia wood. The pulpit, also of fumigated oak set on a stone base, is the gift of Mr. A. M. Chance. The builders were Messrs. John Bowen & Sons.

Christ's Hospital Bill was read a third time in the House of Commons last week.

Permanent Council Chamber and Offices of the Monmouthshire County Council.—The foundation-stone of this building (in Pentonville, Newport) was laid recently. Mr. W. Tanner, the county surveyor, is the architect, and Messrs. D. Richards, Ltd., of Newport, are the builders. The contract price is £8,470.

THE PRACTICE OF STACK BUILDING AND BOILER SETTING.—I.

By JOHN G. DUNN (Instructor in Building Construction).

ALTHOUGH it may be said that this is more a subject for the engineer than for the architect, yet how frequently has the latter (especially in planning factory buildings) to provide a chimney stack and boilers. Stack building might be classed with the French system of bridge building, which demands the co-operation of engineer and architect.

In our public works, factories, &c., the chief requirements are a good supply of steam and the carrying away of all obnoxious gases, and it is therefore essential that they have quick-heating boilers and a good chimney stack.

In our own district we are best acquainted with Tennant's stack at Port Dundas, Glasgow (453ft. high) and the Townsend stack (460ft. high).

Much may be said about forced draughts. Some say the day is not far distant when there will be no need for tall chimneys. So far as my experience goes, we have not yet got a forced-draught system, which can be worked cheaper and do the work of a chimney stack. To solve the problem I think we must take into account the diffusion of the gases as well as the creation of draught, or, in other words, we must either have a tall chimney or else a means of purifying the gases as they leave a short stack, for although we may provide means for burning the smoke we must remember that it is not possible to consume every atom in a piece of the coal commonly used for raising steam in works. Tall stacks are at least needed in such places as chemical works to carry the gases to a reasonable height.

As a rule chimney stacks are built of brickwork. We have examples in stone, but not many, and only when the stones have been cut practically like large bricks and are able to resist the disintegrating powers of the gases have they proved very satisfactory.

Common working stacks (say in steelworks, where there is a stack for each melting furnace or for every pair) are often constructed of steel or iron plates bolted together and the whole held in position by tension rods fixed to surrounding bases. When any of these rods become cut they are apt to cause the stack to overturn, but this danger is much minimised now by fixing the stack bottom with bolts to a very wide base. Stacks of this kind should be lined inside with firebricks.

There are three requisites to a chimney: (1) Efficient draught; (2) stability; and (3) a satisfactory architectural appearance on elevation.

We shall consider chiefly the stability. It is not always easy to retain the perpendicular in these great shafts. One of the chief causes for their going off the plumb is insufficient foundation, or starting to build without ascertaining the nature of the underlying rock stratum, and so causing unequal settlement; with having one-half of the foundation on a compressible soil and the other on an incompressible, or less compressible, soil. In one instance within my knowledge a stalk about 80ft. high had to be erected at a colliery, and, without even examining the foundation, the builder started with regular footings. All went well until the stack was about 50ft. high, and then it was noticed to be leaving the plumb, becoming worse each day. The contractor, who was also the builder, wanted to stop and rebuild, but the company offered to pay for all damages if he would still try to complete the stack. He accepted the risk, and was building the stack hanging on one side and battering the other. The stack was completed and only the tackling needed to be taken down, but when on the next morning they went to clear everything the stack was lying in the adjoining field. On examining the foundation it was found that at a good depth and along one edge of the foundation there was a large drain. While the stack was taking its bearings this side settled more than the other!

In another instance of a stack leaving the perpendicular, the concrete foundation was put in as usual, excepting one part. This was filled in with bricks and mortar (in the absence of inspection) because the cement was finished. Owing to unequal settlement the stack left the plumb when 110ft. high. The soil was of a very sandy nature.

Still another cause of stacks leaving the plumb is the prevalence of the wind in one direction while the stack is in course of erection, or perhaps a fierce gale which arises before the work has actually set, even though the actual building is completed. Another cause is the cutting of portholes at the bottom after the stack has taken its bearings. I have known this to be done without the consequent results being considered at all. Still another cause of stacks leaving the perpendicular is allowing courses of brick to pitch or be built off the level.

There are many ways of bringing stacks, church spires, &c., back to the plumb, the most common (and in my opinion the best) being to saw the horizontal joints on the round on bulging side, thus bringing back the weight; or some of the bricks may be cut out and pinned up again (a very dangerous operation). Too much care cannot be given to the foundations. The same rules apply to these as to other buildings, except that the nature of the foundation should be considered for a greater depth, owing to the very great weight concentrated on a small area. A stack in a mining district should be as far as convenient from the pit shaft in order to avoid the vibrations caused by the winding engines. Even though the foundation is of the best character, I would advocate the use of an artificial conglomerate such as Portland cement-concrete to ensure against crushing at any one point, and also to give a proper level bearing to the stack (rock strata often lie at an angle to the surface level). Much has been, and may be, said about the width of concrete foundations for any given stack. This should always be determined after the nature of the foundation has been ascertained, but a foundation of concrete is not too wide provided it does not exceed the body of the concrete—that is, do not have concrete so wide that, considering its thickness, it will fracture round the line of crush.

A grillage of steel beams on iron tiers may be bedded in the concrete foundation to add to the tensile strength, especially in treacherous soil. The pressure on a concrete foundation shall not exceed 22 cwts. per sq. ft. If the angle of 60 degs. beyond the face of the wall is exceeded the concrete must be thickened accordingly.

This crushing is greatly remedied by footings, which are of the greatest importance. They also act (especially in isolated structures standing on small bases) against the danger of the work being forced out of the perpendicular by the wind. Footings should project at least the thickness of wall beyond the face of the work and be set off in regular offsets of $2\frac{1}{4}$in. and not more than 3in. to avoid fracture of the bricks. Let us take the case of a chimney stack 100ft. high standing on a base 10ft. square and exposed to heavy gales. The compression of the ground to leeward to the extent of 0·025ft. would be sufficient to cause the top of the stack to overhang 6in. If, however, we increase the base to 20ft. square we not only double the leverage with which the foundation resists the force of the wind, but the bearing surface is quadrupled, so that the total resistance is eight times greater than in the first instance. It need scarcely be said that for footings to be efficient they must be securely bonded into the body of the work and be of sufficient strength to resist the violent cross-stress to which they are subjected. The lower the brick the greater the weight there is upon it, and the important matter to observe is that the back joints are as far from the face of the wall as possible. A good arrangement in foundations is to lace a few of the bottom courses together. Another rather special method is to introduce the inverted arch in the interior of the chimney. The plan of a circular shaft is like a kiln crown, that of a square one being ribbed. This is not a very common practice.

The thickness of the work in stacks needs also to be carefully considered. The common rule is to start from the top with 9in., adding

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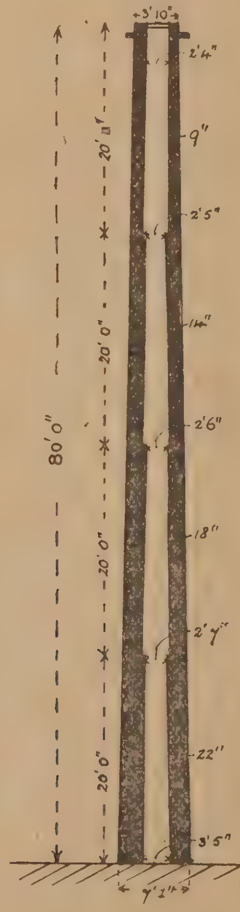
[*] A paper read before the Glasgow and West of Scotland Technical College Architectural Craftsmen's Society.

4½in. every 20ft. or 25ft. downwards, the width at the bottom being one-tenth the height for square stacks and one-twelfth for round ones. The common batter from bottom upwards is ¼in. per ft. I have been concerned with many stacks battering 3/16in. per ft., but prefer ¼in. or 1in. in a yard. I think the thickness of the work should never be less than 14in. at the top, especially if the stack exceeds 80ft. This gives a far stronger body of work to bond in a heavy or hanging head, and is not nearly so liable to get racked or rent up.

The amount of batter given to a stack chiefly concerns architectural taste, and although the engineer prefers a plain obelisk, he may secure this internally without affecting the draught to any perceptible extent and yet have a finely proportioned architectural column. A stack should not be ornamented at the expense of its stability, but it is preferable not to leave it entirely plain. This is one good reason for having 14in. work at the top instead of 9in.

Argument still persists as to whether a stack should diminish in sectional area inside, or whether it ought to be parallel (as wide at the top as at the bottom); or, again, whether a chimney should be even wider at the top than at the bottom. It does not fall under our consideration at present to determine what are the proper dimensions, especially as regards the internal area of a chimney-shaft, most suitable for a steam engine of any given horse-power or for burning a given quantity of coal per hour; but here is an example: The area of a chimney in inches for a low pressure steam engine when of more than 10 h.p. should be 112 times the h.p. of the engine divided by the square root of the height of the chimney in feet.

Example: Required the area of a chimney for an engine of 50 h.p., the height of the chimney being 80ft.



$$\frac{112 \times 50}{\sqrt{80}} = \frac{5600}{9} = 622 \text{ sq. in.} (\sqrt{622} = 25\text{in.}) \text{ sq.}$$

$$622 \times 1{\cdot}27 = 78994\ (\sqrt{78994})\ 2\text{ft. } 8\text{in. circular.}$$

This gives 2ft. 1in. for the side of a square stack and 2ft. 4in. for the diameter of a circular stack.

Adopting Tredgold's rule to Mr. Milne's data, it only requires the constant multiplier 112 to be substituted by 280 and the calculation in the above case will then be as follows: $\frac{50 \times 280}{\sqrt{80}} = \frac{14000}{9} = 1555$ sq. in. = 3ft. 3½in. for a square stack.

This just shows how engineers differ, but it will be interesting to notice the following example taken from the common rule—that of only considering the height and having one-tenth the height for a square stack and one-twelfth for a circular one:—

An engineer requires a circular stack of 2ft. 4in. least diameter. We shall begin at the top with 2ft. 4in. internal measurement and with 9in. walls, adding 4½in. every 20ft. downwards.

ft.	in.	
2	4	internal diameter.
0	10	batter.
3	2	
0	9	brick additional
2	5	diameter 20ft. down.
0	10	batter.
3	3	
0	9	brick additional.
2	6	diameter 40ft. down.
0	10	batter.
3	4	
0	9	brick additional.
2	7	diameter 60ft. down.
0	10	batter.
3	5	internal diameter at 80ft. down.

Add thickness of walls to diameter, namely, 3ft. 5in. + 1ft. 10in. + 1ft. 10in. = 7ft. 1in.

As one engineer rightly puts it, a chimney (disregarding cost) is never too large or too powerful provided it has efficient means for checking the draught by properly fitting dampers, or otherwise, whereby the supply of steam can be readily controlled at any moment, so as to work the engine at half its full power and using considerably less than half the power of draught of the chimney, thus having a surplus draught for emergencies. When the chimney is too small it is unable to create a sufficient draught through the furnace. A smoky flame is then produced, instead of a flame with little or no smoke. When the chimney is too small (as often happens) it becomes overworked, an undue pressure is brought to bear upon its sides, and this often leads to the chimney becoming cracked. Too much stress cannot be laid on the turning of the arches over the portholes at the bottom; semicircular or deep segmental arches are the most satisfactory, the centres being lowered a little by means of wedges and then drawn together, so that they may take the ever-increasing weight before the actual setting of the mortar. It is best to have, say, a round chimney on a square base. This allows properly constructed arches to flues to be provided at the bottom: otherwise you have circle on circle arches, which are not very satisfactory.

Much difference of opinion exists regarding the bond of chimneys. In the first place, I would say a round chimney is the best, as you never have so many bats or closers as in a square, octagonal or hexagonal stack. The bond varies as the sectional area of the stack decreases. This is a slight objection to octagonal and hexagonal and also square stacks (especially the first and second) especially if they are not circular inside. Although it is desirable to have as many headers as possible in the interior of a wall to resist direct crushing, yet in the case of chimneys it is possible to have too many headers. Chimney sides extend so short a distance that what is needed is a bond which will keep the sides from falling asunder. I have never yet known a case where the headers in a chimney were snapped and the work split for want of transverse bond; whereas I have seen much cross-splitting due to very little more than want of longitudinal bond (or we may call it half bond). Circular brick should be used for the whole of a circular stack. Hoop iron (tarred) is a great help to a chimney bond. It is placed vertically either in a longitudinal joint one brick deep or between two courses deep, and at vertical intervals of 6ft., 10ft. and 20ft. All stacks should be lined with firebrick from half-way or two-thirds up. Care should be taken to have an air-space between this lining and the outside brickwork. The lining being independent should have ties occasionally into the outer wall. Sometimes special firebrick blocks are used when the air-space exceeds 6in., but where the space is only 2in. or 4in. the common headers can be used quite well at intervals of from 3ft. to 6ft. In small chimneys (60ft. or 80ft. high) the common practice is to line them with 4½in. brickwork having a 2in. to 4in. cavity, but (and especially in large chimneys) I would advocate a 9in. lining and a cavity of not less than 6in. to 9in. When the stack exceeds 150ft. in height there should be a 14in. firebrick lining at the bottom reducing 4½in. every 50ft. Of course gases enter some stacks at a higher temperature than in others. For instance, as a rule a higher temperature (10,000 to 15,000 degs. F.) is given off in a gasworks, necessitating the use of thicker lining. This lining should be bonded in with the main wall at its end so as not to affect the draught. In order to ventilate the cavity and so keep the brickwork comparatively cool, ventilators are fixed in openings through the main wall. As a rule four regulating ventilators are provided at the bottom and the same number about 20ft. or 30ft. up. This causes a draught.

The mortar should be of the best quality; the bricks hard, durable and calculated to resist crushing, great care being taken to have them bedded properly, especially if they have deep frogs, otherwise they will frush at the edges. I think it is a great advantage for the last 20ft. or so to be built with cement mortar, using say, slaked shell lime for sand. This preserves the top against the disintegration of the atmosphere and stands heat well.

(*To be concluded.*)

NEW NURSES' HOME AT THE CLAYTON HOSPITAL, WAKEFIELD.

A NEW nurses' home is being erected at the eastern end of the Clayton Hospital at Wakefield. As the recent erection of a children's wing at the western end completed the hospital in that direction, so the new nurses' home will complete the other end. The newly added wing or nurses' home is being erected in direct communication with the hospital, and the receiving entrance for accidents, &c., instead of being at the end, as formerly, is situate at the front of the new building, which opens into a commodious receiving-room on the ground floor, in which also will be a dining-room, housemaids' pantry and a sitting-room for the accommodation of the staff. The new portion, like the old, is being erected with an eye to the comfort and convenience of a patient, tender-hearted, but much neglected class of servants, and no fewer than nineteen bedrooms are now being fitted up for the nurses' exclusive use, with box and linen rooms, &c., on each floor. The corridor and staircase are fireproof, and the walls of brickwork, pitch faced with Elland Edge stone, are made to match the older portion of the hospital, which since its erection has kept remarkably clean compared with some other buildings in the city. The old entrance has been carefully removed and fitted up again in the same style of architecture, that of Flemish Gothic. The drive in the front will eventually be altered to meet the altered conditions of the buildings. Messrs. Simpson & Richardson, architects, Southgate, are responsible for the design of the new portion, and the masonry work is being carried out by Messrs. W. Kitson & Sons, the carpentry and joinery by Mr. W. Judge, the plumbing by Mr. S. Atkinson, the plastering by Mr. C. Driver, the painting by Mr. T. Naylor, slating by Messrs. Pickles Bros. (Leeds), and the electric light installation and engineering by the Wakefield Electric and Engineering Company. The cost is estimated at a little over £3,000.

COLOGNE CATHEDRAL.

RHINELAND.

FROM the days of the Grand Tour and the old French wars downwards the mouth of the Rhine has formed, in a sense, one of the great river gates to the Continent. It was left to "Childe Harold" to glorify the upper Rhine reaches and set a fashion to a touring world; to Clarkson Stanfield, David Prout and their school to adorn in exquisite steel line never equalled the then romantic and almost remote beauties of Byron's "Pilgrimage." Later, as fashion changed, and facilities increased for visiting the uttermost ends of the earth, Rhineland ceased to be popular. To-day it is scarcely thought of as a touring ground. Yet one has only to read a little pamphlet on the little-known side valleys of the Rhine by Mr. Percy Lindley (30, Fleet Street, E.C.; free) to appreciate these charming by-ways.

Some of the little valleys have long been favourite German holiday haunts. Hence, the inns are sufficient, and, if unpretending, supply all wants of sensible travellers.

The tributary Rhine valleys between Cologne and Coblence, with the Ahr and the Moselle, and the volcanic Eifel district, might well be called the German Ardennes. Some are quite as quickly and cheaply reached, and are as yet unspotted of the "personally conducted" holiday world. Beyond Coblence are the Lahn Valley and Taunus Mountains, and the Nahr Valley, which can be visited *en route* to Metz and the Battle Fields, and to the Vosges—the Blue Alsatian Mountains. Beyond Mayence is the charming Odenwald district, which can be taken from the Lahn and Taunus *en route* to the Neckar Valley and Heidelberg, and thence on to Strassburg and the Vosges. All or part of this Rhineland holiday opens up a prospect of mountains and valleys, woods and rivers, and old German towns and cities, with their antiquities and art treasures, as handy and bright headquarters. And on the homeward track there are Brussels and Antwerp.

The journey is easy. At Liverpool Street you catch the boat train to Harwich. Once there alongside the quay, you walk direct to the train.

Going through direct from the Hook or Rotterdam, Cologne is reached soon after noon. The traveller staying overnight at Rotterdam, Dort or Nymegen can catch this train the following morning. From Dort it is sixty-five miles by rail to Nymegen. You first see the town from the rail, perched up on the high facing banks of the Waal, as this arm of the Rhine is called. From the tree-lined river quays its red roofs and gables rise in broken lines, topped by ancient towers and spires.

One makes for the big church tower which shadows the market-place, which on market days is filled with the vegetable, fruit, meat and poultry stalls, under white awnings or big umbrellas. Framing this old-world scene on one side stands an early seventeenth-century weigh-house and fleshers' hall, a delightful red-brick gabled building with a double flight of steps leading to the entrance on the first storey. On the other side is the church, the Groote Kerk, with its massive brick tower topped by a curious bulbous-shaped spire, crowning the open belfry with its hanging bells. Here near the market-place is the fifteenth-century town hall. Its purple-toned brick façade is decorated with statues of German emperors between tall windows. Entering, you find yourself in the council chamber, a delightful hall with heavy beamed ceiling and grey-black marble floor; at one end a raised daïs and row of carved wooden stalls.

It is a pleasant drive or cycle ride through wooded country to Cleves, and thence the rail runs to Cologne.

From Cologne, Bonn, the pleasant university town is only twenty miles away, and Bonn marks the entrance to the picturesque Rhine Valley. Seven miles beyond are the Seven Mountains, with the "castled crag of Drachenfels" which "Frowns o'er the wide and winding Rhine." It is among the Seven Mountains that the seeker after fresh pastures finds how unhackneyed, almost unfrequented, Rhineland's waysides can be.

In the Valkhof, a little wooded park crowning the green slopes seen from the river, the historic and picturesque interest of Nymegen centres. It is the site of the great castle dating from the time of Charlemagne. Of the noble building where twenty emperors and their suites were lodged; of the vast halls where foreign ambassadors bowed their heads before the Christian successors of pagan Cæsars; of the luxurious chambers where Charlemagne, Louis le Debonnaire, Charles the Bold, slept; of ancient gates through which the paladins made their way to the Holy Land—of all this grandeur there only remain now a couple of small simple vestiges. The other fragment is the ancient baptistery, a small octagonal building, consecrated by Pope Leo III. in 799.

The advice given by Hood's cynic in "Up the Rhine" was "Don't wash or be shaved; go like hairy wild men, play dominoes, smoke, wear a cap, and frock-smock it. But if you speak English, or look like it, then Take care of your pocket—take care of pocket." But things have changed since then.

Those who desire further particulars of a Rhineland tour should obtain the pamphlet by Mr. Lindley, to whom we are indebted for the accompanying illustrations of Cologne and Treves Cathedrals.

THE CATHEDRAL, TREVES.

Law Cases.

Coventry Builder Fined.—At Coventry Police Court recently Spencer Bush, builder, Wren Street, was fined £5 and costs for having erected ten houses in Smith Street without sending in a block-plan of the buildings, as required by the by-laws.

Fined for Using Bad Mortar.—Frederick Gardiner builder, Plumstead, was summoned at Woolwich recently for using mortar in the erection of a building in Grossmount Road, Plumstead, which was not composed in accordance with the by-laws. He was also summoned for non-compliance with a notice of the district surveyor with regard to such irregularity. It was stated that it was the only case in the district where bad mortar had been used. The mortar complained of contained too much earthy matter. The magistrate made an order to comply with the notice to make good all parts built with bad mortar and £5 costs. In the second case a fine of £1 and £2 2s. costs was inflicted.

The Working of Sand-Holes.—The case of *Cockbill* v. *Perry* was heard recently at the Birmingham Summer Assizes. This was an action brought by William Cockbill, haulier, of Walsall, to recover damages for the loss of his son, caused, as was alleged, by the negligence of Benjamin Perry, builders' merchant, of Walsall. The case for the plaintiff was that on February 12th young Cockbill was sent to a sand-hole owned by the defendant to fetch a load of sand. The face of the sand was 15ft. or 20ft. high, and a few feet from the ground was a bench upon which loading carts were accustomed to stand. Whilst the lad was standing upon this bench filling his cart from the loose sand there about thirty loads of sand fell from above, completely submerging him as well as the horse and cart. When dug out fifteen minutes later the youth was dead. It was contended that the sand-hole was improperly worked, inasmuch as a proper angle of repose was not maintained, and the top-soil was allowed to overhang those working at the bottom. The defendant in his evidence said he had worked the sand-hole for ten years under the special rules framed by the Inspector of Mines, who visited the place from time to time. He said that as the sand was of a hard nature it was impossible to work it with such an angle of repose as the plaintiff suggested. In his opinion the fall was caused by the frost. Other witnesses were called with a view of proving that the sand-hole was worked under safe conditions. The jury found for the defendant, and judgment was entered accordingly.

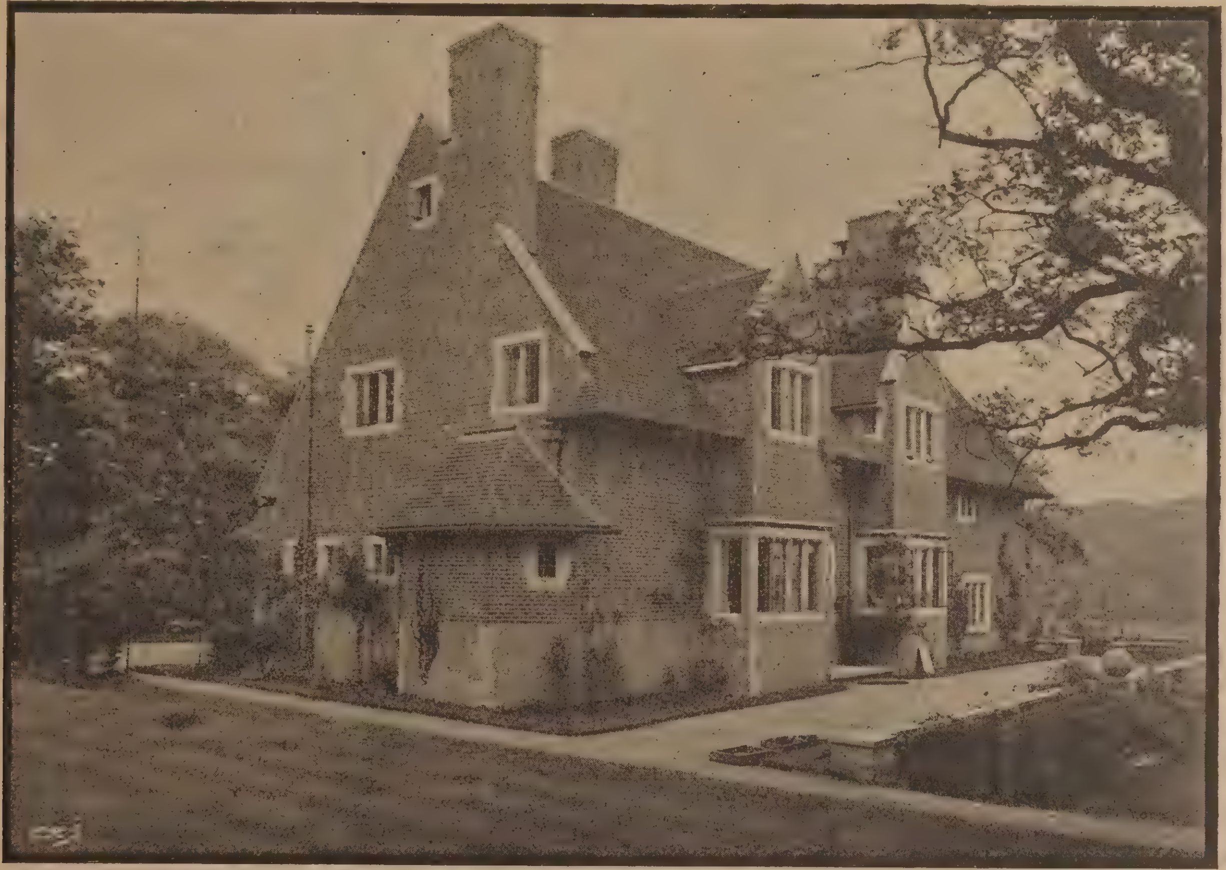
An Audacious Act.—At the Carnarvon Police Court on July 29th a butcher named Jones was summoned for a breach of the Public Health Act. Mr. Trevor Roberts, who prosecuted, said that the defendant submitted to the council plans of a slaughter-house which he proposed to build, but the council rejected the plans. Subsequently the defendant presented plans of a coach-house, and these were approved. The coach-house was erected, and it was found that it was being used by the defendant as a slaughter-house. The bench fined the defendant £5, but the fine would not be enforced if the defendant ceased to use the building as a slaughter-house.

Protection of Factory Employees against Fire.—On July 29th an arbitration was held at the Royal Courts of Justice between the London County Council and the Morgan Crucible Co., Ltd., which involved a question of considerable interest to owners of factories and to the building trade in general as to what is or is not a reasonable requirement on the part of the London County Council, as sanitary authority under the Factory and Workshop Act, 1891, in regard to the provision of a means of escape in the case of fire for persons employed in a factory. The Morgan Crucible Co.'s premises are in Church Street, Battersea, and consist of several blocks of buildings. Early in 1900 the premises were being reconstructed, and after inspection by an architect on behalf of the county council certain requirements were made by that body that alterations should be carried out with a view of providing adequate means of escape for persons employed on the premises. The Morgan Crucible Co. carried out the alterations in accordance with the requisitions made on them, so far as they thought them reasonable or necessary. Blocks A and B of the premises in question were practically one block and communicated with each other. Block A was provided only with an internal open wooden staircase, but at the corner of blocks B and D an external iron staircase was erected. The owners considered that the internal staircase in block A, together with the iron staircase in block B, to which there was access from block A, was amply sufficient as a means of escape from block A in case of fire. The London County Council contended that this was not sufficient, and they required the owners to provide an external iron staircase at the south-east corner of block A in addition to the staircases already provided. The owners declined to accede to this requisition, and the matter was therefore referred to arbitration. The arbitrators were Mr. Thomas Blashill, representing the London County Council, and Mr. Morris Adams, for the Morgan Crucible Co.; and Mr. F. R. Y. Radcliffe, barrister-at-law, was umpire. On the part of the London County Council evidence was given by Mr. W. E. Riley, architect, who surveyed the factory for the Home Office, and Mr. Rowland Plumbe, architect, who inspected the premises at the request of the London County Council. They expressed their opinion that the present means of escape from block A were in sufficient, and an additional staircase was necessary. They believed that in the case of fire the internal staircase in block A would become filled with smoke, and the inmates of the block would be prevented from reaching block B. Mr. Chatfield Clark, surveyor to the Board of Trade, expressed a similar opinion. For the Morgan Crucible Co. Mr. Basil E. Peto, a director of the company, said that when they received in January last year a notice from the London County Council alterations were being made in the premises, and the council's requisitions were complied with, except so far as the erection of a staircase at the south-east corner of block A was concerned. The owners considered that the present outside staircase in block B was amply sufficient. The estimated cost of the staircase proposed to be erected was £600, and it would involve a loss of 9,600 cub. ft. of space, which represented a money loss of £340. The superintendent of the fire brigade at Leicester considered the means of escape from the building ample. The arbitrators reserved their award.

Faulty Drainage Connections.—George Blakeman, builder, was summoned at the Coventry Police Court on July 29th to answer three summonses for breaches of the sanitary by-laws of the city. The town clerk stated that the case related to a house in St. Patrick's Road, which had been recently erected by Mr. Blakeman. In the first place defendant was summoned for erecting a house not in accordance with the plans passed. In the second, the by-law contravened was

HOUSE AT FOUR OAKS, SUTTON COLDFIELD: ENTRANCE FRONT. W. H. BIDLAKE, M.A., ARCHITECT. (*Photo by H. Irving.*)

No. 62, which provided that the drainage system of a house communicating with the sewer should be cut off with a suitable trap at as distant a point from the building as practicable. The third summons was taken out under by-law 64, which required that the drainage pipes of the house should be ventilated by at least two untrapped openings. In the plans finally approved by the Surveyors' Department the house was shown as connected with the main sewer in St. Patrick's Road, with a disconnecting chamber and a fresh-air vent-pipe nearer the house; but the house as built was connected with a rainwater drain, which was not a sewer, and there was no disconnecting trap and no ventilation to the drainage of the house. Evidence was given by the city engineer, Mr. J. E. Swindlehurst, to the effect that the present arrangements of the drainage were the same as in the first plan submitted by Mr. Blakeman, which was objected to. In defence Mr. Blakeman said there had been no substantial alteration in the buildings from the plans approved. With respect to the disconnecting chamber, there was one on the main drain disconnecting the houses with the sewer. There was nothing in the by-laws to prevent him leading the waste from the bath into the drain in front of the houses. The Bench imposed a penalty of £2 and costs in the first case, suggesting that the other two might be withdrawn on payment of costs by the defendant.



HOUSE AT FOUR OAKS, SUTTON COLDFIELD: GARDEN FRONT. W. H. BIDLAKE, M.A., ARCHITECT. (*Photo by H. Irving.*)

A Curious Claim for Damages.—In the King's Bench Division on Wednesday last the case of *Richards* v. *Randall* was heard. This was an action to recover damages for injury done to a studio and its contents through the alleged negligence of the defendants' servants. The plaintiff, Mr. Frank Richards, an artist, occupied a studio at Addison Mansions, Kensington, and last January the defendants, Messrs. Kirk & Randall, contractors, were erecting a large post-office close by, to which was attached a chimney between 70ft. and 80ft. high. For the purpose of constructing the premises the defendants had built a large scaffold. On Sunday, January 27th, whilst a strong gale was blowing, a piece of wood about 2ft. long, which was said to come from the defendants' premises, was blown up against the plaintiff's windows, smashing them and letting in the rain, which did damage to the plaintiff's pictures and the furniture to the extent of £75. This sum the plaintiff now sought to recover. The defence was that it was not shown that the wood that did the damage came from the defendants' premises, and even if it did the storm was an exceptionally severe one which could not have been anticipated or guarded against, and that therefore the defendants were not liable. The jury gave a verdict for the plaintiff for £75, the sum the parties agreed the plaintiff was entitled to if he succeeded in establishing his case.

FIREPROOF AND RUSTPROOF STEEL CONSTRUCTION.

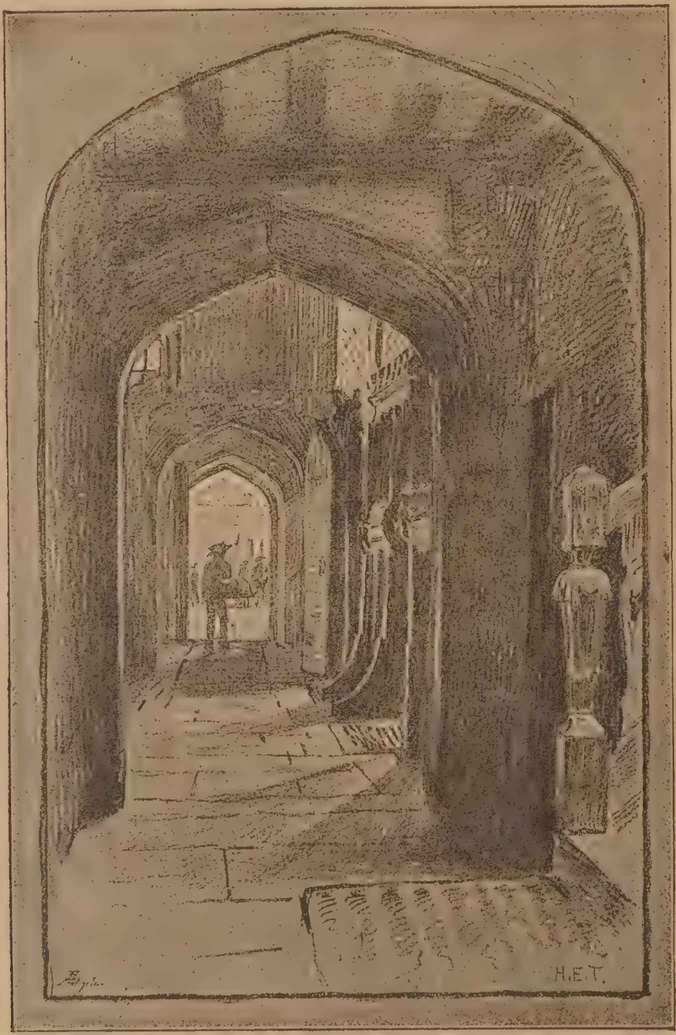
A MAGAZINE called "Insurance Engineering" has recently been published in America, and one of the best articles in it is on the "Fireproof and Rustproof Construction of Steel Buildings," by Mr. Frank B. Abbott. Reviewing it, the "American Architect" says: "Everyone knows that the modern steel-frame construction is exposed to serious dangers. There have been repeated instances where steel or iron frames in buildings, when partially stripped of their masonry covering, have shown uprights particularly deeply corroded after only a few years' standing. In other cases the steel has shown no signs of deterioration, and it is obviously a matter of the highest importance to know what are the conditions which secure immunity. We will not try to give an abstract of Mr. Abbott's paper, but it may be useful to emphasise one of his conclusions, which is that metal intended to be entirely embedded in masonry or concrete, as is usually the case with uprights and often with beams in fire-proof construction, should not be painted. Even the ordinary painting at the mill should be omitted, the mill scale being simply knocked off and every trace of rust removed by cleaning with wire brushes before the metal receives its masonry casing. Where the steel is thus left bare, the cement from the surrounding concrete or from the masonry, if this is grouted where it touches the metal as it always should be, attaches itself to the surface, forming a coating which defies oxidation, while paint slowly disappears, leaving a crevice between the steel and the masonry into which moisture or moisture-laden air, the arch-enemy of iron, can easily penetrate.

"Although this suggestion is not altogether novel, it will, we imagine, be new to most architects. The practice of painting all structural steel is so universal that something more than theoretical considerations will be necessary to change it; but we are inclined to think that experienced members of the profession will be able, if their attention is called to the matter, to furnish extremely valuable evidence in regard to it. We are told, for example, on the authority of Viollet-le-Duc, that iron ties have been taken from the masonry of Notre Dame, in Paris, in which they had been embedded for nearly 700 years, as bright as when they were first put in; while one of our own correspondents, the late Mr. James Freret, of New Orleans, mentioned a case within his knowledge where iron ties in masonry had been completely destroyed in a few years. The masonry of Notre Dame, consisting of limestone laid in lime mortar, would not resist moisture so well as our modern masonry laid in mortar partly hydraulic; and the difference between the two cases would seem to lie rather in the condition of the iron than in that of the masonry around it. In the New Orleans building the iron was undoubtedly painted, according to the modern practice, before it was built into the brickwork, while the iron ties in the Paris building are more likely to have been made by a blacksmith on the spot and utilised immediately; so that it is not improbable that the coat of paint alone may have been the source of the trouble."

House at Four Oaks, Sutton Coldfield.—This house, of which two views are given on this and the opposite page, was designed by Mr. W. H. Bidlake, of Birmingham, for himself, and is an excellent type of the new domestic design, more especially in its grace of form and modelling (if the latter term may be borrowed from another branch of art), suggesting comparison with the domestic buildings of Gloucestershire, which are unsurpassed in this respect.

A NEW AGRICULTURAL COLLEGE.

NEW buildings for the South-Eastern Agricultural College at Wye, Kent, have just been opened. They have been erected from the designs of Mr. T. E. Collcutt. The new work consists in the extension of the quadrangle, begun in 1894, as far as the boundary of the college property, and the addition of a further wing, together with additions and rearrangements in the kitchens and domestic buildings. The refectory has been enlarged by taking in a passage so that the old minstrels' gallery now becomes a gallery in fact as well as in name. The biological laboratory, built in 1894, has hitherto been also used as a subsidiary lecture-room; this is now discontinued, a second laboratory bench being made to run down the middle of the room, so that there is now working space for thirty students. Opening from this laboratory a smaller one has been built for the professor of botany, with working tables, incubators and other appliances for botanical and bacteriological research. A similar laboratory has been built for the special work of the lecturer in zoology and economic entomology. Adjoining these laboratories comes the museum, a large room which is as yet without its proper equipment of cases and tables. The adjoining lecture-room is also new; with the old lecture theatre there is now accommodation for simultaneous lectures to both first and second year men. The drawing office occupies one corner of the new quadrangle. It is 33ft. long and is lighted along its length from the north; it provides working space for twenty-four students. The eastern side of the new quadrangle is completed by the principal's offices and a large common room for the students. The chemical laboratories occupy the ground floor of the new wing, which runs to the eastward of the main block of buildings. The general students' laboratory measures about 45ft. by 30ft., and is lighted from both the longer sides of the room; it is fitted with two double teak-topped benches running longitudinally, the reagent bottles being carried on glass shelves down the middle of the benches. This gives working space for thirty students; other benches in the window recesses are provided for special work. Water and gas is laid on to all the tables, and there are two fume chambers within and one outside the laboratory. Separated from the main laboratory by a glazed partition is the balance-room and the larger of the special laboratories for analytical work and research; adjoining this comes a smaller room reserved for gas analysis, titrations, &c., which require an atmosphere free from acid or alkaline fumes. Lastly, there is a small room for furnaces, a drying chamber and space for ether extractions and other operations involving the use of inflammable liquids. The old building, formerly used as a laboratory, is now taken into the domestic offices. On the first floor of the new buildings additional students' rooms have been built, so that there is now accommodation within the college for fifty students and two members of the staff. These rooms are approached by three staircases, thus dividing the rooms into separate blocks and providing ample exits in case of a fire.



IN THE LOWER CLOISTER, CHETHAM HOSPITAL, MANCHESTER.

Chetham Hospital.—For the accompanying two illustrations we are indebted to the "House" (Messrs. H. Virtue & Co., 13, Henrietta Street, W.C.). We were unable to include them with the illustrated article on this interesting building which appeared in our last issue.

Builders' Notes.

The Will of the late Mr. Thomas Willshaw, builder, of Dunham, near Altrincham, has been proved at £20,294 0s. 7d. gross.

For Structural Alterations to Conway Workhouse the tender of Messrs. D. Jones & Henry Hughes, of Conway and Llandudno, amounting to £3,854, has been accepted.

The Wigan Branch of the Amalgamated Society of Carpenters and Joiners recently held its annual dinner, when sixty persons were present, the chair being occupied by Mr. William Dixon.

Two Big Fires.—A disastrous fire occurred recently on the premises of Messrs. Spear & King, builders and contractors, Crowthorne, Berks. The damage is estimated at more than £3,000. The fire, however, will not interfere with the contracts the firm have in hand.—A fire recently occurred at the premises of Messrs. A. Scott & Son, joiners and builders, Gilmore Place Lane, Edinburgh, causing damage which is estimated at about £1,000; this, however, is covered by insurance.

Colne Builders' Losses.—At the Burnley Bankruptcy Court recently the first public examination took place of Joseph Hawley & Matthew Hawley, carrying on business at Colne and Bromley Cross, near Bolton, as joiners, builders and contractors. The joint statement of affairs showed gross liabilities amounting to £25,530, of which £23,687 was expected to rank for dividend. The assets were estimated to produce £14,411, leaving a deficiency of £12,286. The firm lost £1,780 on the contract for the building of the Colne Town Hall six years ago.

Plumbers' Registration Bill Read a Second Time.—In the House of Lords last week the Plumbers' Registration Bill was read a second time. The object of the Bill, Lord Glenesk explained, was to establish a system under which plumbers could be registered if they so desired. No privilege, however, would be accorded to registered plumbers, but a plumber could not be registered until he was fully qualified by passing an examination under the direction of the Board of Trade. Lord Kenyon said that as the Bill now stood it cast on the Local Government Board the formation of a scheme which that Board did not want to undertake. If the promoters of the Bill would prepare a scheme and make it part of the Bill, then it could be introduced next year in a complete form.

Fair Contract Question at Bradford.—A joint-committee of the Bradford Trades and Labour Council and representatives of building trades' employees recently convened a mass meeting of ratepayers respecting the action of the corporation in regard to the fair contract clause as bearing upon the local dispute in the building trades. A resolution was carried protesting emphatically "against the action of those aldermen and city councillors who voted in favour of permitting master-builders holding their contracts under the fair contracts resolution of the city council in connection with public works to continue building operations with men receiving less wages than the rates agreed upon between the Employers' Association and the men's unions."

Tall Buildings for London: American Enterprise.—Mr. H. S. Black, president of the George A. Fuller Company, builders, of New York and Chicago, has come to England to treat with Lord Revelstoke and others with regard to the erection of a large number of steel-constructed buildings in London. In an interview Mr. Black said: "I am not an advocate of 'sky-scrapers,' and do not favour buildings of more than ten or twelve storeys in height. The tendency in America is towards architectural anarchy, every man building as he chooses without any regard for the symmetry of a skyline. I believe, however, that the erection of moderately high buildings is advantageous. Commercially, of course, the more room one has to rent the more rent there is to collect. From the philosophical point of view, tall well-constructed buildings, modern and beautiful in every detail, with the swiftest elevators and conveniences of minutest description, must be conducive to general progress in the conduct of business."

Messrs. R. Francis & Sons, of Carrara House, Terminus Place, Eastbourne, have secured the contract for the masonry work in connection with the building of the new Granville Hotel which is to be erected in Sea Road, Bexhill, and is to contain 200 rooms.

A Huge Block of Granite.—One of the largest blocks of granite ever hewn in the county has been safely brought into Penryn Railway Station from the quarries of Messrs. John Freeman, Son & Co. It weighs over 37 tons, and is of oblong shape. Under the supervision of Mr. D. B. Donald Mime (the junior engineer), it was suspended from heavy wooden girders between two trucks and carefully secured, two traction engines bringing it down the steep gradients, around the sharp curve, and up to the station without any mishap. The stone is for the memorial to King Alfred the Great, to be erected at Manchester.

L. C. C. Brickmaking. — The L. C. C. wants 16,000,000 bricks for part of its housing schemes. The Norbury estate in South London contained, when the council bought it for housing purposes, a brickmaker's plant in full swing. Tenders were invited for the 16,000,000 bricks, but it is not likely that the council will accept any of them. On the other hand, the cost of making bricks by direct labour at Norbury is estimated at from 22s. to 27s. per 1,000, whereas the cost of purchasing stock bricks in the market and delivering them at Norbury would not be less than 32s. per 1,000. From three practical brickmakers the Housing Committee have selected one as foreman at a wage of £3 3s. per week, in addition to a bonus should he be able to turn out suitable bricks at not more than 25s. per 1,000. It is expected that under favourable circumstances an output of 3,000,000 bricks a year may be forthcoming.

London County Council.—At last weeks' meeting, on the recommendation of the Highways Committee, it was decided to construct 5½ miles of new tramways at a cost of £175,400, exclusive of £87,800 for street widenings. Of these tramways one will be along the Victoria Embankment, from Westminster Bridge to Blackfriars Bridge. A recommendation for the widening of Hampstead Road at the Euston Road end, involving a nett cost of £225,500, was adopted. On the report of the Housing of the Working Classes Committee dealing with a capital vote of £15,000 for the foundations of two blocks of dwellings on the Reid's brewery site, Mr. R. Williams called attention to the fact that the Council was gradually decreasing the floor-space given in working-class dwellings, and he moved as an amendment: "That the recommendation be referred back to the committee with instructions to so amend the plans for this site that not more than 500 persons to the acre be housed thereon." The amendment was defeated. It was resolved that the Council should enter into a formal contract with the property owners of Marble Hill for the acquisition of their land, so that the view from Richmond Hill might be preserved to the public without disfigurement by the erection of buildings. By the payment of £3,500 the Council secures the option of purchase till December 31st, and it is hoped to arrange a scheme for the purchase by all bodies interested of the land for the sum of £70,000. With respect to the proposed widening of Piccadilly between Hyde Park Corner and Walsingham House, the Improvements Committee informed the Council that a conference had been held with the Secretary of his Majesty's Office of Works, and it was believed it would be possible to save eleven of the existing trees. Replying to Captain Swinton, Mr. Davies said of fifty-seven trees affected by the improvement only eight would be actually cut down. The plans for the new Gaiety Theatre were unanimously passed. The Theatres Committee submitted for approval a new code of regulations under the Metropolis Management and Building Acts Amendments Act, 1878, with respect to the requirements for the protection from fire of theatres, &c., in London. A long discussion took place on this recommendation, but ultimately the regulations were approved.

Keystones.

MM. Dalou and Formigé have been commissioned to execute a monument to Gambetta, and they hope to have it finished in two years.

St. Andrews Parish Church Hall is to be built at a cost of £2,500 from designs by Messrs. Gillespie & Scott, of St. Andrews.

Extensions to St. Bartholomew's School, Ewood, Blackburn, are being carried out by Messrs. Cheers & Smith, architects. Mr. John Boland, of Blackburn, is the builder.

The Building of St. Barnabas Church, Portsmouth, has been commenced. The design is by Sir A. Blomfield & Sons. Messrs. W. & R. Light Brothers, of Landport, are the builders.

Hulme Hall, Port Sunlight, has recently been completed from designs by Messrs. William & Segar Owen, of Warrington. It has a floor space of 15,770 sq. ft. and can seat 1,300 persons. It is for use as a restaurant.

A New Wing to North Ormesby Cottage Hospital has just been completed. The architect was Mr. J. Mitchell Bottomley, and the cost has been £4,500, exclusive of fittings and furniture. Mr. King, of North Ormesby, was the contractor.

A New Church at Worsborough Bridge, near Barnsley, has been erected from designs by Messrs. T. H. & F. Healy, of Bradford. The contractors were Messrs. Hammerton, of Worsborough Dale. The east window is filled with stained glass by Messrs. Powell Brothers, of Leeds.

A New Church at East Kirkby, Nottingham, is being built from the designs of Mr. Louis Ambler, F.R.I.B.A. The building will consist of a nave 78ft. long and 27ft. wide internally, with aisles (merely passages 4ft. wide), a chancel 30ft. long and 21ft. wide, vestries for clergy and choir, with heating chamber under, and bell turrets at the west end.

Competition for United Methodist Free Church and Schools, Westcliff-on-Sea.—The design submitted in this (limited) competition by Messrs. George Baines, F.R.I.B.A., & Reginald Palmer Baines, architects, 5, Clement's Inn, Strand, W.C., have been adopted by the committee, and the first portion of the scheme, including the church vestries, &c., is to be proceeded with at once.

Completion of St. Ninian's Cathedral, Perth.—The extensions of St. Ninian's Cathedral, Perth, which have been in progress for the last three years, are now almost completed, and the new buildings were dedicated last week. When plans were required Mr. Butterfield was still alive, but on account of old age had retired from active work. Accordingly Mr. Pearson, who had co-operated in the building of the choir and transepts of Truro Cathedral, was invited to prepare designs. But, before finally revising them, he too died. His place was taken by his son, Mr. Frank L. Pearson. For the remodelling and the furnishing of the chancel the same style of architecture was adopted as that in which the rest of the structure had already been built; but for the additions — the chapter-house, vestries and cloister — recourse was had to "Jacobean Gothic." The work was carried out by Messrs. Fraser & Morton, Perth, who built the nave in 1890. The removal of the high screen and the addition of the aisles, with the beautiful arches which separate them from the choir, entirely do away with the "contracted" effect complained of by Bishop Wordsworth, and add that sense of spaciousness which ought to mark a cathedral. The bishop's throne, canons' and choir stalls, and pulpit are worthy of being the permanent furnishings of a cathedral. The large window opposite the north-west entrance is being filled with stained glass, at a cost of nearly £500, in memory of the soldiers of the Black Watch who have fallen in the South African war.

ENTRANCE TO UPPER CLOISTER, CHETHAM HOSPITAL, MANCHESTER.

The A.A. Library will be closed from August 1st to September 9th.

At Buckingham Palace and Windsor Castle £60,000 is being spent on sanitary improvements and structural alterations.

Another Block of Forty-five Workmen's Houses at Perth is to be erected at an estimated cost of £6,000.

Loughborough Theatre, built of wood and corrugated iron, was destroyed by fire last week.

The death is announced of Mr. Robert Lofthouse, F.S.I., the senior member of the firm of R. Lofthouse & Sons, of Middlesbrough.

Queen Victoria Memorial Designs to be Exhibited Soon.—Lord Esher states that these designs will be exhibited to the public as soon as the necessary arrangements can be made.

St. Paul's Dome to be Inspected.—The great dome of St. Paul's Cathedral is to be carefully inspected inside and out from top to bottom at an early date.

At King's College, Taunton, on Wednesday last the Bishop of Southampton dedicated the new wing which has just been completed. It consists of a large dormitory to hold thirty beds, boys' library and reading-room, chaplain's and masters' rooms.

The Famous Fresco of the Last Supper, by Leonardo da Vinci, in the refectory of the ex-convent of St. Mary, at Milan, has been so damaged by time, damp and neglect that the Italian Government has decided to have it restored.

The Rathbone Statue, Liverpool.—The statue of Mr. William Rathbone, erected by public subscription in St. John's Garden, Liverpool, was recently unveiled. It is of bronze and is surrounded, in accordance with the design of Mr. G. Frampton, R.A., the sculptor, with a stone seat. The total height of the pedestal and statue is 22½ft.

Interesting Discovery.—The construction of the Rue Dante at Paris has completely revolutionised the quarter through which it passes and has destroyed a large number of old houses. In one of these, situate in the Rue Galande, near the Rue Dante, said to have been inhabited by Gabrielle d'Estrées, the mistress of Henry IV. of France, the workmen have discovered a number of old documents relating to the diplomatic relations between France and Turkey, among which was a copy of a letter from Mehemet, pasha of Egypt, dated 1704.

Excavations at Yamboli.—The French Academy of Incriptions and Belle-lettres have granted a subvention of 2,000f. out of the accumulated funds of the Eugène Piot foundation to Mr. A. Degrand, the French Consul at Philippopolis, for the purpose of continuing the work of excavation at Yamboli (Bulgaria) recently commenced by M. Seurre, a member of the French School at Athens, which have given the happiest results with regard to the pre-historic age and the period of the Roman occupation. The Academy make it a condition that the whole, or at least the greater portion, of the objects discovered shall belong to the French Government.

York Minster and the Vibration of Street Traffic.—The Society for the Protection of Ancient Buildings has addressed a letter to the corporation of York in reference to the scheme for improving the thoroughfares of that city in the immediate vicinity of the minster. The society deputed one of their professional members to visit York, and having considered his report, the committee urge the corporation to take into consideration the "serious question of the almost certain damage caused by vibration if heavy traffic is permitted to approach the minster." The committee state that "there can be no doubt as to the harm caused by vibration to an ancient building," and that "so far back as the time when St. Paul's Cathedral was erected this was understood, and Sir Christopher Wren (one of our greatest authorities on construction) wrote most strongly on the subject." The committee express the hope that whatever scheme may be advocated, it will keep in view the general principle that no heavy traffic ought to pass within 40ft. of the minster.

A New Seamen's Institute at Manchester Docks is being built from designs by Mr. Medland Taylor, architect, Messrs. William Southern & Sons, of Salford, being the builders.

Busby Board School is to be rebuilt according to the plans of Messrs. Watson & Salmond, recently accepted in competition. The work will commence immediately.

Tintern Abbey and Village were taken possession of by the Crown on Wednesday last. The modern outbuildings around the abbey will be removed and the monks' graveyard cleared of fruit trees.

The Leeds and Yorkshire Architectural Society made an excursion to Giggleswick on July 27th to inspect the new chapel now being erected at the Grammar School. The donor is Mr. Walter Morrison, and the architect Mr. T. G. Jackson, R.A. Mr. R. Evans is the clerk of the works.

Denork Mansion House, near St. Andrews, has just undergone extensive alterations and additions. Mr. David Henry, of St. Andrews, was the architect, and Mr. William Ness the builder. Electric light has been installed by Messrs. Lowden Brothers & Co., of Dundee.

The Memorial Window to the late Mr. W. E. Gladstone which the members of the Armenian and Cretan Relief Committee are about to erect in the church of St. Ethelwald, Hawarden, is on view in the studio of the artist, Mr. Frampton, 110, Buckingham Palace Road. Its cost is £300.

The New Workhouse Infirmary, Dorking, has been opened. It was designed by Mr. H. Percy Adams, F.R.I.B.A., and was illustrated in our issue for May 8th last. Messrs. Kerridge & Shaw, of Cambridge, were the builders. The total cost of the building was £10,450.

Cambrian Archæological Association.—The fifty-fifth annual meeting opened at Newtown, Montgomeryshire, on Wednesday last. Interest was lent to this the first visit of the Association to Cedewain by the fact that excavations were recently begun on the site of the old Roman city at Caersws.

Antiquities in Western Prussia.—The excavations in the neighbourhood of Dantzic have been continued with very great success. A number of tombs of the pre-Roman period were discovered at Suckschlin containing urns of considerable size. Some of them are covered with fine ornament.

The New Bluecoat Hospital, at Wavertree, Liverpool, to be erected from the designs of Messrs. Briggs & Wolstenholme, and Messrs. F. B. Hobbs & Arnold Thornely, is, like the existing hospital in School Lane, in the late Renaissance style, which has been adopted with a view to continuity of design. It is to be built of red brick with facings of white stone. The total estimated cost is £90,000. This sum, however, includes the sanatorium, a separate building placed on a terrace to the north of the main hospital, and on the east of the playing field, which the sanatorium overlooks.

A New "Hydro" at Church Stretton, Salop, is four storeys high and contains, on the ground floor, entrance hall and lounge, staircase, hall and lift, dining-room 40ft. by 18ft., drawing-room 28ft. by 18ft. (the two latter rooms opening on to the terrace which forms a pleasant lounge and parade), billiard-room 25ft. by 18ft., recreation-room 42ft. by 18ft., and luxurious Turkish baths and dressing and cooling rooms. On the first floor there are seventeen bed and sitting-rooms, four bathrooms, &c.; on the second floor eighteen bedrooms, bath, &c; and on the third floor ten bedrooms. The hotel has been furnished by Messrs. Maple & Co.

The View from Richmond Hill.—The "Daily Chronicle" says: "Richmond Hill has gained a reprieve rather than a free pardon, and its unrivalled view over the Thames Valley is safe only till the end of the year. . . . From all indications we are sure that London, Surrey, Middlesex, to say nothing of Richmond and Twickenham in especial, are determined to save the famous prospect from desecration, and that when the summer vacation is over the apportioning of expenses will be carried out before the option has expired. We have paid that sum for a single picture in the National Gallery and it is not too much to pay for the picture at Richmond."

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COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Aug. 9	Sale—Tower	Urban District Council	A. G. M'Beath, 2 Montague Road, Sale.
" 9	Wolverhampton—Alterations, &c.	School Board	T. H. Fleeming, 102 Darlington Street, Wolverhampton.
" 9	Worcester—Police Station Buildings	Standing Joint Committee	H. Rowe, County Surveyor, Worcester.
" 9	Saltburn—Completion of House	—	E. Whipham, 59 High Street, Stockton-on-Tees.
" 10	Musselburgh—Municipal Buildings	Town Council	Lyle & Constable, 3 Hill Street, Edinburgh.
" 10	Peterborough—Alterations, &c.	—	J. G. Stallebrass, Architect, North Street, Peterborough.
" 12	Edinburgh—Alterations	Governors of George Heriot's Trust	J. Anderson, 20 York Place, Edinburgh.
" 12	Gravesend—Central Station	Town Council	F. T. Grant, Borough Surveyor, Town Hall, Gravesend.
" 12	Seaham Harbour—Offices, &c.	Sunderland and South Shields Water Co.	W. & T. R. Milburn, 20 Fawcett Street, Sunderland.
" 12	Stirling—Public Library	Committee	R. Whyte, 4 King Street, Stirling.
" 12	Abergavenny—Bridge	Rural District Council	J. Gill, 4 Brecon Road, Abergavenny.
" 12	Hoylake—Stables, &c.	Urban District Council	T. Foster, Engineer, District Council Offices, Hoylake.
" 12	Benwell—School	School Board	W. Thompson, 63 Grey Street, Newcastle-on-Tyne.
" 13	Maindy, near Cardiff—Alterations, &c.	Llandaff School Board	G. E. Halliday, 14 High Street, Cardiff.
" 13	Great Marlow—Alterations, &c.	Great Western Railway Company	G. H. Mills, Secretary, Paddington Station, London, W.
" 13	Burghill, near Hereford—Cottages	Visiting Committee of Lunatic Asylum	A. Dryland, County Surveyor, Shire Hall, Hereford.
" 14	London, S.W.—Superstructure	Commissioners of H.M. Works	A. Webb, 19 Queen Anne's Gate, S.W.
" 14	Mohill, co. Leitrim—New Bank Office and House	Directors of the Northern Banking Co., Ltd.	G. W. Ferguson, Bank, Mohill.
" 15	Redruth—Offices and Stores	S. & T. Kounson	S. Hill, Architect, Green Lane, Redruth.
" 15	Fulham—Additions to Workhouse	Guardians	A. P. Snell, 22 Southampton Buildings, Chancery Lane, W.C.
" 15	Chelmsford—Cottages	Mrs. Irving	F. Whitmore, 17 Duke Street, Chelmsford.
" 16	Low Fields, Ingleton—Residence Stables, &c.	Mr. William Taylor	S. Shaw, Architect, Highgate, Kendal.
" 17	Walton-on-Thames—Stables, &c.	Urban District Council	C. J. Jenkin, Engr. & Surveyor, Council Offices, Walton-on-Thames.
" 19	Pembroke Dock—School	School Board	G. Morgan & Son, 24 King Street, Carmarthen.
" 19	Whitchurch, near Cardiff—School	School Board	R. & S. Williams, Borough Chambers, Wharton Street, Cardiff.
" 19	West Didsbury, Lancs—Caretaker's House	—	J. Cartwright, Peel Chambers, Market Place, Bury.
" 21	Rochester—Shelter	Corporation	W. Banks, City Surveyor, Guildhall, Rochester.
" 21	Batley—Buildings	Corporation	J. C. Barraclough, Waterworks Engineer, Market Place, Batley.
" 24	Nelson—Central Station	Electricity and Tramways Committee	B. Ball, Borough Engineer and Surveyor, Nelson.
" 24	Walsall—Town Hall	Corporation	R. H. Middleton, Borough Engineer, Walsall.
" 27	Sturminster—Infirmary	Guardians of Union	C. Hunt, Architect, The Close, Blandford.
Sept. 16	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.
	ENGINEERING:		
Aug. 9	Clones—Sewage Disposal Works	Urban District Council	J. H. H. Swiney, Avenue Chambers, Belfast.
" 9	Moss Side—Disinfecting Apparatus	Urban District Council	H. B. Longley, Council Offices, Moss Side, Manchester.
" 9	Bristol—Grain Elevator	Docks Committee	W. W. Squire, Engineer's Office, Cumberland Basin, Bristol.
" 9	London, E.C.—Bridges	Bengal-Nagpur Railway Company, Ltd.	Company's Office, 132 Gresham House, London, E.C.
" 10	Wigan—Motors and Starters	Corporation	H. Bishop, Electrical Engineer, Bradford Place, Wigan.
" 10	Leigh, Lancs—Coke Elevator	Gas Committee	J. Foster, Gasworks, Leigh, Lancs.
" 10	Knaresborough—Pump	Urban District Council	S. Turner, Surveyor to the Council, Knaresborough.
" 10	Woolacombe—Reservoir	—	T. Rees, Corn Exchange Chambers, Newport, Mon.
" 10	Hunslet—Settling Tanks, &c.	Rural District Council	C. H. Marriott, Son & Shaw, Dewsbury.
" 10	Shipston-on-Stour—Water Supply	Rural District Council	N. Lailey, 16 Great George Street, Westminster.
" 12	Tyldesley—Steel Tank	Urban District Council	Engineer, Gasworks, Tyldesley.
" 12	Stanford-le-Hope, Essex—Pumping machinery	Orsett Rural District Council	R. F. Grantham, 23 Northumberland Avenue, London, W.C.
" 12	Stanford-le-Hope, Essex—Sewage Disposal Works	Orsett Rural District Council	R. F. Grantham, 23 Northumberland Avenue, London, W.C.
" 12	Farnworth—Traverser	Urban District Council	W. J. Lomax, 11 Fold Street, Bolton.
" 12	Nottingham—Pipe-laying	Water Committee	General Manager, Water Department, St. Peter's Church Side, Nottingham.
" 13	Newport, Mon—Main-laying	Corporation	H. R. Hooper, 16 Quay Street, Newport, Isle of Wight.
" 13	Watford—Sewerage Works	Rural District Council	E. Lailey, 9 Market Street, Watford.
" 13	Fenny Stratford—Sewage Disposal Works	Urban District Council	J. Chadwick, Engineer, Bletchley, Bucks.
" 13	Aberdeen—Sewers, &c.	Town Council	W. Dyack, Burgh Surveyor, Town House, Aberdeen.
" 14	Kettering—Sewers	Urban District Council	T. R. Smith, Surveyor, Market Place, Kettering.
" 15	Ipswich—Reservoir	Waterworks Committee	H. Roberts, Engineer and Surveyor of Waterworks, Ipswich.
" 16	Jassy—Supply of Water to Town	Communal Council	Communal Technical Department, Jassy.
" 20	Sligo—Boiling Pans	District Asylum	Resident Medical Superintendent, District Asylum, Sligo.
" 21	Liverpool—Widening, &c.	S. Lancs Electric Traction and Power Company, Ltd.	Kincaid, Waller & Manville, 29 Gt. George St., Westminster, S.W.
" 21	London, E.C.—Goods Engine	East Indian Railway Company	C. W. Young, Secretary, Nicholas Lane, London, E.C.
" 23	Worcester—Electrical Plant	Corporation	C. J. Sutherland, City Electrical Engineer, Guildhall, Worcester.
" 25	Havana—Sewerage System	Mayor of Havana	Lieutenant W. J. Barden, Chief Engineer, City of Havana.
" 26	Newmarket—Water Supply	Rural District Council	S. J. Ennion, Clerk to the Council, Newmarket.
" 27	Farnham—Electricity	Urban District Council	R. Mason, Clerk to the Council, Farnham,
Sept. 2	Amsterdam—Electrical Tram Carriages and Rails	Municipality	Director of the Municipal Tramways, Nieuwe Achtergracht No. 164, Amsterdam.
" 3	Middlesbrough—Coal-Handling Plant	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, S.W.
Oct. 1	Copenhagen—Bridge	—	Statsbaneaulaegenes Kontor, Reventlowsgade, 10 Copenhagen, B.
" 1	Hadsun Denmark—Bridge	Danish Ministry for Public Works	Statsbaneaulaegenes Kontor, Reventlowsgade, 10 Copenhagen, B.
Dec. 10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.
" 31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
Feb. 28	Sydney, N.S.W.—Bridge	Government of N.S.W.	Under Secretary for Public Works, Sydney.
	IRON AND STEEL:		
Aug. 10	Buxton—Mains	Urban District Council	W. H. Grieves, Town Surveyor, Town Hall, Buxton.
" 10	Hoylake, Cheshire—Railings	West Kirby Urban District Council	T. Foster, Engineer, District Council Offices, Hoylake.
" 12	Nottingham—Pipes	Water Committee	General Manager, Water Department, St. Peter's, Churchside, Nottingham,
" 12	Buxton—Mains	Urban District Council	W. H. Grieves, Town Surveyor, Town Hall, Buxton.
" 12	London, N.—Lamp Columns	Urban District Council	E. J. Lovegrove, Engineer to the Council, Hornsey.
" 12	Stanford-le-Hope, Essex—Pipes	Rural District Council	R. F. Grantham, 23 Northumberland Avenue, London, W.C.
" 13	London, W.—Girders, &c.	Great Western Railway Company	Engineer, Paddington Station, London, W.
" 21	Portsmouth—Iron, &c.	Corporation	Town Hall, Portsmouth.
	PAINTING AND PLUMBING:		
Aug. 9	Salford—Painting, &c., Union Offices	Guardians of the Union	F. Townson, Union Offices, Eccles New Road, Salford.
" 9	Leeds—Painting, &c.	Guardians of Nurses' Home	Poor Law Offices, South Parade, Leeds.
" 12	Manchester—Painting, &c.	Sanitary Committee	City Surveyor, Town Hall, Manchester.
" 14	Maryborough, Ireland—Painting	District Asylum	J. T. Brick, Acting Clerk, Asylum, Maryborough.
" 15	Newhaven—Painting, &c.	Guardians of the Union	Master, Workhouse, Newhaven.
" 21	Portsmouth—Plumbing Work	Corporation	Town Hall, Portsmouth.
	ROADS AND CARTAGE:		
Aug. 9	Omagh, Ireland—Road Maintenance	Rural District Council	W. Cathcart, Clerk, Board Room, Workhouse, Omagh.
" 10	Leeds—Paving, &c.	—	City Engineer's Office, Municipal Buildings, Leeds.
" 10	Stockton-on-Tees—Improvement Works	Corporation	M. H. Sykes, Borough Engineer, Town Hall, Stockton-on-Tees.
" 10	Standish—Street Works	Urban District Council	Heaton, Ralph & Heaton, Architects & Surveyors, King St., Wigan.
" 14	Stamford—Footway, &c.	Town Council	Borough Surveyor, 15 Barn Hill, Stamford.
" 15	Eastbourne—Road	Town Council	Borough Engineer's Office, Town Hall, Eastbourne.
" 19	Garston, Lancs—Materials	Urban District Council	District Surveyor, Public Offices, Grassendale, West Liverpool.
" 21	South Mims—Granite, &c.	Rural District Council	G. D. Byfield, 16 High Street, Barnet.
" 21	Portsmouth—Gravel, Sand, &c.	Corporation	Town Hall, Portsmouth.
" 31	Bromley, Kent—Materials	Rural District Council	E. Hazlehurst, 98 High Street, Bromley, Kent.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		SANITARY		
Aug.	10	Bingley, Yorks—Sanitary Pipes	Urban District Council	H. Bottomley, Surveyor, Town Hall, Bingley.
„	12	Rugby—Drainage Works	Guardians of Workhouse	T. W. Willard, Surveyor, Rugby.
„	12	Darfield, Barnsley—Sewerage Works	Urban District Council	Council's Surveyor's Office, The Poplars, Darfield.
„	19	Spennymoor—Sewerage Works	Urban District Council	W. Curry, Silver Street, Spennymoor.
„	21	Glasgow—Sewer	Corporation	City Engineer, City Chambers, 64 Cockrane Street, Glasgow.
„	21	Portsmouth—Cement	Corporation	Town Hall, Portsmouth.
Sept.	2	Cleland and Omoa, Scotland—Sewer Works	District Committee of Middle Ward	W. L. Douglass, 3 Clydesdale Street, Hamilton.
		TIMBER:		
Aug.	21	Portsmouth—Timber	Corporation	Town Hall, Portsmouth.

COMPETITIONS OPEN.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Aug.	31	Sheffield—Alteration of Ecclesall Church	—	Rev. T. Houghton, Ecclesall Vicarage, Sheffield.
Sept.	16	Blackpool—Laying-out Land	£30, £15 and £5	Borough Surveyor, Town Hall, Blackpool.
Oct.	1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
„	29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.
No date		Walton-on-Thames—Municipal Buildings, Fire Station and Surveyor's Residence.	30, 20 and 10 guineas respectively.	P. H. Webb, Clerk to the Council, Walton-on-Thames.
No date		Cardiff—Chapel	£5,000	T. Evans, 102 Cathedral Road, Cardiff.

New Companies.

Dale & Kemp, Ltd.

Registered July 20th to acquire the business carried on at 48A, Camden Street, Birmingham, to adopt an agreement with I. Dale and W. Kemp, and to carry on the business of shop-front builders, shop, office and bar fitters, showcase makers, dealers in glass and china, decorators, gas-fitters, brassfounders, upholsterers, &c. Capital £3,500 in £1 shares (1,500 preference). Registered office: 48A, Camden Street, Birmingham.

Hamor Lockwood & Co., Ltd.

Registered July 20th to take over the business carried on by Hamor Lockwood at Manchester and elsewhere as Hamor Lockwood & H. Lockwood & Co., and to carry on the business of manufacturing chemists and druggists, cement, concrete and asphalt manufacturers, manufacturers of products of coal tar, contractors, engineers, metal, stone and wood workers, builders, general paviors, &c. Capital £40,000 in £1 shares. The first directors are H. Lockwood, W. R. Bootland and F. Foster. Registered office: 49, Blackfriars Street, Manchester.

Severn Buildings, Ltd.

Registered on July 22nd to adopt an agreement for the acquisition of certain land in Severn Street and John Bright Street, Birmingham, to develop and turn to account the same, and generally to carry on the business of builders, contractors, &c. Capital £2,500 in £100 shares. The first directors are F. Taylor and F. Kenwick. Registered office: 33, Newhall Street, Birmingham.

Precision Engineering Co., Ltd.

Registered July 23rd. Capital £2,000 in £1 shares.

Runcorn White Lead Co., Ltd.

Registered July 25th to adopt an agreement with J. E. W. Carlton and F. D. Hessey relating to the business of dealers in white lead, &c. Capital £90,000 in £1 shares.

Henry Williamson & Co., Ltd.

Registered July 25th to acquire the business of H. Williamson & Co. at Hull, Newport, Broomfleet Landing, Goole and Selby, in the county of York, and to carry on the business of brick and tile manufacturers, &c. Capital £30,000 in £10 shares. Registered office: North Side, Queen's Dock, Hull.

Anchor China-Clay Syndicate, Ltd.

Registered July 25th for the acquisition of the Archer Clayworks, and to carry on the business of china-clay makers, cement manufacturers, &c. Capital £12,000 in £10 shares. Registered office: Blomfield House, London Wall, E.C.

Selly Oak Estates Co., Ltd.

Registered July 26th to adopt an agreement with E. A. Olivieri, to deal in and with any land, house or other property, and to carry on the business of masons, bricklayers, &c. Capital £10,000 in £1 shares. Registered office: 5, Corporation Street, Birmingham.

CURRENT PRICES.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	8	6		—	
Clover, best	per load	4	5	0	5	10	0
Hay, best	do.	4	15	0	5	5	0
Sainfoin mixture	do.	4	5	0	5	2	6
Straw	do.	1	8	0	1	18	0

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French	per cwt.	1	8	3		—	
Colza Oil, English	do.	1	8	6		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	2	4	6		—	
Lead, white, ground, carbonate	do.	1	4	10		—	
Do. red	do.	1	0	$4\frac{1}{2}$		—	
Linseed Oil, barrels	do.	1	11	9	1	12	0
Petroleum, American	per gal.	0	0	$5\frac{5}{8}$	0	0	$5\frac{3}{4}$
Do. Russian	do.	0	0	$4\frac{1}{8}$		—	
Pitch	per barrel	0	7	6		—	
Shellac, orange	per cwt.	3	1	6		—	
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Home Melt	per cwt.	1	5	3	1	5	6
Tar, Stockholm	per barrel	1	6	6		—	
Turpentine	per cwt.	1	5	$10\frac{1}{2}$		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong	per ton	83	0	0		—	
Iron, Staffs., bar	do.	6	7	6	8	10	0
Do. Galvanised Corrugated sheet	do.	11	5	0	11	10	0
Lead, pig, Spanish	do.	11	16	3		—	
Do. do. English common brands	do.	12	2	6		—	
Do. sheet, English, 3lb. per sq. ft. and upwards	do.	17	9	0		—	
Do. pipe	do.	18	3	0		—	
Nails, cut clasp, 3in. to 6in.	do.	12	0	0	13	5	0
Do. floor brads	do.	11	15	0	12	15	0
Steel, Staffs., Girders and Angles	per ton	5	15	0	6	15	0
Do. Mild Bars	do.	6	15	0	7	1	0
Tin, Foreign	do.	116	0	0	116	10	0
Do. English ingots	do.	130	0	0		—	
Zinc, sheets, Silesian	do.	22	0	0		—	
Do. do. Vieille Montaigne	do.	22	10	0		—	
Do. Spelter	do.	16	12	6	17	0	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load	3	0	0	4	0	0
Pine, Quebec Yellow	do.	4	7	6	6	0	0
Do. Pitch	per load	2	9	0	3	0	0
Laths, log, Dantzic	per fath.	4	10	0	5	10	0
Do. Petersburg	per bundle	0	0	9	0	0	$10\frac{1}{2}$
Deals, Archangel 2nd & 1st	per P.Std.	8	5	0	11	15	0
Do. do. 4th & 3rd	do.	8	0	0		—	
Do. do. unsorted	do.		—			—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	21	0	0		—	
Do. do. 2nd „	do.	19	0	0		—	
Do. do. unsorted	do.	11	0	0		—	
Do. do. White	do.	9	10	0	11	5	0
Do. Swedish	do.	9	10	0	18	0	0
Do. White Sea	do.	9	15	0	13	0	0
Do. Quebec Pine, 1st	do.	22	0	0	23	0	0
Do. do. 2nd	do.	19	15	0		—	
Do. do. 3rd &c.	do.	13	10	0		—	
Do. Canadian Spruce, 1st	do.	12	5	0		—	
Do. do. 3rd & 2nd	do.	9	5	0	10	0	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	[illegible]	0	0	9	0	0
Flooring Boards, 1in. prepared, 1st	per square	0	11	6	0	13	6
Do. 2nd	do.	0	9	6		—	
Do. 3rd &c.	do.	0	6	9	0	7	3

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba	per ft. sup.	0	0	$4\frac{5}{32}$		—	
Do. Honduras	do.	0	0	$3\frac{21}{32}$		—	
Do. Tobasco	do.	0	0	4		—	
Elm, Quebec	per load	0	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	$4\frac{5}{8}$		—	
Do. African	do.	0	0	$2\frac{29}{32}$		—	
Do. St. Domingo	do.	0	0	$6\frac{3}{8}$		—	
Do. Tobasco	do.	0	0	$3\frac{7}{32}$		—	
Do. Cuba	do.	0	0	$4\frac{29}{32}$	0	0	$3\frac{13}{16}$
Oak, Dantzic and Memel	per load	3	15	0	5	7	6
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks	do.	6	0	0	17	10	0
Wainscot, Riga (Baulk)	do.	3	15	0	5	15	0
Do. Odessa Crown	do.	3	15	0	5	15	0
Walnut, American	per cub. ft.	0	3	1		—	

COMING EVENTS.

Saturday, August 10.

ARCHITECTURAL ASSOCIATION.—Fourth Summer Visit, to Syon House, Isleworth.

Saturday, August 10, to Saturday, August 17.

INSTITUTION OF JUNIOR ENGINEERS.—Summer Excursion to Plymouth and Devonport.

Saturday, August 24.

ARCHITECTURAL ASSOCIATION.—Fifth Summer Visit, to the Presbyterian College, Cambridge.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to South Shields.

Saturday, August 31.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.

Tuesday, September 3, to Friday, September 6.

IRON AND STEEL INSTITUTE.—Autumn Meeting at Glasgow.

Saturday, September 7.

ARCHITECTURAL ASSOCIATION.—Sixth Summer Visit, to Wakehurst Manor, Ardingly, Sussex.

TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

BANGOR.—For alteration to "Old George and Dragon." Mr. W. G. Williams, architect, 220, High Street, Bangor:—

William Parry, Jnr.	£730	0
Isaac Evans†	547	0
R. & J. Williams	527	0
Watkin Jones	498	0
W. Hughes Bethesda	460	0
Jones & Evans	*455	17

* Menai Bridge
† Recommended for acceptance.

BARNSTAPLE.—For additions, &c., to the "Royal and Fortescue" Hotel, for Mr. Jones. Mr. Arnold Thorne, architect, 16, Cross Street, Barnstaple:—

Sanders & Karslake	£2,220	10
Bryant & Thorne	2,181	0
W. Slee	2,015	0
Woolway & Sons	1,961	0
Barwick & Sillifant	1,953	0
H. Burgess	1,895	0
Tucker & Sillifant,* Vicarage Lawn	1,870	0

* Accepted.

BRISTOL.—For the completion of the church of St. Thomas, Eastville. Mr. H. C. M. Hirst, architect, 30, Broad Street, Bristol:—

W. Church	£5,828	C. A. Hayes	£5,157
M. Darnford	5,740	R. F. Ridd	5,097
F. G. Love	5,650	E. Walters	5,066
Daltry & Son	5,583	R. Wilkins & Sons	4,888
E. Love	5,360	E. Clark	4,798

[All of Bristol.]

BUCKNALL (STAFFS).—For the erection of covered ways at the infectious diseases hospital for the Henley, Stoke and Fenton Joint Hospital Board. Mr. Elijah Jones, M.S.A., architect, 10 Albion Street, Hanley:—

Brain & Smith, Longton	£2,100
H. P. Embrey & Co., Fenton	1,965
C. Cornes & Son, Hanley	1,925
T. Godwin, Hanley	1,901
J. Bagnall,* Fenton	1,855

* Accepted.

CATERHAM (SURREY).—For extending the laundry at Caterham Asylum, for the Metropolitan Asylums Board:—

Builder's work (including extra for "Crystopal" dado).

Foster Bros., Norwood Junction	£3,858	0	0
B. E. Nightingale, Albert Embankment	3,364	0	0
Veale & Carter, Brixton Hill	3,034	17	0
C. R. Roberts, Redhill	3,020	0	0
E. Wall, Tooting, S.W.*	2,705	19	5

* Accepted.

COLCHESTER.—For the erection of Freemasons' Hall, Abbeygate Street. Mr. C. E. Butcher, architect, 3 Queen Street, Colchester:—

Harris & Row	£2,494	W. Chambers	£2,189
J. Grimes	2,400	Dobson & Sons	2,180
A. E. Diss	2,300	T. J. Ward	2,165
H. Myall	2,279	R. Beaumont	2,117
A. Diss	2,250	J. McKay	2,095
Drysart & Co.	2,247	Everett & Son,* Colchester	2,050
E. West	2,229		

* Accepted.

CONWAY.—For the erection of new dining-hall and laundry, and additions and alterations to existing infirmary, Bangor Road, for the Guardians. Mr. T. B. Farrington, architect and surveyor, Trinity Square, Llandudno:—

E. Owen, Llandudno	£4,820	10
J. Payne, Llandudno	4,681	0
D. Ellis, Llandudno	4,230	6
J. & R. Williams, Upper Bangor	4,153	0
W. Hughes, Conway	4,051	10
E. Roberts, Conway	3,895	0
D. Jones and H. Hughes,* Conway and Llandudno	3,854	0

* Accepted.

EDINBURGH—For the extension of the public library for the Corporation. Mr. Williamson, architect. Accepted tenders:—

Kinnear, Moodie & Co., masons	£3,469	17	4
C. Macandrew, joiner	1,368	0	0
Redpath, Brown & Co., smiths	960	0	0

EXETER.—For the erection of electricity station buildings, for the City Council:—

C. Brealey	£27,096	5	10
B. Cooke & Co., London	23,895	0	0
A. N. Cole, Stonehouse	18,927	0	0
R. F. Ridd, Bristol	18,300	0	0
A. Krauss, Bristol	17,000	0	0
W. Cowlin & Sons, Bristol	16,900	0	0
W. Gibson	16,000	0	0
Woodman & Son	15,979	0	0
Mingo & Boon	15,818	0	0
G. Herbert	15,432	0	0
Horn & Passmore	15,405	0	0
Westcott, Austin, & White	14,344	0	0
Stephens & Son	13,990	0	0
W. Brealy	13,905	0	0

[Rest of Exeter].

HAYWARD'S HEATH (SUSSEX).—For the erection of offices and buildings, Boltro Road, for the Cuckfield Rural District Council. Mr. A. R. Pannett, architect, Hayward's Heath. Quantities by Mr. C. A. Kennett:—

J. Pickard	£7,356
W. Wallis	5,894
P. Jenkins	5,458
Field & Co.	5,443
T. White	5,357
Anscombe & Hedgecock	5,310
J. Finch	5,250
S. Knight	5,204
Peerless, Dennis, & Co.	5,189

[Architect's estimate, £5,300.]

HEANOR (DERBYSHIRE).—For the erection of a pair of villas in Minday Street, for Mr. E. Hart. Messrs. Geo. Haslam, M.S.A., & Son, architects, Ilkeston:—

W. Trauter	£986	0	0
Thomas Hallam	983	12	6
K. Earnshaw	913	9	8
W. Brough*	857	16	9

* Accepted.

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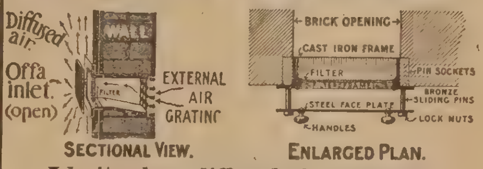

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J. Willmott & Sons	2,839	0
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G. S. S. Williams & Son	2,502	0
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LONDON, S.W.—For halls and other improvements at the Stockwell Road School, for the London School Board. Mr. T. J. Bailey, architect :—

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G. S. S. Williams & Son	13,958
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MERTHYR TYDFIL.—For the erection of new school buildings to the Wesleyan Church, Pontmorlais. Messrs. Williams & Jones, architects, Morgantown, Merthyr Tydfil :—

J. Jones, Glanynant	£1,085	10	0
Richard Lloyd, Georgetown	959	4	11
J. Jenkins	960	0	0
J. Williams, Castle Street	899	10	0
Samuel Hawkins*	882	16	6

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MERTHYR TYDFIL.—For building additions to Abercanaid Board School, for the Merthyr Tydfil School Board. Messrs. Williams & Jones, architects, Morgantown, Merthyr Tydfil :—

John Williams & Sons	£1,782
Samuel Hawkins	1,466
John Lloyd*	1,445

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NEWCASTLE.—For the erection of a Wesleyan Methodist church-school at Rowlands Gill. Mr. F. R. N. Haswell, architect, 77 Tyne Street, North Shields :—

R. Smith	£2,620	0	0
Davison & Bolam	2,517	2	8
A. Armstrong	2,507	0	0
T. A. Turnbull	2,416	2	7
Turner Brothers	2,121	15	9

PETERBOROUGH.—For the erection of Mr. R. Biggadike's house, Oundle Road. Mr. William Boyer, M.S.A., architect, 10A Cowgate, Peterborough :—

F. W. Cauldwell	£570	0
J. Guttridge	498	19
G. Brown	496	0

F. Bailey	455	0
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R. J. Nichols	439	0
F. Collison	435	10
J. Bridgefoot & Son	435	10
M. Darus	435	0
G. A. Nichols	432	0
Thurley Bros.	430	0
J. Lucas	425	0
D. Gray*	398	10

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David Richards	1,500	0	0
R. Farr	1,476	8	6
Jenkins & Son*	1,475	0	0

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W. Peachey	£822
Kemp & Sons	816
W. E. Lewis	799
W. P. & C. Lewis, Hereford*	746

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TIVERTON (DEVON).—For the erection of Elmore Mission Church. Mr. W. E. Williams, architect, 53 St. Peter Street, Tiverton. Quantities supplied :—

J. Holcombe, Tiverton	£627	10
W. Loosemore, Tiverton	615	0
John Grater & Sons, Tiverton	598	0
S. Ellis & Sons, North Tawton	590	0
S. Manning, Tiverton	571	0
Richard Grater & Sons,* Tiverton	485	0

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TREALAW (RHONDDA).—For the erection of seven houses. Mr. E. Jones, architect, Porth :—

D. Evans	£1,783	5
W. J. Bartlett*	1,400	0

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WREXHAM.—For the erection of schools for the Governors, Mr. J. H. Phillips, architect, Olive Chambers, Windsor Place, Cardiff :—

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Davies Bros.	9,981	14	0
J. Hughes	9,900	0	0
Gethin & Co.	9,725	0	0
Lewis Bros.	9,585	0	0
E. H. Nicholas	9,470	17	3
W. E. Samuel,* Wrexham	9,425	0	0

* Accepted.

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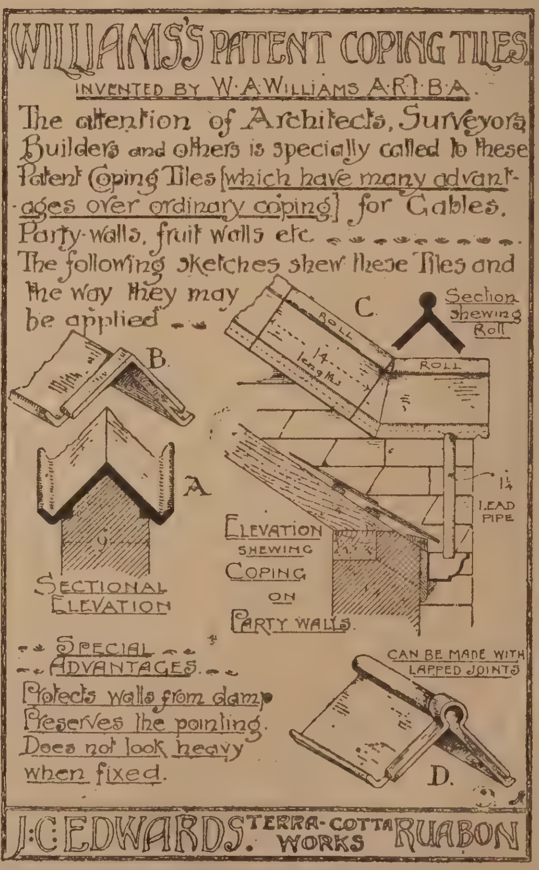

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AUG. 14, 1901.
NO. CCCXL.

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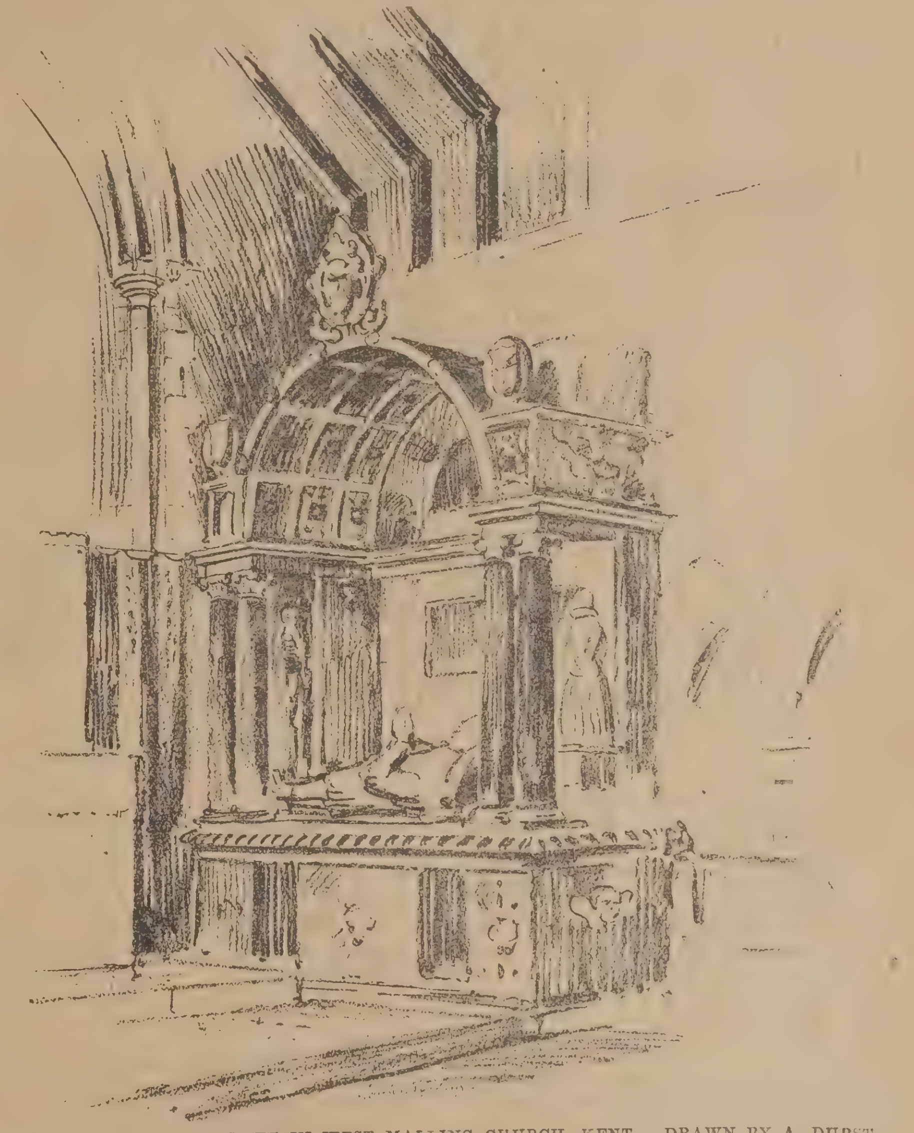
Door and Conservatory Glass. ANYONE with a feeling for colour must have noticed with dismay the atrociously-coloured glass which one sees so often in hall doors and conservatory windows. We refer of course to those panes of intensely red and blue glass, so commonly fixed at the sides of the window panes, which, when the light comes through them, give a ghastly aspect to everything within their range. It will readily be appreciated that violent colours like these cannot properly be used in large sheets or strips, and as this fact is so glaringly apparent by reason of the countless examples furnished by suburban villas and cheap town houses, it is all the more surprising that the practice to which we refer should persist. Intense colour which is near the eye can only be used in small pieces, such as one finds in good stained glass. If it is desired to relieve the white glass in a hall door or a conservatory window, why not insert a lightly-tinted pane of, say, green or pink? It costs less and the effect is pleasing. Would that the offenders might recognise their bad taste in the choice of glass!

Sir Robert Brett's Monument. REFERRING to the drawing on this page by Mr. A. Durst, in the church of West Malling, Kent, in the south-east corner of the chancel, is the monument to Sir Robert Brett, of the county of Somerset, his wife and only son, Henry, who died in 1609, a few years before his parents. The monument is constructed almost entirely of alabaster, except the black marble columns and other marbles used as inlay.

Wanted, a New Thoroughfare. IT is no new and no solitary cry that heads these following words. New ways are in request everywhere for a traffic that increases by leaps and bounds, while our governing bodies in leisurely fashion discuss prejudices and ways and means. There seems to be no possible overtaking of this huge increase, for by the time new thoroughfares are completed, or old ones widened, it has always seemed to be in the last and immovable state of congestion, and the opening of those new, but too-long-considered channels, has merely meant that the business of every-day life can with care be made to proceed. It is only, however, at a snail's pace that the mingled throng of omnibuses, railway lorries, tradesmen's carts, hand-barrows, cabs and private carriages progresses, and by the slow pace only possible helps to prolong the block, and waste time precious to all classes. It is not a new thoroughfare, but a plurality of such that is wanted; but a little experience, conjoined with a little reflection, has convinced the present writer that one such new artery in one quarter of London at least, could readily be brought about, and at small cost in cash, time, and labour. Every Londoner is well acquainted with the great increase in recent years of traffic in the west of the metropolis. There are those of us who can well recollect Knightsbridge, Kensington Gore, and Hammersmith as places comparatively rural; but by this year of grace their crowded condition has become very marked, and that always difficult and dangerous passage—the narrow gut of High Street, Kensington—is chronically blocked. For certainly twelve years past, schemes in which the late Kensington Vestry, the old Metropolitan Board of Works, and the present London County Council have been interested have been drawn up, by which a widening of this altogether inadequate thoroughfare has long been contemplated, and it is understood that a plan is even now pigeon-holed for eventual execution whenever the Council and the Borough of Kensington can agree upon the proportions of their respective contributions to the cost. The thing is necessary, nay, urgent, but it does not suffice to widen a thoroughfare. If possible an alternative one should be provided, and in this case the alternative is readily to hand. This is nothing less than the putting to some real use of the long stretch of Cromwell Road, a road of splendid width, which has never been of more than local convenience, and is much too broad for the traffic that now finds its way along it to what is practically the cul-de-sac of its western end. Cromwell Road, to which a fine entrance leads from Knightsbridge, along the Brompton Road, and so past the South Kensington and Natural History Museums, is surely destined, sooner or later, to be a main thoroughfare. That it should be sooner is devoutly to be wished; but before that consummation can be brought about it is necessary that the district between its western end, at the junction with the Earl's Court Road and Addison Road railway bridge, should be remodelled, and, instead of the mean and altogether inadequate West Cromwell Road continuing in a south-westerly direction to Warwick Road, a new extension be engineered through to Addison Road bridge or Avonmore Road, where the existing Hammersmith Road would be met. Such a suggested thoroughfare would cut across Cromwell Crescent, Warwick Gardens and Warwick Road only, and would relieve High Street, Kensington, of half the intolerable pressure it now suffers. It is true that this would bring more traffic to Brompton Road, which is already well filled, but for three-quarters of the length of that artery there remains on one side a strip of foot-pavement which, occupying the site, as it does, of forecourts and gardens swept away many years since, remains at least twice the width necessary for the comfort and convenience of pedestrians. This might with advantage be thrown into the roadway.

C. G. H.



TOMB OF SIR ROBERT BRETT IN WEST MALLING CHURCH, KENT. DRAWN BY A. DURST.

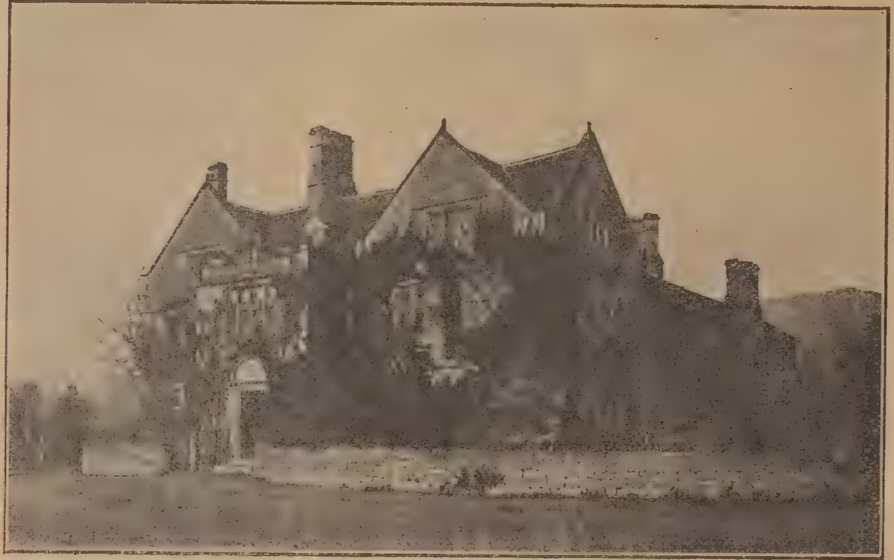
IN THE VICINITY OF HADDON.

BY F. H. CHEETHAM.

WITHIN easy walking distance of Haddon Hall are one or two buildings of more than average interest that architectural students visiting the old manor-house of the Rutlands would do well to see. I refer to places situated within two miles of Haddon itself, a distance which in these days of bicycles is little more than the proverbial "stone's throw" of more remote days.

Haddon itself is usually approached either from Bakewell or Rowsley, between whose railway stations it is nearly equi-distant, and at both these places are examples of old Renaissance houses that find few words of description in any guide-book. Nearly everybody has heard of the Peacock Inn at Rowsley, but comparatively few people know anything of its history. But before we speak of the Peacock, beloved of artists and anglers, let us look first at the old Hall at Bakewell, a building far less known and of whose existence, perhaps, not one in a thousand visitors to the town is aware.

Bakewell itself has been described, and not without reason, as the most pleasantly situated town in Derbyshire, "just the kind of place to which a tourist likes to return for his night's repose." It possesses a church that is well worth seeing, but which, being admirably described in a local sixpenny guide, need not be referred to at length here.



THE PEACOCK INN, ROWSLEY.

The old Hall, however, as far as I know, is not mentioned in any local guide-book. Being a private residence, it cannot of course be visited as a show place, but some reference to it would surely be welcomed by many visitors whose attention would thus be drawn to a most picturesque old English house. It was built in 1686 by one Thomas Bagshawe, a barrister of repute in his day, and for many years legal adviser of the Rutland family, the owners of Haddon. It is the oldest house in Bakewell, and stands on the hillside to the north-east of the church. The late Duchess of Rutland used to describe it as "a miniature Haddon," but the comparison is not at all happy, as the Bakewell house possesses few of the characteristics of the larger mansion. It is one of those quiet English Renaissance houses with gables and balls and balustraded parapets. Their gabled roofs are the characteristic feature of such houses, and these at Haddon are nearly entirely absent. Standing on the side of a steep hill, the square garden in front of the house is built up high from the ground with picturesque effect. Constructed with a warm stone which has weathered a beautiful colour, with its quaint lead heads and its many balled gables, the old Hall is certainly worth finding out when you are in Bakewell. It is rather difficult to discover, however, from written directions, but as you enter the town from the Buxton side, by Mill Street, it lies above you on the right, almost immediately opposite the end of Bath Street, which is the street behind the Town Hall. Indeed, walking along Bath Street with your back to the river you have but to raise your head and there is the old Hall in front of you. But if you are not looking for it you would never think of raising your head.

There is a very good local guide-book called "A Day in the Peak" which gives a full account of Bakewell Church. The church stands on high ground, and the view from the churchyard down the Wye Valley is exceedingly fine. Parts of the structure, the nave and aisles and choir, are old, but the transepts and the tower and spire were built about sixty years ago, and the result is a rather lifeless reproduction of the formerly existing design. The monuments in the Vernon chapel are worthy of notice, and the modern work in the chancel is very good. On the miserere seat of the south stall under the tower the carver has represented a legend that may some day puzzle an enquiring tourist. It is a representation of three somewhat decayed teeth with a cow beneath. The meaning is "Three Acres and a Cow," a phrase much in vogue at the time the carving was executed, but now almost forgotten.

There is an interesting font, the interpretation of the figures on which causes authorities to differ, and an almost unsurpassed collection of ancient sepulchral slabs, most of which were discovered in the foundations at the time of the rebuilding of 1841. They are now in the south porch. Outside the east wall of the south transept stands a fine pre-Norman cross in splendid preservation, but which, owing to the depravity of a tourist some years ago, has lately been surrounded by a heavy cast-iron railing.

There is of course a full account of Bakewell Church in Cox's "Churches of Derbyshire." It possesses the rather unusual feature of two east windows in the chancel.

Just outside Bakewell on the road to Haddon, on the hillside to your right, is a modern house —Burton Closes—built by Augustus Welby Pugin. It has since been added to, however.

The Peacock Inn at Rowsley, our other Renaissance house, does not need any description. It is of the same character as the Hall at Bakewell, but has the additional feature of a large projecting porch, with porch-chamber over. It is earlier in date than the Bakewell house, having been built in 1652, and has more Gothic feeling about it, battlements not having here made way for the balustraded parapet. Over the entrance door on a semicircular stone tympanum are the words—

16 IOHNSTE 52
VENSON

The diagonal lines of the N's are wrongly placed, and the inscription has given rise to some conjecture as to who this John Stevenson was. The guide-books are curiously silent about the history of The Peacock, although they naturally never fail to sing its picturesque charms. Some of them tell us that Stevenson was a former "Boniface" here, which is a purely imaginary statement. The following particulars concerning the inn at Rowsley will therefore, I hope, be of some interest, as being very little known.

John Stevenson, who built the house in 1652, was a member of an old Derbyshire family, who in the reign of Elizabeth were lords of the manor of Elton, close to Rowsley. The building was, therefore, in the first instance a gentleman's residence. It passed from the Stevensons by marriage, and was afterwards occupied by gentlemen farmers as tenants. The last of these tenant-farmers left the house in 1828, when it it was converted into an inn. There is no trace of the building having had any connection with Haddon Hall or the Rutland family, and we may infer that the peacock (the crest of the Rutlands) was not placed in its present position over the porch until the place became an inn. Before 1828 there used to be a garden in front of the house, which now is open to the road, and the present stables and tap room are subsequent additions, the old farm buildings belonging to the residence having been destroyed. The Peacock is a structure of considerable architectural merit and character. The placing of the windows out of the centre line of the gable is what no modern architect would allow himself to do, but it is surprising how little noticeable it is.

Just two miles south-west of Haddon is Youlgreave, a lonely village with a very fine church which is worth a little trouble in getting there to see. The tower, a particularly fine and massive specimen of early fifteenth-century work, is a noticeable object in the country for miles around. The church itself, though it presents a bold and uniform appearance on a general view, will be found to comprise a most interesting complexity of styles from Norman to seventeenth century. In many respects Youlgreave is the most satisfying of the many interesting churches in this part of Derbyshire. The original nave retains its Norman piers and capitals, which on one side support round, on the other pointed, arches. The nave was extended westward in the fifteenth century, but not the aisles, and the tower was added on to this. The effect of this extended nave and tower (which is open to the church) is very fine, especially when viewed from under the tower itself, the floor of which is raised above the level of that of the church. The font is one of the most remarkable in England, and is of twelfth-century date. On one side projects a stoup, or small hollowed receptacle which probably served for holy water, though other explanations of its use are offered: that it was, for instance, for holding the chrism, or holy oil, at baptism.

The church was restored in 1870 by Norman Shaw, and is generally admitted as "a model of what restoration should be." The east chancel window, of five lights, contains some splendid glass by Morris, from the designs of Burne-Jones. The figure of Christ as King fills the centre light, and the others are occupied by the four Evangelists. The beauty of the window, great in itself, seems to be enhanced by its setting, the interior of Youlgreave Church being free from all fussiness, pettiness of detail, or any distracting element whatsoever. It is said that this window was the last work of Messrs. Morris (1876) "before the firm decided to cease from supplying windows for old churches."

The numerous stone bridges in this part of Derbyshire are worthy of some attention, and a collection of measured drawings showing different types would not be without its value. They nearly all have the projecting breakwater between the arches, but in some cases this stops short before the roadway is reached. More often, however, it is carried up to the parapet, forming a triangular recess for foot passengers. The bridge over the Wye at Bakewell is one of the happiest examples of these Derbyshire bridges, and is one of the best known. The bridge at Haddon was built in 1663, and in the steward's accounts at the Hall occurs this entry under date of August 10th of that year: "Paid to John Milner and Charles Hadfield at several times for making the new stone bridge at Haddon, being hired by the great, with what my honourable Lady was pleased to give them in all, £97." "Hired by the great" means to work by measure, as distinguished from work done by day. Rowsley bridge was originally only a packhorse bridge. It was subsequently widened, as may be seen from below by the lateral extensions that were made to the arches.

Apart, therefore, from its natural beauties, the country in the immediate vicinity of Haddon Hall is full of interest; and if the architectural student is a bit of an archæologist as well the district will be a happy hunting ground for him. At any rate, by those who go to measure and sketch at Haddon an extra day may well be spent in visiting some of the old buildings in the neighbourhood.

REPAIRING ST. MARY'S HALL, COVENTRY.

NOT "RESTORATION."

A SHORT time ago the Society for the Protection of Ancient Buildings having learned that certain works of repair were being carried out at St. Mary's Hall, Coventry, expressed a desire for information as to the works in question. The chairman of the Estates and Finance Committee (Alderman Tomson) thereupon intimated to the society that if they would send a representative to Coventry he would be happy to show him the works and explain what was being done. Two representatives, Messrs. Oliver Baker and C. E. Bateman, accordingly visited the hall a short time ago. They make the following report to their committee :—

"In the ancient kitchen, at the south end of the main building, which was probably the original hall of the Guild, a corbel, once one of the roof timbers, having perished, another of white stone has been inserted. This new corbel has been carved to represent a grotesque head with conventional foliage, copied from one in another part of the building. This carving seems to us unfortunate, as, so far as we noticed, the rest of this exceedingly interesting old room is genuine old work, or frankly modern arrangements for cooking, and it would have been better to put in a plain corbel, such as was needed to carry the old post simply as a piece of repair, grotesque heads having no meaning to us of these days, and copies being valueless. The above seems to be the only piece which could be called 'restorative,' the other work now in progress or contemplated being simply undertaken to sustain and uphold those parts of the building which are giving way.

"The little quadrangle, which is entered under a groined archway from the street, has two of its sides bounded by buildings of half-timber work, and in that on the south side the uppermost storey hangs over the lower, and is built of oak framing filled with panelling and enriched externally with cusped arches, above which light tracery is pierced and glazed for windows. The roof of this part is covered with lead, and the timbers are visible in the uppermost room, united with oak boards to form a ceiling with flat top and sloping sides. The whole of this upper storey has fallen forward towards the quadrangle and actually leans against the last of the great buttresses of the hall. It is in other respects in fair condition, considering its age and the slightness of its construction. At either end of the upper chamber are thick walls, and from wall to wall an iron girder has been placed along the bottom of the inside of the wall facing the quadrangle, so as to take the weight and prevent the subsidence increasing. The girder is to be covered by a desk.

BAKEWELL CHURCH FROM THE SOUTH-WEST.

"We learnt in conversation that the advice of architects and archæologists who have expressed opinions on the subject has been against this plan of supporting the building as it is, and in favour of taking down this part of the fabric as a preliminary to its thorough restoration. We, on the other hand, record our firm conviction that such a building as this cannot be taken down without great and irreparable loss to its old character and genuineness as a piece of fourteenth-century architecture. Its original workmanship and its present condition are such that while with care and attention it is capable of enduring for a great many years, much of it would have to be replaced with new work when once taken to pieces. We think the present plan of supporting it with girders an excellent one.

THE PEACOCK INN, ROWSLEY.

"The roof timbers, when examined from within, show a decided tendency to thrust outwards, and it would, in our opinion, be well to put at least two tie-rods across at the wall plates, and going right through the framing, and spiked to the sides of the two principals.

"The lead on this roof is in want of repair, and we are glad to learn that it will be re-cast on the premises and put on again with an inscription recording the facts. Also that inscriptions in excellent character with borders recording three other re-castings of the lead in the seventeenth and eighteenth centuries will be carefully replaced. The substitution of modern rolled lead for cast is most mischievous.

"The woodwork of the present roof being weak with age, it is proposed to place over it a pine one, following its shape, on which to replace the lead—a very good plan, if carefully carried out.

"A certain amount of work has already been done to the lobby on the east side of the quadrangle, and its character seems to have been that of repair. Externally it does not show. The old beams of which the wall is composed have been supported by slender iron columns in the internal angles on each side of the doorway where they are hardly noticeable, and can, if desired, be readily hidden, which is not, however, necessary. The lead roof of this portion also is being repaired by re-casting the lead with new supports on the outside of the present rafters.

"The parapets to the part of the building which contains the kitchen were originally built of thin stone set on edge, and by reason of the very perishable nature of the local sandstone employed they are very weak and decayed on both sides, though the coping stones are in fair condition. There seems to be no alternative to rebuilding these parapets, which are of small extent and only visible from one point at the back. They are simply plain walls rising a few feet from the roof gutters, and should be rebuilt with stone of more durable nature, and the coping stones replaced. Some of the chimney tops require rebuilding; the old bricks should be re-used.

"Altogether the work is, it seems to us, being pursued on very wise lines, with a view simply to the reparation and upholding of the ancient work, and not to setting up copies or restorations of it. The only exception is the single new corbel in the kitchen. This, Alderman Tomson admitted, was unnecessarily large, and it could be reduced and thereby simplified and made plain and unobtrusive; the work done and contemplated would have our cordial approval.

"We are glad to see that electric light has been substituted for gas in the great hall, as the fumes of gas must be exceedingly bad for the priceless tapestry, especially the one made about 1500, to fit the wall at the back of the dais, but it is to be regretted that the simplest possible form of electrolier was not used. The present enormous mass of lacquered brass in the chief room almost prevents one seeing anything else."

ST. PAUL'S.

WHAT MR. SOMERS CLARKE SAYS.

MR. SOMERS CLARKE, the architect to the Dean and Chapter of St. Paul's Cathedral, writes to the "Times" as follows:—

Many reports have been circulated about the security of St. Paul's Cathedral which are not more remarkable for their conflicting nature than for their lack of authority. The public have been alarmed by statements about serious cracks in the fabric. These there are. They, expecting to see daylight shining through the walls, go away disappointed. Then we see comforting reports that there is really no cause for anxiety. The expectations of the one set of people are as unreasonable as the other reports are untrue. Never having seen any representative of the Press, information that has been attributed to me is wholly imaginary. It has been thought well that I should ask permission in your columns to make a statement as to what is the real condition of things, and this I will try to do as briefly as possible.

The Settlement of the Dome Piers and the Western Towers.

Within the first hundred years after the structure of the cathedral was finished the immense weight resting on the foundations of the eight piers which carry the dome and on the foundations of its abutments caused those parts of the structure to sink a little. Most ingeniously spread out as are these foundations so as to cover the largest possible area, the earth beneath them has consolidated rather more than under those parts of the fabric less heavily loaded. The settlement thus caused has broken the eight arches and the windows of the clearstory over them in the nave, the choir, and the north and south transepts, where they abut on the dome piers. In the same way the very great weight of the western towers has caused them to sink. In sinking they have cracked the west front in a vertical direction through the great door, the window above, and the vaulted ceiling of the portico. They have also cracked through the wall of the chapel to the east.

On Settlements in General.

It is very rarely that one finds one of our cathedrals with towers or other heavy features wherein such parts have not been a cause of settlement. Such settlements are not necessarily a cause of serious insecurity, but it is obvious that by them the integrity of the edifice is more or less destroyed. Where the structure was intended to be tied together by continuous masonry the continuity is broken. Arches which should exercise their pressure in a definite direction begin to act in directions unforeseen.

In buildings of pointed architecture such deformations are less serious in result than in those where round arches only are made use of. Pointed arches will undergo the most extraordinary distortions before they finally yield. The moment a round arch is broken or begins to spread the top flattens and its strength is jeopardized.

Iron Ties.

Above a 100 years since the development of the before-mentioned settlements gave cause for anxiety a system of great iron ties was introduced into St. Paul's Cathedral. These are placed so as to tie back to the dome piers the fronts of the north and south transepts; to counteract, in fact, the want of continuity caused by the breaking through of the arches and window already referred to. But another movement was also observed, and ties were introduced to counteract it. The transept fronts were found to be settling away from the main fabric and also themselves to be settling towards the east and west, this being demonstrated by a crack extending vertically through the windows. The damage in the south transept was greater than in the north, and has since developed. This we can tell by observing the size of the joints between the stones, many of which, after the fashion of the time, were run in with lead, now quite loose and not filling the joints.

What Wren Did.

Wren was well aware that the substratum on which the cathedral was to rest left much to be desired. The mediæval builders as a rule troubled themselves very little about foundations. Wren took all precautions that were known or practicable in his time. Examining the site of his new cathedral he found that, passing through the débris of Old London, he came, at a depth of some 15ft. or 16ft. from the surface, to a layer of clay, or "pot earth" as he terms it. This varied from 6ft. to 4ft. in thickness. The pot earth rests on a stratum of sand (not at all solid) mixed with gravel stones, the lower part wet. Below this, and some 35ft. to 40ft. from the surface, lies the London clay. Wren thought it out of the question to carry all his foundations down to the London clay. He rejected piles, foreseeing that wells or other things might more or less drain off the water from over the clay, and knowing that unless piles remain always under the same conditions they must certainly rot. He thought best, by spreading the foundations, to float the cathedral on the bed of "pot earth," and thus he built, never dreaming of the desperate attacks the sandy substratum under the pot earth would have to sustain. Had this substratum been left undisturbed, although there would no doubt have been some movement on the structure on the lines of the chief settlement we now see, there is no reason to apprehend that the movement would have continued.

Of the Trouble caused by Sewers

The very necessary increase of sanitation and of road improvement was probably the first serious attack on the substratum. The ground on which the cathedral stands slopes rapidly towards the south and the west. It is fairly level to the east and north. In all directions sewers were made and at various depths. It was proposed in 1832 to bring a sewer at some 30ft. below the surface through the churchyard on the south and east sides of the cathedral. Immediately the danger to the fabric that this would cause was pointed out, the Corporation of London, which has ever shown the greatest consideration for the cathedral, ordered the works to be stopped. The deep drain in these places has never been made. Unfortunately it was carried up Godliman Street almost into the churchyard, and must have done not a little to drain the substratum, especially near the south-west tower. The level of this sewer is considerably below the bottom of the foundation of the cathedral walls.

And the District Railway.

Some thirty years ago the Metropolitan District Railway was made under Queen Victoria Street, cutting a large gash along the southern slope of the hill on which the cathedral stands. The railway at its nearest point is but 530ft. away—that is, just about the length of the cathedral. The railway is, in fact, a huge trench cutting into the sandy stratum. The disturbance caused by making such a trench was very great. There cannot fail to have been a considerable change in the water-bearing conditions just above the London clay. A cutting once made the water will always follow it. Below the underground railway there has since been pierced the tube for the Waterloo and City Railway. How far this is down in the London clay I do not know.

A Riddled Site.

We find then that the southern slope of the hill on which the cathedral stands is fairly riddled with excavations of one sort and another. There are sewers, the underground railway and a tube at a lower level. The most remote of the railways or tubes is but just 500ft. from the cathedral foundations. Those who have studied earth movements, the result of deep excavations, know that a great deal of dislocation takes place in a line diagonally right and left of the parts excavated. The fact that the underground railway is 500ft. off does not ensure that resultant earth movements do not come much nearer to the cathedral.

Fresh Indications of Settlement.

During the last twenty years fresh indications of settlements have been showing themselves in the walls of the church. The movements are still in progress. Those most to be observed are on the south side. The worst are in the south transept. The way in which these have moved since the ties of 100 years ago were inserted shows that the settlements are due not to the thrusting of arches in the fabric itself but to the subsidence of the mass which at this place consists of a wall from 8ft. to 10ft. thick, 130ft. long, 130ft. high, and weighs between 12,000 and 13,000 tons.

The arch of the window head is so broken that the great keystone carved with a cherub had dropped more than 2in. from its place. Before the repairs just completed it was quite loose, and was merely held by the pinch of some stones at the back and by the ironwork of the window. The wall has, in fact, split vertically through the doorway and window over it, sinking gently in two masses right and left. The coffered window head we see from inside the church is quite out of shape, and the same dislocation in a less degree may be observed over the windows of the clearstory adjoining. The massive iron stanchions intended merely to resist the wind and to give rigidity to the lead glazing are now bent by the weight of the window arches pressing upon them. It would be going into too much technical detail to state in your columns where there are other indications of movement. It is enough to say that they exist on the south side of the church, and we know that some of them have continued to develop during the last three years. They are still developing.

The Future.

If we suppose it possible that the subsoil be left from thenceforward untouched, the settlements are of sufficient importance to make it necessary not only to watch them carefully but to expend considerable sums (out of a very limited income) on their repair. During the last four years the chapter has had to find the money for such works. But now comes the attack by the electric railways. One of these—the Victoria, City and Southern Electric Railway—proposes to come under the churchyard, taking a line between the cathedral and the great warehouses on the south. The centre line of the tube or tunnel would be about 40ft. from the south-west tower and 50ft. to 60ft. from the south transept. Another—the Piccadilly and City Railway—proposes to pass under Carter Lane—that is to say, under the first street immediately south of St. Paul's Churchyard. The centre line of this tunnel is at a distance of 170ft. both from the south-west tower and the south transept. It would be a little nearer to the cathedral than the width of the west front. It would be but 300ft. from the centre of the dome.

The "Tube" and the Cathedral.

We must not forget that the cathedral is already attacked on the north. Here is the tube of the Central London Railway, and this is but 460ft. from the centre of the dome. We know that this tunnel, passing as it does close to Bow Church, has already in the few short years since it was pierced caused the steeple to overhang 1ft. 9in. towards itself. Bow Church tower is a mere toy compared with the enormous weight of St. Paul's. The area of one of the western towers of St. Paul's is just double the area of Bow Church tower.

The Chief Danger to St. Paul's.

But the chief danger to the cathedral lies by no means only in piercing the tubes or in the vibration from passing trains. The tubes may be sunk ever so far down, the vibration may, and no doubt will, be very much reduced, but wherever the tube may be a tremendous hole must be made for the public to get at it. Then, when the bottom is reached there are footways, cross passages and all manner of subsidiary excavations. Who knows what underground streams may not be tapped in making these big shafts or how much superincumbent weight may affect excavations? The Piccadilly and City Railway proposes to place its terminus under the space where Cannon Street is crossed by Queen Victoria Street. The tunnels in which is the terminus must necessarily be of considerable length, and can hardly fail to come within 600ft. of the cathedral. The great hole and excavations to the east are, however, not more dangerous than would be those to the west on the slope of Ludgate Hill, where a station is projected. There is already, on the north, the Post Office station of the Central London Railway. The results of these big excavations and disturbances would very probably not show themselves seriously in the fabric of the cathedral for a good many years; but what is, let us say, fifty years in the life of a great national monument, one of the most magnificent buildings in the world, and which, taken due care of, may last for 1,000 years or more?

Mr. Charles Reilly proposes, as a means of rendering the cathedral secure against any dangers occasioned by underground railways or sewers, that the building should be supported on the bed of blue clay 35ft. below the surface. The cost of the underpinning necessary he estimates at £220,000. He has recently done the same thing to the hall of one of the City Companies, within 50ft. of the Stock Exchange itself, when isolated stone piers weighing 300 tons were safely underpinned to a depth of 50ft. without cracking the plastering in the rooms above.

ASYLUM BUILDING.

THE LUNACY COMMISSIONERS' REPORT.

IN their fifty-fifth report, dealing with the question of the provision of cheaper asylum accommodation, the Commissioners in Lunacy observe that the rapid rise in the cost of asylum construction due to the advance in the price of materials and labour has accentuated the importance of a careful consideration of present methods and future possibilities of asylum provision. What seems to be desirable is the greater differentiation of asylum buildings, in the provision of everything that the hospital system can secure for the recoverable and acutely sick, and of simple inexpensive buildings, either in the form of cottage or otherwise, for those who need a home under supervision and nursing should they be or become sick. In this way it would be possible to limit the waste of expensive machinery, and enable due provision to be made without imposing an intolerable burden upon the public. "It may be that the provision of less expensive buildings for certain classes of patients may assume new forms and developments by virtue of modern methods of manufacture, which have succeeded in producing, bulk for bulk, greatly increased strength of material. By the use of these, perhaps in one-storey buildings, there might possibly be introduced into asylum construction a new element of cheapness without any sacrifice of comfort, safety or convenience. In each of these and in other similar ways it may become possible to diminish the cost of asylums, while leaving them suitable for all their purposes, and by so much to lessen the public burden, which is growing so rapidly and becoming so onerous. But in addition to these we have no doubt that those who represent the local authorities in asylum matters should exercise more careful scrutiny and control over the decorative fittings and finishings of new asylums and of additions to old ones, and, while securing adequate comfort and brightness and cheerfulness of aspect, excise that which is unnecessary, unsuitable or redundant, a process in which they will have our hearty support. While bearing in mind the primary and fundamental objects of asylums, and desiring in no way to suggest any limitation of their proper equipment for the discharge of their legitimate functions, we view with some concern a growing tendency to extravagance in some of the details to which we have referred, and especially in those parts of the buildings which are devoted to official and administrative purposes, and we have thought it desirable to prepare and issue the following circular: 'In view of the rapid increase in the price of labour and materials, and the corresponding cost of asylum construction, we think it necessary to urge the need of such strict economy in the building, finishing, fitting and furnishing of asylums as is compatible with the adequate discharge of the objects which are contemplated in their provision—namely, the cure of those who may recover, and the safety and comfort of those whose prospects may be less hopeful. While it is necessary to provide solid and substantial structures of adequate but not superfluous strength, and cheerful and comfortable accommodation suitable for the classes of persons who are to be housed and treated within them, all extravagant and, therefore, unsuitable decoration both inside and out should be carefully avoided; and we shall regard it as our duty to advise the Secretary of State to refuse his approval of all plans in which there is an obvious departure from this principle.'"

YOULGREAVE CHURCH, DERBYSHIRE, FROM THE SOUTH-EAST.

IMPROVEMENTS AT NORTHAMPTON OPERA HOUSE.

DURING the past few weeks extensive improvements have been effected in the Northampton Opera House. The theatre has been thoroughly cleaned and re-decorated, additional pit exits have been provided, and orchestra stalls have been erected. The chief alteration concerns the stalls. Several of the front rows of seats in the pit were removed, and in their place three rows of orchestra stalls, accommodating sixty-two persons, have been erected. The orchestra accommodation has also been increased and improved. At the rear of the pit two additional exits leading into Swan Street have been made, and an extension of the pit accommodation has been decided upon and will shortly be commenced. The pit seats are now placed in straight rows instead of being curved. The electric lighting has been installed in the pit and in various other parts of the theatre, and the pit has been re-papered in a rich red shade. The fronts of the gallery, dress circle and boxes have been thoroughly cleaned and renovated. The "crush room" has been re-papered, re-carpeted and re-decorated, and various other minor improvements and renovations have been made in other directions. These changes, however, are but an instalment, for Mr. Lockwood is looking forward to being able to still further improve the theatre at an early date. The work has been done by Messrs. A. R. Dean, Ltd., of Birmingham.

THE PRACTICE OF STACK BUILDING AND BOILER SETTING.—II.

BY JOHN G. DUNN (INSTRUCTOR IN BUILDING CONSTRUCTION).

(Concluded from p. 526, No. CCCXXXIX.)

A BINDING of some sort is essential for a stack. Concrete, terra-cotta blocks bound or tied in with hoop-iron, or cast-iron heads may be used.

During a recent storm the wind was blowing at the rate of 64 miles an hour and showing a pressure of 22lb. per sq. ft. at 9.45 p.m. and 29lb. at 12.30 a.m. Suppose the wind to be blowing not steadily but in concentrated gusts upon the surface opposed to it. If one gust causes the structure to oscillate, and just as it has passed through this oscillation and is about to commence another and smaller one, a second gust strikes it, the energy of this will be added to what remains of the energy of the first, and by the continuation of such action the force of the oscillations may be so increased as to cause the structure to overturn, although quite stable enough to resist the steady continuous pressure of the wind. Increasing oscillation is then a more distinct warning than amplitude of oscillation, for as long as the amplitude does not increase we may consider the work safe; when it does increase, however, the fate of the work will depend upon the duration of the storm. If the wind blows against a flat surface at right angles to its course, the whole effective pressure will be the pressure of the wind per sq. ft. multiplied by the area acted upon. This will not, however, be the case with a round surface such as one side of a cylindrical column. Let the wind be assumed to be blowing in the direction of the arrow on the accompanying diagram (Fig. 1) with a force of P pounds per super. ft. At the point R the wind will exert its full force on the surface. But take two parts of the surface having their centres A and B at 45 degs. from R, and examine the effects of the wind blowing on these parts. Its force will be expended partly in normal pressure at right angles to the surface, partly in continuing the motion of its particles, but in a direction at right angles to that pressure. Draw the radii A C and B C at right angles to tangents A D and B E. An equal surface being taken, the wind forces will be equal. Let A F and B G represent these forces. Complete the parallelograms. Those forces pressing towards the centre of the column will be represented by A L and B H. Produce these and make C N and C M respectively equal to A L and B H. Complete parallelogram C M O N. The resultant, C O, which is the resultant pressure of the two forces at A B, is equal to one of them, A F or B G. The force then in the direction of the wind varies from the maximum at R to O at S′ S′, and it may be shown that that total pressure on the column will be the wind-pressure multiplied by the height of the column and by its radius.

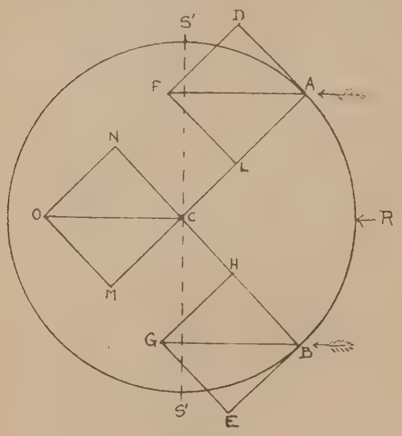


FIG. 1.

In the same manner it may be shown that if the wind blows in the direction of one of the diagonals of a square chimney, the whole pressure upon it will be that due to the wind blowing at right angles to one of its sides multiplied by ·707. For hollow square (see Fig. 2): $\frac{T}{6}$ from F, $\frac{T}{3}$ from middle of joint. For hollow circle (see Fig. 3): $\frac{T}{4}$ from f, $\frac{T}{4}$ from middle of joint.

Formula: $W \times \frac{T}{6} = P \times \frac{H}{2}$ for square, and $W \times \frac{T}{4} = P \times \frac{H}{2}$ for circle.

Other formulæ—
Prof. Hawksley:

$$P = \frac{V^2}{200}$$

V=Velocity in miles per hour.
P=Pressure in lbs. per sq. ft.

Rouse:

$$P = \frac{V^2}{20}$$

V=Speed of wind in ft. per second.
P=Pressure in lbs. per sq. ft.

The pressure in both cases is at right angles to the direction of the wind on every sq. ft.

Lightning conductors are very essential for the protection of stacks. Engineers differ about the best metal for a lightning conductor (that is, taking cost into consideration), but all are agreed that copper has the best conductivity for any given sectional area. The scale runs thus:

	Conductivity.
Copper	100 per cent.
Silver	99 ,,
Gold	80 ,,
Zinc	29 ,,
Platinum	18 ,,
Iron	17 ,,
Lead	8 ,,

This shows that you can use a much lighter section of copper than iron, and as it will be much easier to fix the difference in the cost of the two is not very great. Some persons contend that there should be as many fine points (say of copper, and plated with gold or nickel) as possible at the top, while others prefer a bow or double-bow of, say, galvanised iron across the top of the chimney. A conductor should be flat, not circular, in section, and perfectly stranded (especially if of copper). It should be attached to, but not insulated from, the building which it is intended to protect. There should be as few joints as possible, and where these occur they should be soldered. The conductor should terminate 10ft. or 20ft. from the foundation, and should slope downwards in the ground to a depth of at least 6ft. The end of the rod is soldered on to a 2ft. or 2ft. 6in. sq. copper plate. This is embedded in the earth and covered with 2ft. or 3ft. of coke, so as to form a drain and keep the whole moist. The holdfasts should be of the same material as the conductor. They vary in form.

A good form consists of two holdfasts batted in with lead, with a cover-plate recessed to fit the conductor bolted on the face.

The following are some particulars of the chimney at St. Andrew's Cross Electricity Works: Height, 200ft.; extreme width, 20ft. 4in. at bottom and 11ft. 9in. at top; brickwork, 14in. thick at top, with an additional 4½in. every 30ft. down = 1½—2—2½—3—3½—4—4½. Brick lining of firebrick additional 9in. thick, 50ft. high, with an air-space of 9in. This is built with a batter of ⅛in. per ft. External batter ¼in. = 1ft. or 1 in 48. Octagonal on plan at bottom, with two air conduits on each side, to keep the interior of the brickwork cool. The top of the lining has a few chequered courses into the main wall, this being topped by a double course of fire-tiles. At the bottom the work was built plumb inside for 15ft. high. Finished with a coping of terra-cotta blocks cramped together. The lightning conductor consists of a flat copper band 1¾in. × ¼in., one being run up on each of two sides. These again are each split into two about 20ft. from the top, and have forked terminals.

Another stack 125ft. high has 25ft. of 9in. work, with an additional 4½in. in every 25ft. down: 20ft. of 4½in. firebrick lining and a 4in. cavity (ventilated).

Referring to Tennant's stack, the formula, considering weight of stack to resist storms, is: $W = C\frac{a\,h^2}{b}$, where w = weight; a = average width of shaft; h = height; b = breadth of base; C = constant 56 for a square chimney, 35 for octagon and 28 for round.

London Building Act regarding chimney shafts:—

Unless the Council otherwise permit, every chimney shaft for the furnace of a steam engine, brewery, distillery or manufactory shall be constructed in conformity with the following rules:

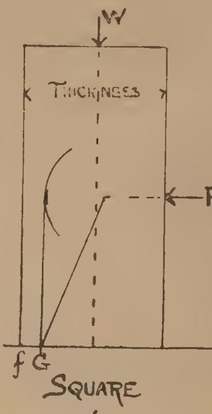


FIG. 2.

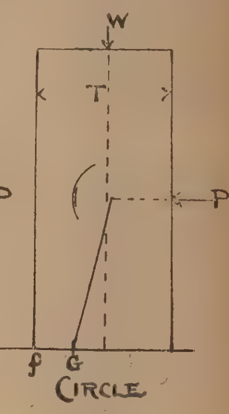


FIG. 3.

(1) Every shaft shall be carried up throughout in brickwork and mortar of the best quality, and if detached shall taper gradually from the base to the top of the shaft at the rate of at least 2½in. in 10ft. of height.

(2) The thickness of brickwork at top of shaft and for 20ft. below the top shall be at least 9in., and shall be increased at least one half-brick for every additional 20ft. measured downwards.

(3) Every cap, cornice, pedestal, plinth, string-course or other variation from plain brickwork shall be provided as additional to the thickness of brickwork required under this Act. And every cap shall be constructed and secured to the satisfaction of the district surveyor.

(4) The foundations of the shaft shall always be made to the satisfaction of the district surveyor on concrete or other sufficient foundation.

(5) The footings shall spread all round the base by regular offsets to a projection equal to the thickness of the enclosing brickwork at the base of the shaft, and the space enclosed by the footings shall be filled in solid as the work progresses.

(6) The width of the base of the shaft if square shall be at least one-tenth of the proposed height of the shaft, or if the same be round or of any other shape then one-twelfth of height.

(7) Any firebricks built inside the lower portion of the shaft shall be provided as additional to and independent of the thickness of brickwork prescribed by these rules, and shall not be bonded therewith.

Boiler Setting.

As a rule, engineers supply working drawings with their boiler, but a few hints regarding the different methods of setting may be helpful to us as architectural craftsmen.

Draught is caused by the difference in weight between one body of air and another, and the intensity depends on the amount of that difference. With steam boilers the chimney is the chamber with the hot gases, and the space outside the furnace is the chamber with the cold gases. Two columns of air of equal height and area and temperature would remain at equilibrium. When, however, the furnace gets heated and the hot gases are driven up the chimney, the gases in it are at a higher temperature than the air in front of the furnace. The rapidity with which they ascend will depend on their difference of temperature. With the same temperature inside the chimney, one twice the height of the other will have twice the difference between the pressures at the foot.

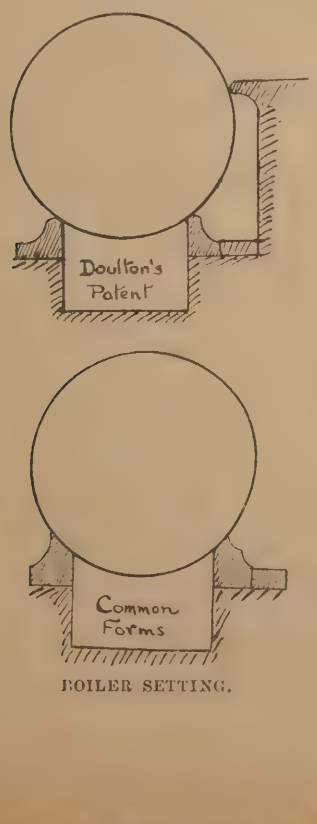
It thus follows that the difference of pressure, and thus the draught of the furnace, is directly proportional to the height of the chimney.

In many cases the waste gases coming along two different passages about the boiler meet together and reach the outside air by a common chimney. If two flues enter the common flue by orifices opposite each other, the influence of their currents on one another will be nil (if they have equal rapidity), because the whole will pass as if they had struck against a plane fixed between them. If, however, the currents be unequal, that which has the greatest rapidity will reduce the speed of the other, and will have the effect of closing the orifice through which both should flow. These streams of air in this respect act on each other like streams of water; under such conditions a diaphragm will have the effect of making the stronger current assist the weaker and cause it to have more draught, thus producing an equalising effect.

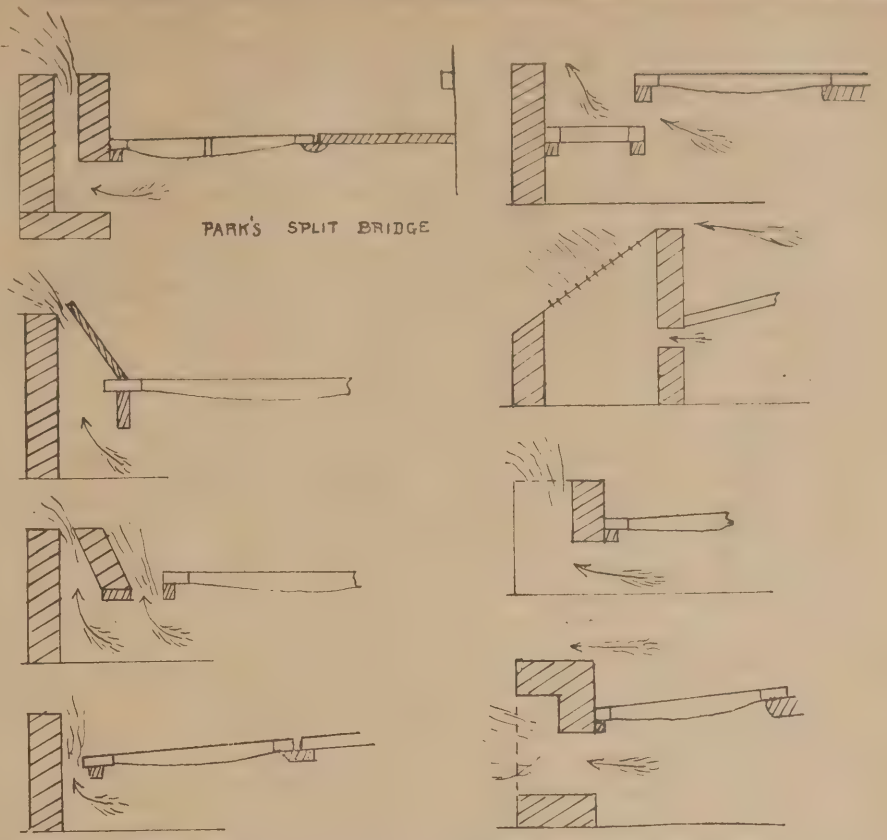
Right angles should be avoided as much as possible, and all necessary angles rounded.

The finer the class of work in boilers and chimneys the less will be the friction.

Examples of Boilers.—Boilers are of very different forms. For land stationary purposes, by far the most largely used in this country are those of the Lancashire (double flue), Cornish (single flue) and Galloway types. Water-tube boilers of the Babcock and Wilcox type (Stirlings, &c.) are, however, being adopted to some extent, especially in connection with electric lighting and other work where the demand for steam is intermittent; and with the existing tendency towards the use of higher steam pressures this form of generator is likely to be much more extensively employed. Cornish boilers are made of 4ft. to 6ft. diameter, and Lancashire from 6ft. to 8ft. 6in The chief objects to be aimed at are: Accessibility of the flues for examination and cleaning; minimum of brickwork in contact with the plates so as to avoid as far as possible concealment of the plates and the harbouring of moisture; deflecting and distributing the gases in such a manner as to obtain the greatest efficiency from them, and at the same time obviating as far as practicable unequal expansion and contraction of the shell without checking the draught. In good practice it is usual to seat the boiler on special fireclay blocks, so that it is supported on a narrow surface on each side, the surface in contact with the plates being from a mere circular ridge up to 3½in. or 4in. wide in the ordinary blocks. The blocks are shaped so as to support the weight without crushing, and to give the greatest amount of room in the side flues and conduct away from the plates any moisture which may run down the sides of the boiler. Special arched fire-tiles are used for the flue covers. The products of combustion on leaving the flues should pass, first under the bottom of the boiler, splitting at the front end and flowing along the side flues to the back and thence to the chimney. By this means the bottom and sides of the boiler are maintained at a more equable temperature than would be the case if the gases passed through the side flues first. If they pass through the side flues first the draught will be downward, thus reducing the heating area; the high side flue is thus causing more harm than good because of its low temperature.



BOILER SETTING.



DIFFERENT FORMS OF BRIDGES FOR THE PREVENTION OF SMOKE. MECHANICAL MIXTURE OF AIR AND GAS CONTINUOUSLY AFFECTED.

The damper if in a flue with too much draught should not be allowed to stand, or rather hang, nearly its depth in the flue, as the gases will not heat more than the depth of the open space along the side flue. The best dampers rotate on a central axis, and thus do not affect the height of the draught. The top of the side flues should not be above the level of the furnace crowns, and the seating blocks and saddle covers should not come in contact with the lines of rivets of longitudinal seams of the shell. The front cross-wall should be clear of the shell angle-iron and recessed (if need be) for an elbow-pipe to the blow-off. All external walls should be built with a batter (rather more than that for the stack) to allow expansion and not show hanging. All parts exposed to heat should be built with firebricks set in fireclay (no sand being used). The other parts may be built with good shell mortar (3 to 1). Great care should be taken to have the bricks alike in thickness, so as to secure good transverse bond; and as the fireclay work does not stand compression well it should be built tight. It is preferable to have the common bricks a little thinner than the firebricks.

No lime should be allowed to touch the plates of the boiler, as it eats away the shell. At the front, where the fireclay would get washed out, I have often used Portland cement (Roman cement is an excellent covering to iron and steel, and so is best for this part to withstand the weather and protect the joint).

Boilers should have a bed of concrete over the area beneath them. This should be protected in the flues by a firebrick paving. The front, to which the boiler should have a slight dip, should be drained not only for blow-off water and boiler-cleaning, but also for surface water.

Different arrangements have been used to prevent the ashes falling in the pit in front of the boilers. The best I know of is a cast-iron cradling piece, which fits the underside of the boiler and has an angle ledge on which to rest the front footing plates.

I could not close this paper without alluding to the economiser and smoke-preventer. An economiser consists of a collection of cast-iron tubes placed directly in the flues, so that the hot gases may play round and give up some of their heat to the feed water which is pumped through these tubes. An arrangement for cleaning the tubes is now fitted up with Green's Economiser (the most popular one), and a saving of from 20 to 30 per cent. of coal is secured by its use.

Various inventions have been tried to prevent smoke; and while I believe the smoke can be lessened, or rather the coal can be burned without smoke, still we must remember what was pointed out in an earlier part of the lecture, that complete combustion can only take place where you have practically perfect fuel, and not with the common forms of coal used for steam raising.

In the apparatus employed at the Blind Asylum there is a spray of water falling on the particles of soot, flue dust, &c., in the flue. A fan is fixed above the flue giving mechanical draught with a small stack.

HOUSING AT MANCHESTER.

THE SUTTON BEQUEST.

A WRITER in the "Manchester Evening Chronicle" suggests that the solution of the housing problem in that city might be greatly assisted by the magnificent bequest of Mr. Sutton, who has left nearly two millions to be devoted to the better housing of the working classes in London and some of the largest provincial towns. This writer says: "That there is a housing problem in the city has been recognised for very many years, although it was not until about 1885 that any serious work was done to cope with the question. Under the Labourers' Dwellings Improvement Act, 1875, and other special Acts since passed to facilitate the improvement of insanitary areas, a number of improvement schemes have been carried out. Action under these Acts was commenced in 1889, when the area bounded by Cornwall Street, George Leigh Street, Bengal Street and Oldham Road was declared an unhealthy area, and was compulsorily purchased by the Corporation at a cost of £97,481. At the same time an area in Pollard Street was bought for £9,546. The Oldham Road scheme is the most important that has been undertaken by the Corporation. The contract price for the whole of the buildings now in existence was about £70,000, but this was greatly exceeded in the actual cost. The plan adopted was to divide the work into two. There is Oldham Road Block No. 1, which is a building of five storeys round a quadrangle, with 285 tenements and accommodation for 848 persons, and Oldham Road Block No. 2, which has accommodation for 425 persons. At Pollard

Street the arrangement is very similar to that in Oldham Road, and the accommodation is for 448 persons. Other schemes which have been taken in hand by the Corporation include those dealing with the Harrison Street area (lodging-house for men, with accommodation for 363 persons); Chester Street area (tenement buildings, two storeys high, with accommodation for 324 persons); and Pott Street area (tenement dwellings, with accommodation for 321 persons). Thus the Corporation since 1891 has wiped out some hundreds of unhealthy dwellings under the special Acts, and has built new houses and tenements for no fewer than 2,729 persons.

"Of course it cannot be pretended that this work, great as it is, really touches more than the fringe of the housing problem. But it has been honest work, whether under the local or the general law, and has evidenced a desire to do something to alleviate the miserable conditions under which many of the poor have to live. Comparatively little has been done in the past few months, but the hope of receiving assistance from the Sutton Trust should serve as a stimulus. If any money is received it will be the first halfpenny which has been used in Manchester for the better housing of the poor other than that provided by the rates. It is badly wanted. With a considerable grant, say, of £100,000, such work might be done in the provision of new dwellings built on now sparsely-occupied land that the Sanitary Committee could continue its crusade under the local Act without further interruption, and thus add considerably to its already good work at a trifling cost. It is too early to speculate as to what policy will actually be pursued by the Sutton trustees. For the moment it is sufficient to show (as I have endeavoured to do) that Manchester has tried to improve the housing of the people, under the peculiarly awkward legal difficulties which exist, and has so far succeeded that any encouragement by way of a grant from the great bequest would be well deserved."

Restoration of Halesowen Church.—As much of the stonework of Halesowen Parish Church has recently decayed very badly, the Church Council have found it necessary to restore the external walls, some of which have been pronounced dangerous. The tender of Messrs. Collins & Godfrey, of Tewkesbury, for £1,025, has been accepted. The whole of the work it is deemed necessary to execute will cost £1,200.

FRIEDRICHSHOF.

OVER the main entrance to the Palace of Friedrichshof, near Cronberg, where the Empress Frederick died, there is written "Friederici Memoriæ," a simple dedication suggested by the architect, Herr Ihne. The building stands free and open to the gaze of all who dwell over the wide Frankfort plain, only sheltered on the north by the pine-clad Taunus range of mountains. Geheimer Hof-Baurath Ihne carefully studied the architecture of the mediæval castles of that part of Germany, and designed a mansion that combined all the typical features of the princely and noble residences of the locality with the improvements introduced by modern science and civilisation. Amongst the many details of interest in the construction may be mentioned the copper rain-boxes that form the headings of the pillars, most of them constructed after a pattern discovered by chance at Windsor by the deceased Empress when on a visit to the late Queen. The bronze knockers on the doors are also a feature of the ornamental decoration outside the edifice, which were collected from all parts of the Continent during a long period of years—most of them from Italy.

Entering the mansion by the main entrance one finds oneself in a spacious and imposing hall, which used to be a favourite gathering-place for the late Empress and her family and guests. She had here her own favourite chair at a table which is situated in front of a fireplace from Brescia, over which, carved in stone, are some appropriate lines from Dante. In the corridor flanking the hall is a music-gallery, and the walls downstairs, on the first storey and on the staircase are hung with valuable French, Italian and Spanish tapestries and interesting portraits and other pictures. The grand staircase leads to the late Empress's private apartments and to the adjoining State rooms. There is also a good deal of interesting wood-carving reflecting old associations with her native land of England, and of old armour on the staircase, and the long corridor above-mentioned is full of cabinets of great value. The suite of reception-rooms, which are entered from the corridor, face the south and form the front of the *schloss.* They consist of the library at the west end, the late Empress's private drawing-room, the large drawing-room, which opens on to a magnificent and spacious terrace commanding an extensive view over the Frankfort plain, from which at night can be seen the lights of the city; the assembly-room, and the large dining-room. The hooded fireplace in the library is interesting, and over the door leading into the late Empress's private drawing-room is a fresco copy of the well known picture shown in Cologne Cathedral. The dining-room has a large fireplace, with a marble bust of the Emperor Frederick standing in the centre of the mantelpiece, and forms the east end of the front suite of rooms. On this floor also are a small billiard-room and a small dining- or breakfast-room in which the royal family take their breakfast and afternoon tea. In the basement are two excellent kitchens—a large one for the family, and a smaller one for the servants. The smoking-room is at the top of the house.

Of the gardens it may be said that everything grows luxuriously at Friedrichshof, the rose-garden being a glorious sight in summer.

GENERAL VIEW OF CHARTRES CATHEDRAL.

CHARTRES CATHEDRAL.

CHARTRES CATHEDRAL, of which we give an illustration on this page, is one of the six "grandes cathedrales" of France (they are, Paris, Amiens, Bourges, Chartres, Laon and Rheims) and still retains intact thirteenth-century stained-glass lights large and small to a number exceeding 170; the harmonious glass of Gothic art at its best before the glass-pictures of the sixteenth century, beautiful in their own way, supplanted it even to its actual destruction. Chartres, of stone figures beyond 4,000, pronounced by the Abbé Bulteau to be "l'expression la plus complète de la pensée chrétienne et artistique du moyen âge." Chartres, of origin so remote that according to tradition so far ago as a century before the Christian era the Druids venerated on its site a wooden effigy with the dedication "Virgini parituræ." Of Chartres indeed all has been said, and it remains now to contemplate it with delight.

Berks Archæological Society.—A number of members of the Berks Archæological Society visited Wantage, Charney, Denchworth, Faringdon, and other places in the district recently. They inspected the old parish church at Faringdon. The president of the society, Mr. C. E. Keyser, pointed out where one style of building ended and another began, giving the approximate dates of each from about 1170. The church was one of the finest specimens of architecture in Berkshire, and the ironwork on one of the doors was not excelled by any in England.

THE RUINS OF BASINGWERK ABBEY.

By HENRY TAYLOR, F.S.A.

ON the occasion of the Chester and North Wales Archæological Society's recent visit to Basingwerk Abbey, Mr. Henry Taylor, F.S.A., read an interesting paper on the historic ruins. The following are extracts :—

During the Middle Ages devotees from all parts of Christendom were in the habit of visiting St. Winefred's Well. That a place of this religious celebrity should be long without its monastic establishment is hardly to be expected. . . . Accordingly we find that a society of monks did exist here previous to the year 1119, for it is said that Richard, the son of Hugh Lupus, Earl of Chester, was attacked by the Welsh on his pilgrimage to the Virgin's Well, and was obliged to take refuge in an abbey in the neighbourhood, but how long it had existed prior to that date we have no means of ascertaining. Nor is it known who the original founder was. It is probable the Cistercian Order was introduced into Basingwerk by Randle, the second Earl of Chester, A.D. 1131. He was one of the greatest benefactors to the abbey.

The following description of the remains as they were in 1846 is given in the first volume of the "Archæologia Cambrensis": "The general style of the remains of this religious house is the Early Pointed, corresponding closely in character to the time of Henry II. or the latter half of the twelfth century ; the masonry work is good and carefully finished, but there are very few traces of ornament remaining, not even any foliations being observable in the windows. The ruins consist of the abbey church, running from west to east, with a little deviation to the south, the refectory, abbot's buildings, barns and grange, and probably a portion of the porter's lodge. The church was cruciform, consisting of a nave, with a single aisle at each side, transepts without aisles, and a chancel, probably also without aisles. Of the edifice nothing is left standing except the southern transept and a few courses of the outer wall of the southern aisle ; nevertheless, from the traces of rubbish, &c., the plan of the church may be made out satisfactorily except for the chancel. . . . As far as can be guessed from the present condition of the church the nave was about 80ft. long by 25ft. wide, the aisles were 10ft. wide, the piers of the nave arches were circular or octagonal, massive, and supporting bold arches very slightly pointed, like those of Buildwas Abbey ; one pier and half an arch are still remaining. The transepts were 20ft. long by 17ft. wide. . . . The chancel could not have been more than 25ft. or 30ft. long, and was probably as wide as the nave. . . . The refectory, entered by a circular-headed door from the cloister, extended southwards from the wall of the southern transept, about 75ft. and 17ft. wide ; it had the dormitory above, and both apartments were lighted by small lancet windows with very wide and bold internal splays. . . ."

There is a legend that part of the roof of Cilcain Church came from Basingwerk and another that the roof of the ancient church of St. Mary-on-the-Hill, at Chester, was brought from the abbey. By taking measurements it may perhaps be possible to ascertain how far both these legends are correct. No doubt the roof of St. Mary's at Chester is Perpendicular work, but then Basingwerk appears to have had alterations and additions made to it about the time of King Henry VII. The late Mr. Loftus Brock, F.S.A., the learned architect of the diocese of Canterbury, in a paper read before the British Archæological Association, said of Basingwerk : "The style of the church is Early English of a good type, and when perfect of an excellent effect. The base of the south wall of the south transept seems somewhat earlier, and may be a portion of the 'small cell' which existed in the time of the Giraldus Cambrensis. It has a small round-headed opening into the sacristy, a chamber, however now quite destroyed, but we trace a round-headed and chamfered doorway which afforded entrance to it from the cloisters, and also a portion of a Perpendicular window, eastward." This latter, like the roof, may have been made in the time of Henry VII.

CARDIFF'S NEW TOWN HALL.

PROGRESS OF THE WORK.

ROUGHLY speaking, the value of the work done on the new town-hall and law courts in Cathays Park, Cardiff, up to the present is £30,000, out of a contract price of something like a quarter of a million.

On the town hall there are employed one manager, five foremen, thirty excavators, twenty-nine bricklayers, fifty-three masons (including the eighteen dressing stone at the yard in Penarth Road), five carpenters, two smiths, two plumbers, two painters, twenty labourers, five scaffolders, fourteen machinists and engine drivers, ten stone labourers and fifteen crane fixers. On the law courts there are three foremen, twenty-six excavators and concrete layers, twenty-eight bricklayers, four masons, eighteen labourers, eight crane fixers and five scaffolders.

The whole of the heavy foundations of the town hall are completed, and the masonry rises to an average of 3ft. or 4ft. above the ground-floor level. In the exterior walls of both the town-hall and the law courts the level for the foundation-stone has been reached—about 6ft. or 8ft. above the road level. The date for the ceremony attending the laying of the stones has not yet been fixed, but preparations are already being made for it.

So far the principal work has been in laying the foundations, and on the general line of the building they are laid to a depth of 9ft. below the ground floor. The ground was everywhere found to be good, and it was only in one part that a difficulty was encountered. This was in the north-west corner, where deep excavations for the boilers took the operations below the level of the sewer. Water came in, and with asphalt and concrete the boiler-rooms had to be converted into something like a submerged tank, and the foundations carried to about 15ft. below the ground floor level. On the eastern side, looking in from the exterior through the fresh-air openings to be left in the Portland stone frontage, half below the ground level, can be seen the circular spaces in the brick walling for the huge fans which are to ventilate the building.

The law courts are not so forward as the town-hall, mainly because the foundation work has been heavier, the walls thicker—especially where the cells are—and inside the four-square of the exterior there is the complicated body of foundations on which the various courts and rooms have to be built, instead of the large light areas that form quadrangles in the town-hall.

The contractors (Messrs. Turner & Sons) have employed the most modern machinery, with the view of saving labour as much as possible and also carrying out the work expeditiously. There are now in use, or shortly will be, eight electric derrick cranes each capable of lifting 5 tons. They are elevated 40ft. above the ground, and although the jibs or arms are 80ft. in length they are so arranged that they can all be worked at the same time for conveying material to any part of the building where it is required. There are in addition two locomotive steam cranes capable of lifting 5 tons, and a number of hand cranes, both fixed and movable. A 10-ton steam gantry which is employed has been specially constructed for the work, and travels at the rate of 200ft. a minute. The bulk of the stone is sawn and dressed on the ground, the remainder being dealt with at Messrs. Turner & Sons' works in Eldon Road, where they have more plant than on the Cathays Park. The electric cranes are, so far as we can ascertain, the first of the kind introduced into building operations. They are driven from one central dynamo, the contractors providing their own power for generating the current. One of the most interesting machines used in preparing the stone is a circular diamond saw, which cost £150. There are also four stone modelling machines. These are only a few of the most important items in the immense plant employed on the ground, the total cost of which is about £12,000. The contractors are confident of completing the work within the period specified, which gives them nearly four years from the present time.

Extensive Building Operations near Heath, Chesterfield.—The Hardwick Colliery Co. intend to erect 400 houses for the employees of the Holmwood pit.

THE WIDENING OF PICCADILLY.

OPINIONS OF TWO PROMINENT MEN.

CONSIDERABLE discussion has been going on in the public press (chiefly in the "Times") with respect to the proposed widening of Piccadilly by taking a strip off the Green Park, a scheme which we protested against when it was first mooted.

Sir Edward Poynter's Objections.

Sir Edward Poynter in a letter to the "Times" makes the following remarks : "Other correspondents have clearly shown, as is indeed obvious, that no widening of the road between Berkeley Street and Hyde Park Corner will have any effect in relieving the obstruction to the traffic where it occurs at Hamilton Place or to the east beyond Berkeley Street as far as Piccadilly Circus, while on the other hand the part of Piccadilly which it is proposed to alter is precisely that part which is wide enough for the traffic to flow quite freely. The scheme is really unintelligible from any point of view, for it will certainly be no improvement to the appearance of Piccadilly to cut off a portion of the Green Park and destroy a number of the fine trees which constitute the beauty of the thoroughfare. . . . I have always considered that these trees give a peculiar charm to that part of Piccadilly ; they are a survival of a time when London was a less hideous Babel than circumstances have now made it, and linger there as a reminder of a past and more tranquil condition of life. . . . It may be objected that it is proposed to enlarge the space in front of Buckingham Palace ; but it has been settled almost unanimously by the public voice that that spot is the most appropriate place for the National Memorial to our late Queen, and if the monument, which must necessarily be of an imposing size, is to be properly seen it must have a certain space around it of a symmetrical character of which it must form the centre, and this, unfortunately, cannot be done without some encroachment on St. James's Park. It is to be regretted, but the omelette cannot be made without some breaking of eggs. The alteration of the Mall is another affair, and may well be postponed until the monument and the new piazza are complete, when it will be seen whether an alteration is a real necessity. The big boulevard mania has been the ruin of many a beautiful and characteristic quarter in fine old foreign towns. A street or a square are not necessarily, as many would appear to think, more beautiful for being of exaggerated size ; on the contrary, they are apt to make vast and tiresome blanks as inconvenient as they are monotonous. Any tendency to this form of megalomania is to be avoided, and, above all, our unique parks, with their truly sylvan scenery, are to be respected."

Sir John Wolfe Barry revives his Subway Scheme.

In connection with the proposed alteration to Piccadilly Sir John Wolfe Barry revives his scheme (suggested two years ago at a meeting of the Society of Arts) for constructing a subway at Hyde Park Corner so that the east and west traffic (vehicular and pedestrian) might pass clear of the north and south traffic.

Eastward of Down Street, Piccadilly rises to Hyde Park Corner to the extent of 12ft. by a gradient of about 1 in 50, and the Knightsbridge Road falls westward from Hyde Park Corner to the extent of 20ft. by a gradient of 1 in 40 towards Wilton Place. "It would thus be easy," says Sir Wolfe Barry, "by utilising for the purpose a narrow strip of the Green Park to construct a sunken road on the south side of Piccadilly descending gently towards the west by a gradient of 1 in 70 to join a covered way which would extend under the wide space opposite the gates of Hyde Park and under the junction of Grosvenor Place. The covered way would be about 340yds. in length, and would bend gently to the north in order to avoid St. George's Hospital and to emerge on the north side of the Knightsbridge Road at a spot slightly to the west of the hospital in the narrow strip of land of Hyde Park between the railings of the park and the road in the park leading to Knightsbridge Barracks. The sunken road would rise from the west end of the covered way by a gradient of 1 in 50 so as to join the

Knightsbridge Road opposite Wilton Place. . . . The sunken road and covered way which I propose would be 70ft. in width, which, seeing that no shops or houses would open on to it, would be ample for all purposes. I may mention as an example that the width of the Tower Bridge is 60ft. The side walls of the sunken road might be treated architecturally by panelling or otherwise, and be surmounted by ornamental stone balustrades, while both the walls and the covered way should be faced with glazed bricks. I am convinced that under proper architectural guidance the whole work might be made very handsome."

New Patents.

These patents are open to opposition until September 17th.

1900.—**T-squares.**—14,437. H. W. ROBERTS, Kingston House, Newmarket. A strip of wood, to act as a knob, is fixed on the blade at the centre of gravity: the object being to make it easier to move the T-square about. A further attachment enables the square to be raised or lowered conveniently.

Utilising Sewage Sludge.—16,104. C. J. WHITTAKER, West Bank, Lytham. The sludge or scum is mixed with coal dust and small coal in the proportion of 50 parts of the sludge to 50 parts of the coal. It is then made into briquettes.

Lever Cramp.—16,665. R. CHARLES, 113, Osborn Road, Sparkhill, Birmingham. This cramp is intended for holding pieces of wood against a bench stop. It consists of a base plate, having spikes on the underside, with a sliding fork actuated by a toothed sector lever. The cramp is hammered down on the bench and the lever moved sufficiently to press the fork tightly against the end of the wood, so securing it for working.

Drain Scrapers.—17,103. W. H. GIBBS, 126, Medway Road, New Brompton, Kent. The scraper consists of a series of sector-like blades mounted spirally on a shaft having a point screwed on its foremost end.

1901.—**Brackets for Guttering.**—10,272. T. BALLINGER, 32, Victoria Street, Wellington, New Zealand, and W. MILLIGAN, Barker Street, Wellington. The bracket is made of two pieces of galvanised iron folded so as to form feet through which screws can be passed, and with a pivoted hook to clasp the bead of the gutter.

Corner Strips for Plastered Walls.—10,407. W. F. PARKER, 1,135, Broadway, New York. A strip of metal is folded so as to be of T section, and is provided at intervals with clips for fastening to the walls. It projects at the corner and is plastered up level.

Gold Leaf.—11,699. W. H. COE, 230, Westminster Street, Providence, Rhode Island, U.S.A. Instead of being flat, the leaf is held on a reel, thus facilitating its deposit.

The following specifications were published on Saturday last, and are open to opposition until September 24th. A summary of the more important of them will be given next week. The names in italics are those of communicators of inventions.

1900.—12,887, WILLOUGHBY & FOX, crematorium furnaces. 14,417, HARRIS, apparatus for softening water. 14,774, PROCKTER (*Russell & Erwin Manufacturing Co.*), door checks. 16,311, WIGHAM & WIGHAM, means for connecting pipes. 16,494, CHATTWOOD, traps of sewers and drain pipes. 16,598, CLARK, acetylene gas generators. 17,709, HEIDEMANN & AXDORFER, gas burners for heating purposes. 19,853, CSÁKY, SÁRKÁNY & CENTIÀN, acetylene gas generator.

1901.—3,827, TURNBULL, machines for making expanded metal. 4,993, COWAN, gas chandeliers. 6,235, CUSTODIS, chimneys. 6,236, CUSTODIS, round chimneys. 6,375, SEAGRAVE, area ladders. 6,542, RÜHLING, apparatus for heating buildings and for preventing water pipes freezing. 9,468, JENKS, incandescent gas burners. 9,470, COUTURE & ROY, locks and latches for doors. 9,811, JONES & MOORE, flushing cisterns. 10,085, WALLACE & HILTON, sash balances. 10,093, WALLACE & HILTON, window sash balances. 10,104, WALLACE & HILTON, window sash racks. 10,948, ALLISON (*Palmer, Palmer & Palmer*), concrete walls for buildings. 12,296, HODKIN, combination of sinkstone, bath and boiler. 12,582, JANIN & JOLLIFFE, levels and plumbs. 12,610, BOULT (*Roquerbe*), building blocks. 12,633, THOMAS, firegrate. 12,636, JOHNSON (*Wellman Seaver Engineering Co.*), cranes.

EXPLORATIONS IN CRETE.

FURTHER WONDERFUL DISCOVERIES.

FROM time to time we have published reports of the progress made by Mr. D. G. Hogarth and Mr. A. T. Evans with the explorations in Crete. Now Mr. Hogarth has additional discoveries to announce. Speaking of the ruins, he says that the ordinary visitor, not a specialist, will prefer the ruin at Phæstos, on the south of the island, the full revelation of which has certainly been the sensation of the past spring. When Professor Halbherr announced in 1900 that he had begun upon a lesser Knossos no one expected that he and his Italian colleagues were to find in the event a palace more uniform, complete and imposing. What they have now laid bare stands alone in Crete as a spectacle. Even those fresh from the Mycenæ walls and the Treasury of Atreus, or even from Egypt and Syria, must admire the broad staircases and majestic courts of Phæstos, all on so intelligible a plan and preserved to a point which excites without overtaxing imagination.

The Palace of Phæstos.

The ruin covers a promontory of rock. Far below the greatest of Cretan plains stretches to Mount Dicte in the blue distance. Ida hangs right over the site, and through a gap in the screen to west show the snows of Sphakia, all three high masses of the Cretan relief being visible from this one point. In so superb a setting it is the more pity Phæstos should be so difficult of attainment. It may, indeed, be reached in an hour from the sea, but it is from the stormy, harbourless Libyan Sea. A steamer that had landed its passengers in the sunrise calm at Dybáki would often be unable to re-embark them at noon. One must ride, therefore, from Candia, making a three days' expedition, which will include also Gortyna; but the days are long and the paths are rough.

This palace of Phæstos is contained in a vast rectangle, obvious at first sight. There has been an earlier structure, but the building now revealed is of one character and period—that of the acme of the Mycenæan age in Crete. The visitor, approaching from the north, sees from a terrace the ruin below distinguished into three main quarters. On his left a broad stairway descends to a spacious paved court, containing an altar, and tiers of stone built up against the rock, evidently to hold an assembly. Flanking this on the east, and raised high above it, is the main building entered by a truly majestic flight of steps, extending the full width of the fine pillared hall at their head. But the entrance from without is from the opposide side, where a second and larger paved court stretches to the brink of the precipice Thence is admittance not only to the pillared vestibule and main hall, but to a double rank of galleries, and a maze of small chambers to southward, which form the third quarter. This great court, round which the walls and doors are admirably preserved, vies with the region on the west, where the two main stairways meet, as the best point of view on the site. To one standing in it the uses of the various blocks about it are manifest. Here were the living and sleeping rooms of men, there of women. Their common hall of assembly occupied half another side; the store galleries for the produce of the plain fill the other half. In the chambers to south they bathed, worshipped and lodged their retainers and their beasts.

Construction and Decoration.

All this is constructed of an excellent limestone, which has retained its sharp and square outlines, while the Knossian gypsums have crumbled and collapsed. The general impression, therefore, is the more convincing. But in details the inferiority of Phæstos is unquestionable. The elaborate frescoes, the sculptured friezes and the delicate plaster relief of Knossos were never here. Phæstos was provincial. It could command good stone and good masons, but not the materials or the men for the more subtle crafts. The noble shell was decorated only in the rudest manner, and its ruin is not comparable to that of Knossos as a museum of art.

Gorynia.

Certain problems raised by these mid-Cretan excavations it was hoped would be resolved by exploration in the east of the island, the reputed home of the Eteocretan aborigines; but what the Eteocretan capital, however, has failed to produce has come in abundance from two unknown sites, Zakro and Gorynia. These, to compare small to great, stand to one another as Phæstos to Knossos. Gorynia is the more complete and comprehensible. Indeed, it is the most perfect example yet discovered of a small "Mycenæan" town, uncontaminated with later remains, and at this moment after the two great palaces it is the "sight" best worth visiting in Crete. It was discovered by the perseverance of the American lady, Miss Harriet Boyd, who has been directing its excavation. Her workmen have now laid bare two narrow and tortuous streets, paved, and here and there ascending by flights of steps, on either hand of which are preserved to a considerable height houses of stone with party-walls of brick. This style of structure, often suspected on Ægean sites, has never been actually found before. The two streets converge towards a large building of fine masonry on the highest point of the knoll in which it is easy to recognise the house of the local chieftain or governor. The contents of these buildings are as interesting as their structure. If almost everything in precious metal has vanished, everything in bronze seems to have remained in the shape of weapons, tools and vessels. These houses, however, and their contents, though the more intelligible from belonging all to one primitive epoch, are for that reason less instructive than the scantier remains which Mr. Hogarth found at Zakro.

Zakro.

The main site has suffered greatly from denudation, but the ruins of the town show it to have been of more massive character than that at Gorynia. The houses have like party-walls of brick, but their outer walls are true "Cyclopean." They are also of great size; one, for example, was found to contain over twenty chambers, and, utterly ruined though it was, it yielded over seventy vases, besides many fragments and objects in silver, bronze and stone.

The most productive structure lies on the crown of the knoll, a fragment of a large group of connected blocks which probably formed the residence of the chief. In one room of this were found two inscribed tablets and a deposit of bronze implements and vases, among which one with decoration of shells and *marine* stars may claim to be the most graceful of "Mycenæan" ceramic products. Here, too, were found the hundreds of impressions of lost signets, lying in a heap as if once contained in a box. The separate types represented number 150, and illustrate in a remarkable way not only late "Mycenæan" glyptic art but also "Mycenæan" religious symbolism. For instance, several bull-headed human figures are noted, associated in two cases with women draped in the typical flounced skirts of the period, pre-Greek Minotaurs and Ariadnes. So well preserved are these impressions that it has been possible to take casts of them for study in England.

Conclusions.

The general result of east Cretan exploration seems likely to establish the fact that the Pan-Ægean civilisation, which it is agreed to call "Mycenæan," was foreign in that part of the island; and that the native civilisation, existing before and coincident with it, was much ruder than (and perhaps of different character to) that of mid-Crete. If this be really the case, an important inference must be drawn—viz., that the Knossian tablets have probably nothing to do with the Præsos inscription; and that the non-Greek language of the latter, if ever interpreted, will supply no key to the most interesting puzzle that Cretan excavation has supplied.

Builders' Notes.

Mr. E. Manning, of Nelson, has been appointed building inspector to the Coventry City Council at a salary of £130 a year, rising by annual increments of £10 to £150 a year.

London School Board and its Workmen.—The School Board for London has accepted the offer of the Accident Insurance Co., Ltd., 10, St. Swithin's Lane, E.C., to insure the Board from all liability for accidental injury to workmen employed on repairs to buildings and at the furniture store.

Building Trade at Kirkcaldy: Promising Outlook.—The Kirkcaldy Dean of Guild Court have passed plans for a large hotel to be erected near the railway station. Plans have also been approved for the erection of a four-storey block in place of the Victoria Hotel in High Street which will be taken down in connection with the tramway scheme. Several other properties in the High Street are to be reconstructed with a view to widening the street. The building trade in the district is very promising.

The Cement Trade.—The cement manufacturers in the Medway district are anticipating a lull in the foreign demand during at least the next six months. This view is being reflected in a weakening of prices, and there seems to be little doubt that stocks are accumulating. The incident is of interest for the sake of the light it throws upon the probable demand for structural ironwork for new projects in the near future. America itself is coming to the end of its contracts for certain descriptions of rolled steel work, with the result that there is an eagerness to pick up business abroad.

A Glasgow Contractor's Bankruptcy.—Alexander Rennie, sole partner of the firm of R. & W. Rennie & Co., builders and contractors, of Glasgow, was recently examined in bankruptcy. He stated that he had commenced his present business in 1896 with a capital of between £800 and £900, chiefly sunk in plant. His liabilities amounted to £4,235, and assuming that certain outstanding debts would be recovered his assets would amount to £2,340. He accounted for his bankruptcy by contract prices not meeting increased prices of material and increased wages. On one contract alone, that of Provan Gas Works, he lost £1,000, and had ultimately to give it up. The examination was closed.

Lead Poisoning: Professor Thorpe's Report.—Professor Thorpe's official report to the Home Office on the lead compounds used in glazing pottery is really a technical argument in favour of the proposed new rules, or rather one of them, to which the manufacturers have lodged an unqualified objection. In 1898 an enquiry into lead poisoning was instituted by the Home Office, and the special rules regulating the trade were amended. In 1899, as the result of extended enquiry, it was proposed by the Home Office that the use of raw lead should be abandoned, and that all lead should in future be "fritted"—that is, fused with other materials before being ground to form glaze—after the lapse of sufficient time to enable manufacturers to accustom themselves to the change. That proposition was accepted by the manufacturers. The new rules now proposed provide that the fritting of lead shall be made compulsory, and, further, that every fritt shall conform to a certain standard of solubility in dilute hydrochloric acid. Mere fritting is no safeguard against lead poisoning, as the lead contained in the fritt may be readily absorbed. It is assumed that this is not the case if the compound is insoluble in dilute hydrochloric acid, which is taken to represent the gastric juice, and it is further inferred that the less soluble the fritt the more harmless it is. The Home Office, therefore, on the advice of Professor Thorpe, has fixed on a maximum standard of solubility to be calculated on a given formula. Professor Thorpe apparently rests his case chiefly on the facts that certain foreign manufacturers produce ware with glazes conforming to the standard, and that some specimens sent him by English manufacturers for examination also conform to it.

Delays by an Aberdeen Contractor.—At the last meeting of Dundee Town Council mention was made of the delay which had taken place in carrying out the contracts in connection with the extension and reconstruction of the gasworks, and Mr. W. M'Crae, the manager, was instructed to report on the matter. Mr. M'Crae has now drawn up his report. With respect to a contract of Mr. William Anderson in connection with the new retort-house and coal stores, it is stated the contract was accepted on October 23rd, 1899, and according to the specification the work should have been completed five months afterwards. On November 3rd, 1899, Mr. Anderson wrote asking for an extension of time, and this was granted as follows: The north half of the retort-house and coal stores to be completed by April 23rd, 1900, and the south half three months later. The north half was not completed until November, 1900, and the south half until May, 1901. During the execution of the contract, work was greatly delayed on account of bad weather, but Mr. M'Crae considers that the chief cause of delay was the want of bricks. These, the manager understands, were not contracted for, nor were they ordered until shortly before they were required. In all, the works were forty-one weeks late in being completed, and there was a penalty clause in the case at the rate of £20 per week. With regard to the work Mr. Anderson undertook in connection with new chimneys, the report states this contract was accepted on April 6th, 1900, and according to the specification each chimney should have been completed within three months from the date on which instructions to proceed with the work were given. On April 17th Mr. Anderson wrote asking for an extension of time. This was granted, the time for the completion of the chimneys being made six months for the north chimney and ten months for the south chimney, both dating from May 1st. Operations were only commenced on July 24th. The first chimney was completed on May 30th last, being twenty-nine weeks behind time, and the south chimney is now only about 60ft. in height. The penalty in each of these cases was at the rate of £20 per week. The Water and Gas Committee, to whom the report was submitted, are of opinion that a claim should be made against Mr. Anderson.

Surveying and Sanitary Notes.

The Name of London's Great New Street.—The London County Council and its committees having risen for the summer vacation, the name of the new street from the Strand to Holborn will not be decided for some time. The Streets Improvement Committee have received innumerable suggestions as to the nomenclature of the thoroughfare, and have whittled them down until about seventy or eighty remain for the further weeding-out process.

The Property Market.—The Tokenhouse Yard Mart only opened for two days after the August holidays, and the business was of a meagre description, the total sales amounting to £15,100. A small residential estate of 36½ acres in Blyth, Notts, known as Barnby Moor House, sold for £8,000, and Clavering Hall Farm, Essex, comprising 506 acres, realised £14 per acre. The site of the celebrated Blanchard's Restaurant in Beak Street, W., upon which £35,000 is to be spent in rebuilding, was withdrawn at £80,000, bids reaching £77,000. The monthly summary shows that in July this year the sales at the mart amounted to £1,028,760, as compared with £873,430 in the corresponding month last year.

Trees in Whitehall and Parliament Street.—Upon the suggestion of Sir John Wolfe Barry, the Works Committee of the Westminster City Council will consider the practicability of planting trees on both sides of Whitehall and Parliament Street from Horse Guards Avenue to Bridge Street. Should this be successful the north side of the improved Strand will receive similar treatment. In this connection it is interesting to notice the complaints which have again been raised of the extreme enthusiasm among planters for the occidental plane; but it is of small use suggesting alternatives without a knowledge of how London soil suits other trees. During this season two species have flourished beyond others—the acacia and the catalpa. Both are exceedingly beautiful in flower as well as in leaf, and grow to a convenient height, while the plane in a comparatively few years will unduly block up almost any London view. There is no reason why the ash or even the walnut should not do equally well.

KING'S COLLEGE, LONDON.

Result of Examinations in Architecture and Building Construction.

THE following is the list of awards in the examinations in architecture and building construction (evening classes) held at King's College, London, under the joint auspices of the College and the Carpenters' Company (the awards are given in order of merit):—

Building Construction.—Silver medal and £3 in books, F. J. Jones; bronze medal and £2 in books, G. H. Briggs; £1 in books and certificate of distinction, G. Thompson; certificates of distinction, P. Luker, J. J. Crowe, P. J. Black, H. F. Berry, W. Fenn, S. H. H. Ixer; certificates of merit, H. A. Alexander, F. Davies, J. N. Horsfield and J. A. Meikle.

Constructional Drawing.—£3 in books and certificate of distinction, W. Nicholls; £2 in books and certificate of distinction, A. J. Meikle; £1 in books and certificate of distinction, E. L. Hampshire; certificates of distinction, A. Gomme, S. H. H. Ixer, A. Bale and H. F. Berry; certificates of merit, J. J. Crowe, A. Bowles, P. J. Black and G. H. Briggs.

Quantities.—£3 in books and certificate of distinction, F. J. Jones; £2 in books and certificate of distinction, F. Davies; £1 in books and certificate of distinction, H. F. Berry; certificates of distinction, P. J. Black and J. N. Horsfield; certificates of merit, F. Hartnoll, H. A. Alexander and E. L. Frost.

Sanitary Construction.—The Sir George Faudell Phillips medal was not awarded.

History of Architecture.—Silver medal and £2 in books, E. L. Hampshire; bronze medal and £1 in books, A. E. Brooker; certificate of distinction and £1 in books, J. A. Meikle; certificates of merit, J. A. Gillett, W. Fenn, G. W. Rogers and H. Byron.

Architectural Sketching Class.—Bronze medal and £1 in books, A. E. Brooker.

Architectural Studio.—Gold medal and £3 in books, E. L. Hampshire; silver medal and £2 in books, A. E. Brooker.

Wood Carving.—First prize, R. Toms; second prize, H. S. Jones; third prize, M. J. Mathers.

Particulars of the two free scholarships for the evening classes offered by the Carpenters' Company will be duly advertised.

The following is the list of the awards in examinations in architecture and building construction (day classes), for which prizes were given by the Carpenters' Company:—

Architectural History (Third Year).—Silver medal and prize of £2 in books, S. C. Ramsey.

Architectural Studio.—Silver medal and £2 in books, S. C. Ramsey; bronze medal and £1 in books, G. W. Rogers; bronze medal and £1 in books, L. K. Wright.

Architecture and Building Construction.—Silver medal and £2 in books (second year), A. H. Bristow; bronze medal and £1 in books (second year), T. H. Vitty; silver medal and £2 in books (first year), F. R. Fairmaner; bronze medal and £1 in books (first year), S. C. Ramsey.

Architectural History.—Professor's prize for best note-books (third year), G. W. Rogers.

Building Construction.—Professor's prizes for best note-books (second year), L. Baldasano-y-Lopez; (first year), J. P. Katigbak and A. Rodriquez (equal).

Building Construction (Second Year).—Certificates of distinction, W. J. Marlow and O. C. Thompson; certificates of merit, A. H. Imber and E. A. Soames (equal), J. Gardner and E. Karam (equal), E. Woodward, R. M. Smith, G. P. Geen and H. Osmond (equal), H. C. Swayne. (First Year): Certificates of distinction, R. V. Gregory and T. J. R. Kiernan; certificates of merit, J. H. P. Bilbrough, G. H. Rutland, G. W. N. Rose and J. P. Katigbak.

Architectural History.—Certificate of merit, G. W. Rogers.

QUEENSLAND TIMBER.

As may be inferred, Queensland, lying within two zones (10 degs. to 29 degs. South) and with over 2,500 miles of coast, possesses a remarkably rich and varied flora. The dense scrubs frequently bordering the rivers contain trees which supply valuable timber, whose stems are often clothed with superb climbers, and the undergrowth is intermixed with ferns exceedingly beautiful and of almost endless variety. Though there are many beautiful cabinet woods, and woods of great value for railway sleepers and all uses in which endurance is required, still only a very few of the timber trees are at present cut for use, and these are a mixed lot sold under the names of "hard" and "soft" woods. The hardwoods are principally supplied by the eucalypts, and denominated ironbark, gum, box, peppermint, stringybark and turpentine. The soft woods are almost entirely derived from the various pines. Hardwoods are generally obtained in open or forest country; soft woods in the scrub lands on the borders of rivers and the rich moist lands often met with on the tops of the ranges; yet this rich scrub soil often produces some of the very best hardwoods, as, for instance, the Johnstone River hardwood, which is considered second to no timber in Australia for strength and durability; also Thozet's box, one of the most valuable eucalypts found in the scrubs bordering the Fitzroy.

Amongst the hardwoods where strength and durability are required those known as ironbark take first rank. Of these there are several kinds, the best being obtained from *eucalyptus siderophloia*, of which there are two kinds of wood, one red and the other a brownish grey, both excellent timbers, though the red is the favourite; the narrow-leaved ironbark, which has a greyish wood, very strong and durable; and the Palmer River ironbark, better known by the lemon-like fragrance of its leaves, from which it received its local name, than as a timber. The wood of this last, though very hard and of a rich red colour, is usually small and pipy.

The trees known as stringybarks supply excellent timber for sawing and splitting. Nearly resembling these in bark are the trees sometimes called turpentine, a very hard, strong, durable timber.

The timber generally known as gum is furnished by those eucalypts which annually shed their barks, as the blue gum, the poplar gum, the grey gum, the spotted gum, the woollybutt and the Moreton Bay ash. The bark of the last two is persistent at the base. There are also several others called gum trees, but those noticed furnish the best timber. The so-called box is a name under which several trees supplying good useful timber are known, as poplar box, gum-topped box, Thozet's box, and also the Brisbane box.

Two trees are designated bloodwood. The common bloodwood is only adapted for using whole, as it often contains cavities in the wood so full of gum as to render it useless for sawing; it is, however, the favourite timber (on account of its durable nature) for house stumps, piles for bridges, and other works where it can be used uncut. The white bloodwood is very similar, but the wood is of a lighter colour and not quite so durable.

The hardwood of the Johnstone River is furnished by a species of *Backhousia, B. Bancroftii*. This is a very tall erect tree, and so far as is yet known the wood is both durable and strong, does not crack or warp, and is easy to work. The broad-leaved or paper-barked tea-tree; the mahogany—Tom Russell's mahogany, as it is sometimes called—and the swamp mahoganies are timbers of a high quality, though the last mentioned is useless except under water, when it is extremely durable. The hardest wood, however, of Australia is that of *Erythrophlœum Laboucherii*, a tree met with in North Queensland, from the Endeavour River to Normanton. The wood of this tree is a rich red in colour, and takes a high polish.

The soft woods in use are the bunya, Moreton Bay or hoop pine, Dundathu pine, the she-pine, and several of the *callitris* under the name of cypress pine.

For cabinet and ornamental purposes the following are in high request: Red cedar (the Moulmein cedar of the English market, yellow wood and others of this genus, silky oak, deep yellow wood, tulip wood, and beech, a tree attaining a great size. The wood of this last is in great request for verandah flooring and deck planking.

Other woods suitable for cabinet work are: *Elæocarpus Bancroftii*, a tree with a firm light sapwood and a quantity of very hard prettily-marked heartwood, though perhaps its true value will be in its proving a substitute for the American *Lignum vitæ* in the manufacture of blocks, pulleys, &c., than as a cabinet wood; several of the *Evodias*, all having a white pliable wood; the satinwood, one of the most beautiful yellow woods known; *Geijera Muelleri*, a common tree in most Queensland scrubs, having a large quantity of beautifully marked dark heart; *Siphonodon australe*, another scrub tree whose wood is nearly white, very much resembling ivory when polished; the bean tree, growing a heartwood somewhat resembling walnut, but apt to warp in seasoning; the Queensland ebony, a rich-coloured hardwood, very suitable for veneering; the scrub sandalwood, the Australian olive, and many species of acacias commonly called myalls or wattles and remarkable for their rose-like fragrance.

Handsome woods are produced by the "dead finish." The Gulf country gutta-percha and the thready barked oak are very prettily marked and conspicuous for their beauty.

NEW GOVERNMENT OFFICES.

We are glad to see that the protest against the action of the Government in regard to the completion of the new public offices in Whitehall is being ventilated. In a letter to the "Times" Mr. Arthur W. Soames, M.P., says: "It will be within the recollection of your readers that the architect, Mr. J. M. Brydon, who had been selected for the work, unfortunately died before his drawings were completed. It now appears that, from motives of false economy, the Government intend to trust the completion of the designs to the Office of Works instead of following the precedent which was set on the death of Mr. G. E. Street before the completion of the Law Courts, when Sir Arthur Blomfield was appointed to superintend the completion of the building. It is true that the First Commissioner of Works proposes to add Mr. Brydon's chief assistant to his staff for this purpose, and I have not a word to say against this gentleman nor against the permanent staff, who no doubt are thoroughly competent for their own special work, but that work is not the erection of vast buildings of national importance. The character of Mr. Brydon's design is such that its effect when completed will depend, far more than it is easy for the public to realise, upon the proportions of the cornices and mouldings and the design of windows, doorways and innumerable other minor parts of the building. Mr. Brydon was unable to complete the drawings for these details, and if, therefore, this important mass of buildings is to be carried out in a manner creditable to the country it is of the utmost importance that an architect of the first ability should be appointed to complete the designs of one who had been selected with much care from among the foremost members of his profession."

Lord Balcarres supports Mr. Soames. He observes that there is no financial difficulty, as ample provision was made by the Treasury for the architect's fees; £26,000 was allotted for the Westminster buildings, "and I understand that of this amount not much more than £10,000 was spent during Mr. Brydon's lifetime. A very large balance therefore remains, and while we all applaud the wisdom of Mr. Akers-Douglas in appointing Mr. Brydon's chief assistant to continue as draughtsman I feel strongly that the money ought not to be intercepted by the Treasury. The site is one of the finest in London, and it would be deplorable if we save a few thousand pounds and thereby imperil the dignity and refinement of our new Government buildings."

Professor Aitchison suggests that Dr. Rowand Anderson should be invited to complete the building. Another view of the case is taken by an "A.R.I.B.A." in a letter to the "Times." He says that if an architect of note is employed to finish the work he would find it irresistible to impress his own personality on the superstructure, and we should not then have the building as it would have been carried out by the late Mr. Brydon himself. Therefore he considers the Government have taken the right course, for the official architects are "not open to the same temptation."

Engineering Notes.

The Isle of Thanet Joint Hospital at Ramsgate is being warmed and ventilated by stoves and grates supplied by Messrs. E. H. Shorland & Brother, of Manchester.

Caterham Asylum Engineering Contract.—For engineer's work in connection with the extension of the Caterham Asylum the contract of Messrs. Macintosh, Brocklehurst & Co., Ltd., Queen Victoria Street, has been accepted by the Metropolitan Asylums Board.

The Electric Lighting of Worksop.—The completion of the work of laying down the cables and the fixing of standards for the lighting by electricity of the main streets of Worksop, and the building of works for the supply of electric energy, was celebrated on August 3rd by the holding of a dinner.

A New Swiss Railway.—The recent opening of the electric line from Fayet St. Gervais to Chamounix inaugurates a new era for this famous Alpine resort. The new line passes through some very fine scenery, and crosses the gorge of the Arve by the imposing Viaduct of Ste. Marie, consisting of eight arches, 165ft. above the torrent. It also brings Chamounix within four hours of Geneva, fourteen hours of Paris and twenty-one hours of London; and it is expected that the line will be continued to Martigny, there joining the great Simplon route to the Italian Lakes and Milan, thus placing Chamounix on one of the great highways between France and Italy.

New Bridge over the Tyne.—At the last meeting of the Northumberland County Council the Bridges and Roads Committee reported that the surveyor had prepared plans for a new masonry bridge to replace the existing suspension bridge over the Tyne at Warden, about one mile west of Hexham. The bridge would connect that part of the county in the fork of the North and South Tyne rivers with the Hexham district. The nearest bridges, five and four miles up the river, were at Haydon and Chollerford. The new bridge, therefore, would be an important one. The width of the proposed bridge was 21ft. The surveyor estimated the cost at £11.500. The Committee recommended that the Council authorise the erection of the bridge, and the Finance Committee recommended that application be made to the Local Government Board for consent to borrow the money. This was agreed to.

Crystal Palace School of Practical Engineering.—There was a good attendance last Thursday at the Crystal Palace School of Practical Engineering on the occasion of the presentation of certificates. Mr. William Shelford, C.M.G., presided. and among those present were Mr. J. W. Wilson (principal), Mr. Maurice Wilson (vice-principal), Mr. C. F. Fuller (mechanical examiner) and Mr. J. G. W. Aldridge (electrical examiner). The chairman, speaking of the specialisation of engineers' work, said that specialisation was good for the community, but was not always desirable or even possible for civil engineers. Mr. Fuller in his report said he considered the work of the students in the mechanical section extremely good. The work in the pattern and fitting shops showed a high percentage of good work, and the same might also be said of the work in the drawing office. The examiner of the civil engineering section (Mr. R. J. Money) reported that the results of his examination showed that the students were well grounded, and that, while receiving a thoroughly practical training, their theoretical education was in no way neglected. In his report on the electrical section Mr. Aldridge remarked that it was an important feature of that section that the students had as lecturer an engineer engaged on practical work. Electricity was becoming a part of every branch of engineering, and he looked forward to the time when no student would consider his course complete without passing through that section.

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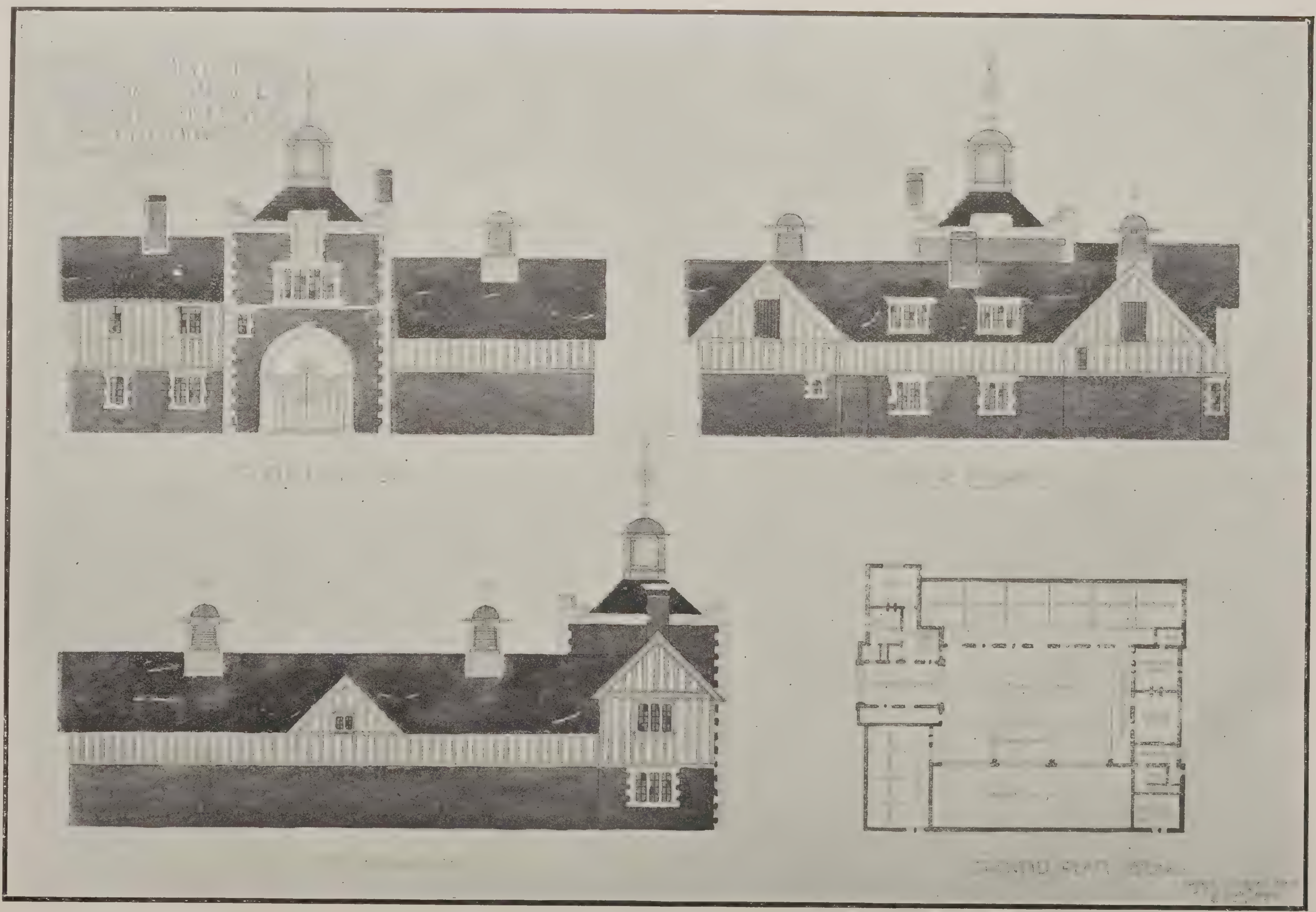

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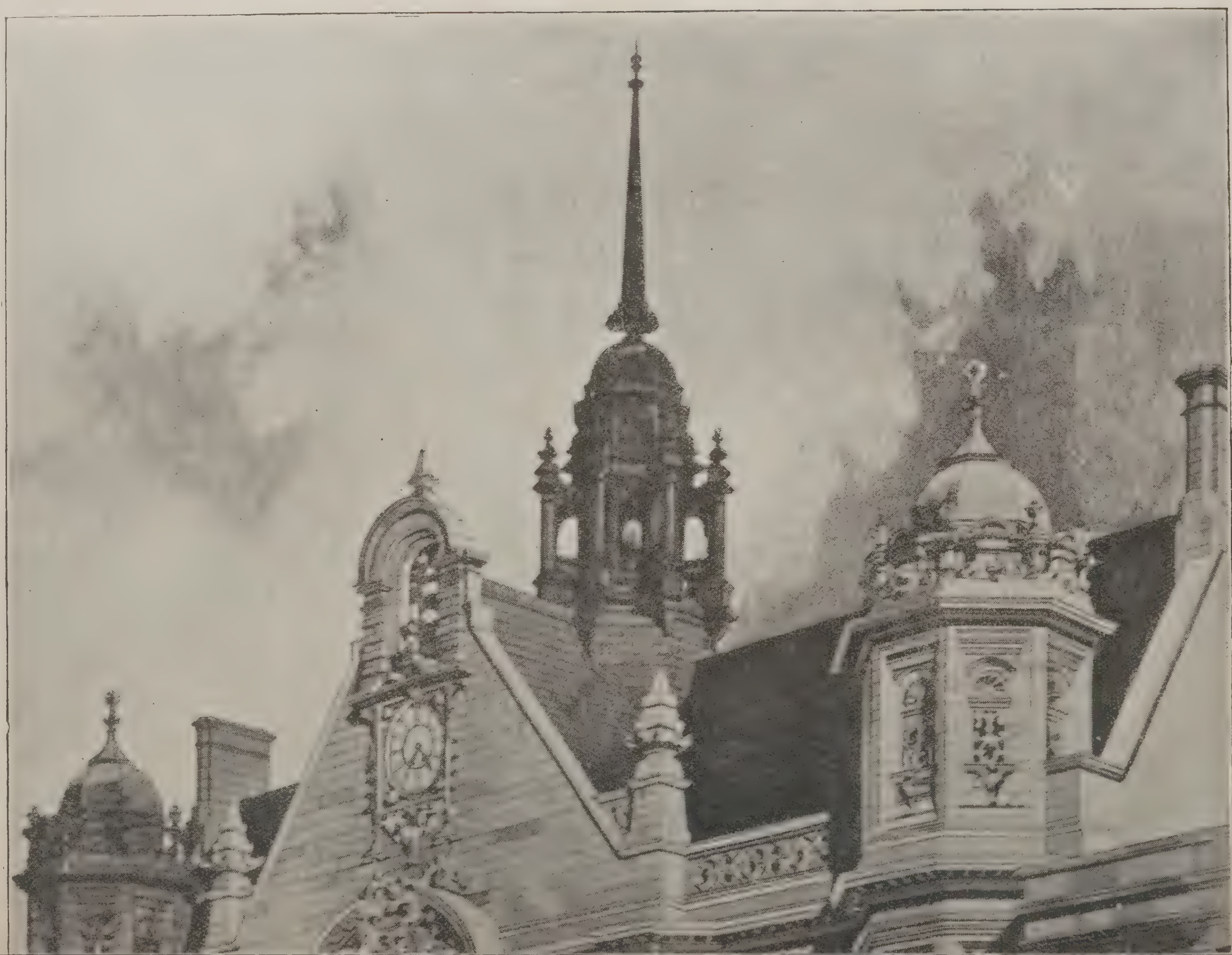
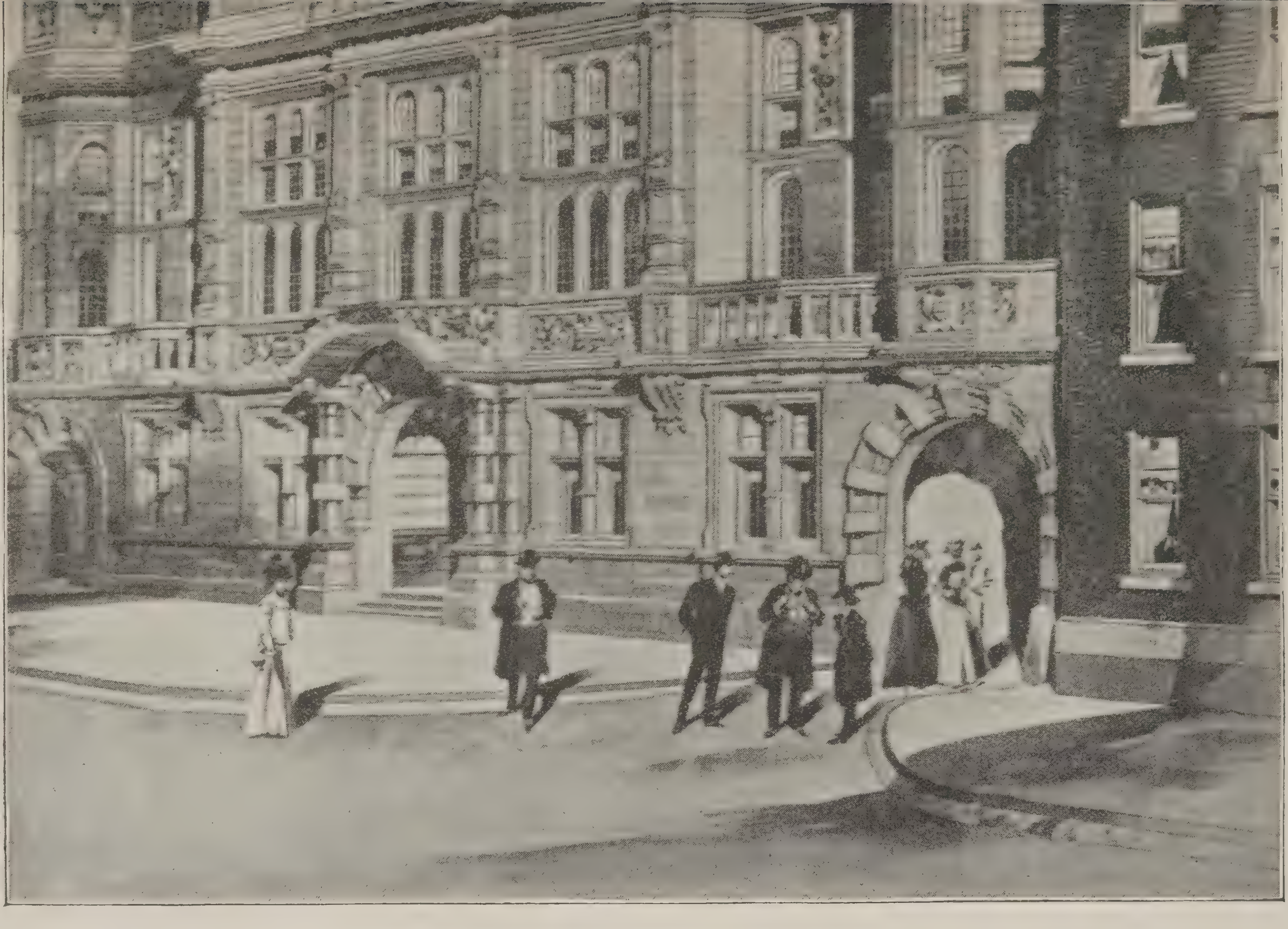
Wednesday, August 14th, 1901.





SELECTED DESIGN FOR NEW MUNICIPAL BUILDINGS AT HEREFORD. Henry A. Cheers, Architect.

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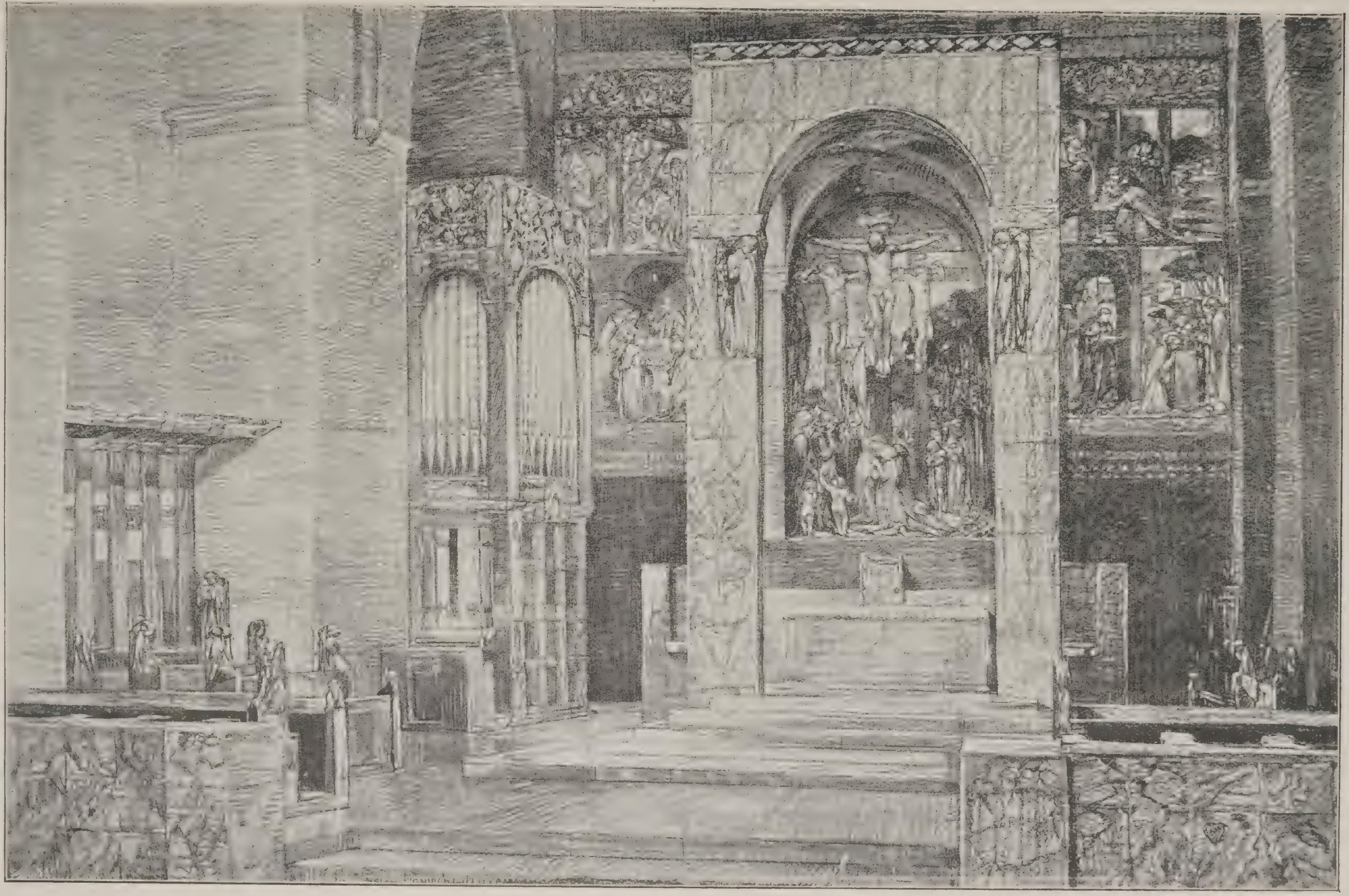

ADDITIONS TO THE CHANCEL OF ST. BARTHOLOMEW'S CHURCH, BRIGHTON. H. WILSON, Architect.

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Bricks and Mortar.

APHORISM FOR THE WEEK.

We laugh when we are told that, among the Ancients, even the Arts were subjected to municipal laws. But we are not always in the right when we laugh . . . The aim of art is pleasure, and pleasure is not indispensable. It may, therefore, fitly be left to the lawgiver to decide what kind of pleasure, and what degree of each kind, he will allow.—LESSING.

Our Plates. THE design for new municipal buildings at Hereford by Mr. Henry A. Cheers, architect, of Twickenham, has been selected. A notice of the competition will be found on p. 500 of our issue for July 31st. We are indebted for our illustration to the "Hereford Times."—The stables at Oakover, Ticehurst, by Mr. Ernest Emerson, have six loose boxes and four stalls, and are now being erected for Mr. Campbell Newington. They are situated on high ground. The stone used is Monk's Park Bath-stone. The half-timber, clock turret and vent turrets are of oak, with domical tops covered with copper. The contractors are Messrs. Strange & Sons, of Tunbridge Wells.—The drawing of the additions to the chancel of St. Bartholomew's Church, Brighton, by Mr. H. Wilson, was exhibited at the Academy of 1898. The design is eminently characteristic of this clever architect.

Mr. Hall Caine and Ruskin. WHEN Mr. Hall Caine, the novelist, left school he was apprenticed to Mr. John Murray, a Liverpool surveyor, who was agent for the Lancashire estates of Robertson Gladstone. Subsequently he acted for a few years as general assistant to a builder, Mr. James Bromley, of Liverpool. It was about this time that he received his first letter from Ruskin in regard to a society newly-formed by Mr. Caine and called "Notes and Queries." Ruskin said: "I have, of course, the deepest interest in your work, and for that reason must keep wholly out of it. I should drive myself mad again in a week if I thought of such things. I am doing botany and geology, and you, who are able for it, must fight with rascals and fools. I will be no more plagued by them."

An Evil Associated with Flats. SPEAKING of the extensive replacement of ordinary dwelling-houses in London by "flats" many storeys high, Dr. John Henry Bridges says in a letter to the "Times": "A very large proportion of flats are built round an enclosed space varying from 10ft. to 30ft. in diameter and from 80ft. to 100ft. in height, forming an unventilated and unventilable shaft. Into this the offices, larders, kitchens, and inferior bedrooms look out, and from it they derive their principal supply of air. At the level of the topmost storey the air may be renewed as the winds pass by; but at lower levels it must remain indefinitely stagnant. The behaviour of bacteria throughout this space I leave to the specialists in this branch of science; but assuredly they will not be dispersed by the natural motion of the atmosphere, nor will they be killed by sunlight. Speaking from a past experience of more than twenty years as a medical inspector in the service of the Local Government Board, I may observe that no such building would be for a moment tolerated by that authority, if proposed for their sanction by any Board of Guardians in the kingdom; and in saying this I do not speak only of Poor Law infirmaries, but of buildings appropriated to healthy inmates. The same thing I should presume from my imperfect knowledge may be said of prisons or of public elementary schools. London has won the reputation, thanks largely to its admirable staff of local medical officers of health, of being one of the healthiest cities in the world. If the present system of building is allowed to go on unchanged, it will assuredly lose that reputation."—Mr. Delissa Joseph, F.R.I.B.A., in reply to the foregoing, says that Dr. Bridges "ignores the fact that since the passing of the London Building Act of 1894 no such areas may be constructed unless approved means for the access of air to the base of such internal courtyards is provided. The suggestion that these areas are at times 100ft. high is also made impossible by the same Act, which limits the height of a building to 80ft. from the street level. The further statement that blocks of flats are 'in a large number of cases constructed in absolute defiance of the best known laws of health' loses sight of the fact that all such buildings are necessarily constructed subject to the Public Health Act of 1891."

Sun Rooms on Town Houses. THE "Hospital" says: "Flat roofs have never attained great popularity in England, although in some workmen's dwellings they are provided. Perhaps the reason has been partly a doubt as to their being permanently weather-tight, partly to the fact that if well made they are heavy to support and expensive to construct; moreover, in the present state of the atmosphere of London, life in the open air is not a constant joy and horticultural pursuits on house-tops are not very attractive. A glass-roofed room or conservatory, however, would be another affair. A glass ridge and furrow roof can be made practically water-tight; it need not be heavy; and if the walls of a roof conservatory are carried to the full height it may be well protected from the ravages of the wind. With such a roof it would be perfectly possible by a simple mechanical contrivance such as is constantly used in greenhouses to throw the whole structure open to the air, and thus, while obtaining protection from the weather when this is needed, to secure all the advantages of open air when the weather is propitious. . . . We notice that at a recent meeting of the American Pediatric Society Dr. Northup reported that by his advice a sun-room had been built on the roof of a private house in New York, a playroom in which fresh air and sunlight can be enjoyed without dust and free from the dangers of the streets. . . . But our suggestion is not merely to build a playroom on the roof, but to make this glass-covered room itself form the roof of the building, much as a weaving shed is made to form the roof of a mill in the textile factories in the North of England."

A Further Effort to Save Christ's Hospital. MR. ASHBEE, chairman of the Committee for the Survey of London, is still in the lists for Christ's Hospital. This, he says, is what we stand to lose by the House of Commons' reversal of the committee's decision to give powers of purchase to the London County Council: "Two, probably three, fine pieces of Sir Christopher Wren's work—the mediæval cloister of the Grey Friars' monastery and the remaining portion of the buildings associated with the memory, perhaps erected by the munificence, of 'Dick Whittington,' that portion of the old mediæval London which has never been built upon; and last, one of the most sacred and historic burial-grounds in London." Mr. Ashbee continues: "It needs very little prophetic power to foretell that in a few years' time, when all the mischief is done and the various commercial interests satisfied, the public will awake to the fact of what it has lost and how it has been fooled, and we shall then hear what we have so often heard before, 'Why were we not warned in time?' It is the hope of this letter, on behalf of the Committee for the Survey of London, to plead for a reconsideration of the whole matter in the public interest before it is too late, and until the Christ's Hospital Bill has passed its third reading it is not too late."

"L'Art Nouveau" Furniture Again. No doubt many will have read with interest the comment on the specimens of "L'Art Nouveau" furniture which have been placed in South Kensington. These are Mr. Vernon Watney's impressions after inspecting them: "Apart from the feeling that a great collection had been degraded, one's impression was patriotic in the sense that it seems hardly fair to our British makers of modern furniture that they should not be allowed equally good opportunities of displaying their wares at South Kensington. One also wonders why the authorities at South Kensington should have huddled together, as if in a lumber-room, our examples of old tapestries, embroideries and furniture (things which have given pleasure to successive generations during the last two or three centuries), while they display, as if in a shop window, those articles for which we are accustomed to look in our more ephemeral exhibitions. It may or it may not be a good thing that there should be in this country an exhibition (permanent or otherwise) of modern furniture; but the artistic side of the Victoria and Albert Museum is full of, and dedicated to, things which have stood the test of the only true touchstone, the test of time, and I venture to join in the appeal to you to let the strength of your columns guard it even from the appearance of being a medium for the advertisements of modern furniture makers."

Bow Church: Wren at Fault. IT having been frequently stated that Bow Church steeple was thrown 1ft. 9in. out of the perpendicular by the construction of the Central London Railway, Sir Benjamin Baker states. on the basis of the experience gained in, driving more than twenty miles of 'tubes,' that no such settlement has ever occurred or ever can occur with the cast-iron tube and shield construction carried out with the usual precautions. "Bow Church steeple is 1ft. 9in. out of the perpendicular, not on account of the Central London Railway but because Wren ventured to build a tower over 200ft. high on no better foundation than an old Roman paved road the stones of which, judging from a similar road which I came across in constructing the Metropolitan Railway, in all probability rested on consolidated mud with occasional layers of brushwood."

The Garden City Association. THE Shoreditch Borough Council has decided to send a deputation to the conference of the Garden City Association to be held at Bournville on September 21st next. The conference promises to be an important affair. Several members of Parliament and representatives from the London County Council and the borough councils are expected to be present and to take part in the proceedings. Mr. Ralph Neville, K.G., will read a paper on "Co-operation in Garden City," and other authorities will deal with education, the liquor traffic, manufactures and housing. It is probable that a public meeting will be organised in Birmingham on the evening of the 20th to discuss the whole housing problem, and arrangements are being made for parties to stay in Birmingham overnight. The total cost for each person will not amount to more than 17s. 6d. for the two days. A limited number of tickets are available for non-members, and any of our readers wishing to be present should communicate at once with Mr. Thomas Adams, secretary, 77, Chancery Lane, W.C. The Garden City Association has been making considerable progress of late, and subscriptions of as much as £60 per annum are being made to its propaganda funds. Among those who have recently given their names as vice presidents are Mr. T. W. Logan, M.P.; Mr. C. E. Schwann, M.P.; Mr. Corrie Grant, M.P.; Mr. Frederick Platt-Higgins, M.P.; Mr. Albert Spicer, J.P.; Mr. J. Williams Benn, J.P, L.C.C.; Mr. A. L. Leon, L.C.C.; Mr. Robert Williams, L.C.C.; Mr. Frank Smith, L.C.C., and Mr. Walter Crane. A Sites Committee was recently appointed, and a practical step may be anticipated in the near future. The association has acquired excellent offices at 77, Chancery Lane, and the secretary cordially invites correspondence from builders and architects interested in the housing question. On August 17th the association will take part in the Housing Exhibition at the Crystal Palace in connection with the Co-operative Festival. Plans and diagrams of the Garden City scheme will be shown, and a number of photographs of Bournville, kindly lent by Mr. Cadbury, will also be exhibited.

Presentation to Mr. John Hebb.—Mr. John Hebb, F.R.I.B.A., who has been in the service of the London County Council and their predecessor the Metropolitan Board of Works for upwards of a quarter of a century, has been presented, in view of his approaching retirement, with a handsome ormolu clock mounted in Algerian onyx, and a pair of chimney vases, by the members of the architect's department of the council. The presentation was made by Mr. W. E. Riley, the architect to the council, on behalf of the subscribers.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Questions should in all cases be addressed to the Editor. The querist's name and address must always be given, not necessarily for publication.

Claims for Extras.

NEWPORT, I.W., writes: "The tender of a builder based on a bill of quantities is accepted by a firm of architects on behalf of their clients, but no contract is signed. The builder acknowledges the receipt of the acceptance and starts the work in due course. A surveyor agreed to by all parties is appointed to measure up the variations and extras and deductions. The accounts contain several extras, and the architects refuse to pay for them, not having ordered the builder to do them, as they should have been done under another separate contract. The architects instruct the builder to charge this latter contractor, but he refuses to pay. In their final certificate the architects leave out the items in dispute. The builder now threatens to make up an entirely new account of his own, ignoring altogether the one made by the surveyor. In what position do the client and architect stand with regard to the builder? What action can the builder take?"

A solicitor should be consulted. He will probably advise that a writ be issued based upon the report of the surveyor, who, if somewhat loosely appointed, appears to have acted the part of an arbitrator. His award is almost certain to be upheld, and the builder would in any case be upon much firmer ground by basing his claim upon it than by making out a new account. G. A. T. M.

Gallery for Chapel.

CAMBORNE.—E. T. H. writes: "It is proposed to erect a gallery in a chapel to hold about 350 persons. Kindly give section and plan of same, with scantlings of timber and joists, and state whether wood or iron would be preferable for girders."

One of the dangers of giving information upon general construction to "all and sundry" is well exemplified in this question. The correspondent wishes to erect a gallery in a chapel to hold from 300 to 400 people, and asks for drawings with scantlings and formulæ; and he gives only a rough sketch plan, not to scale, and with no dimensions. Anyone who can expect a design to be given under such circumstances cannot be competent to carry out the work without supervision, and it is evidently a case in which an architect should be employed. HENRY ADAMS.

Buildings around St. Ives, Hunts, suitable to Measure for R.I.B.A. Examination.

LANCASHIRE.—P. S. W. writes: "Kindly name some buildings in the neighbourhood of St. Ives, Hunts, suitable to measure for the R.I.B.A. Final Examination. Is the porch of the church at Over, Cambridgeshire, suitable?"

The porch of Over Church would serve admirably. The church at St. Ives is a good example of Perpendicular work, and so are those at St. Neot's, Bluntisham, Conington, Ellington and Godmanchester; while those at Hartford, Hemingford Grey and Ramsey are Norman; those at Alconbury, Great Catworth, Keysdon, Warboys and Wooton are Early English; and those at Bythorne, Elton, Eynesbury, Fenny Stanton, Great Stewkley, Hemingford Abbots, Kimbolton, Spaldwick and Yaxley are Decorated. Huntingdon has Early English work at All Saints' and Perpendicular work at St. Mary's.

G. A. T. M.

Using Cross Staff with Compass and Vernier Attached.

CORNWALL.—B. J. S. writes: "I have a very good cross staff with compass and vernier attached. I know both Mr. Middleton and Mr. Usill condemn its use for setting out right angles to chain for offsets; but cannot it be used for taking angles and compass bearing with sufficient accuracy?"

It all depends on what is "sufficient accuracy" for the work on hand. The possession of a compass would render the instrument about as useful as the prismatic compass without its portability; but if it be capable of observing angles other than right angles it might be employed as an approximate theodolite. Sometimes satisfactory work can be done by one having a revolving head and a telescope attached to it; but I have not condemned the instrument generally without ample experience both of good and bad forms. It would be impossible to give hints for the use of any unusual pattern without at least an accurate drawing of it. Probably, to judge from the description given, it would serve very roughly for all the purposes of a theodolite except that it could not be levelled.

G. A. T. M.

Geysers.

MANCHESTER.—CASAL LIA writes: "Kindly give some information about putting a geyser in a house to supply a bath with hot water. What form would be the best, one heated by gas or oil, and what would be the cost?"

Messrs. Ewart & Son, Ltd., of 346, 348, 350, Euston Road, London, state: "If gas is obtainable, this is the most covenient form of heating, and is to be preferred to oil for the simple reason that it gives less trouble. The oil heating we have perfected and the 'Success' oil geyser is eminently satisfactory, but of course the lamp requires to be filled and cleaned, which necessarily is of more trouble than merely lighting the gas when a hot bath is required. For bath heating we recommend the No. 2 size 'Lightning' geyser. If the price is prohibitive an equivalent size in a cheaper form of geyser is the '0' size 'Champion' geyser, which gives good results; or if a low price article is necessary the No. 30B 'Surprise' geyser will probably do all that is wanted."

Bulging Walls.

BANGOR.—W. G. W. writes: "In 1894 the local surveyor served notice upon the tenant of the premises A. (sketch not reproduced) that the front wall had bulged out causing a crack in the cross wall, which was in his opinion unsafe, and requiring immediate attention, but nothing was done. Certain alterations are contemplated to B.'s premises adjoining, the front wall of which is in a similar condition. It is necessary to build a new front wall, and it is certain that A.'s walls will fall in consequence, however well the same may be maintained. The landlord refuses to compromise and will hold B. responsible for damages. Can the local surveyor be compelled to enforce the old notice, and can B. be held responsible for damages?"

The action of the surveyor must depend upon whether he considers the front wall to be now in a dangerous condition. B. might write to the surveyor calling his attention to the present state of A.'s wall, and mention the fact that seven years ago a notice was served respecting its then condition but that nothing has yet been done to remedy the defective structure. Should the surveyor reply that the wall is not now considered to be dangerous, and that no further action is contemplated on the part of the local authorities, then B.'s best course before commencing building operations would be to consult an experienced solicitor, who could make himself thoroughly acquainted with all the circumstances surrounding this particular case. T. E. C.

MR. JACKSON'S NEW SCHOOL CHAPEL AT GIGGLESWICK.

THE new school chapel now in course of erection at Giggleswick from the designs of Mr. T. G. Jackson, R.A., will probably cost not less than £30,000 or £40,000.

It is described as being an experiment in architecture, suggested by Ferguson's remark that the only example of a Gothic dome is that of Ely Cathedral; and the chapel, which is in the late Gothic or Jacobean style, takes the form of a Latin cross surmounted by a copper-covered dome. As approached by a steep path leading from the school the dome is seen crowning the gable walls of the chancel and transepts. From this position the nave is completely hidden, thus giving the building the appearance of a baptistery, illustrating to some extent the effect that would be produced were it possible to place those of Florence or Pisa on a similar elevation. But probably the most remarkable view is that obtained from the high road on entering Giggleswick from Settle at twilight, when the dome is seen over the village roofs, boldly silhouetted against the evening sky, thus presenting a startling resemblance to the approach to some Continental city. On the same plateau as the chapel, but beyond, is the school cricket-ground, with pavilion and gatehouse, both of which are now in course of erection from Mr. Jackson's designs. Seen from the pavilion, the copper-covered dome, which has so far maintained its natural colour, although it was hoped it would soon assume a verdigris hue, is still the same striking feature at close quarters as in the more distant views. The solemn dignity of the dome is undoubtedly assisted by the great variety of design in the chapel itself, together with the use of variously coloured building stones. Those of the walls (said to denote the school colours) are of red sandstone, into which are introduced checkered bands of dark-coloured limestone, and give at some distance the appearance of red brick, which is not altogether agreeable. The dressings and tracery of the windows are of a yellow stone. The chapel interior, which is rapidly nearing completion, has been designed regardless of time and cost. The gold and coloured mosaics of the dome are by Mr. George Murray, and have been executed by Powell & Co. The rich stained glass of the windows is by Burlison & Grylls. The sgraffitto work on the barrel ceiling of the nave and transepts is by Nichols & Stewart, and the carved cedar seating and the black and white marble paving of the aisles by Farmer & Brindly. In all there is a promise of a well-thought-out and pleasing colour scheme. Mr. Richard Evans is the clerk of works.

ASPHALTS.

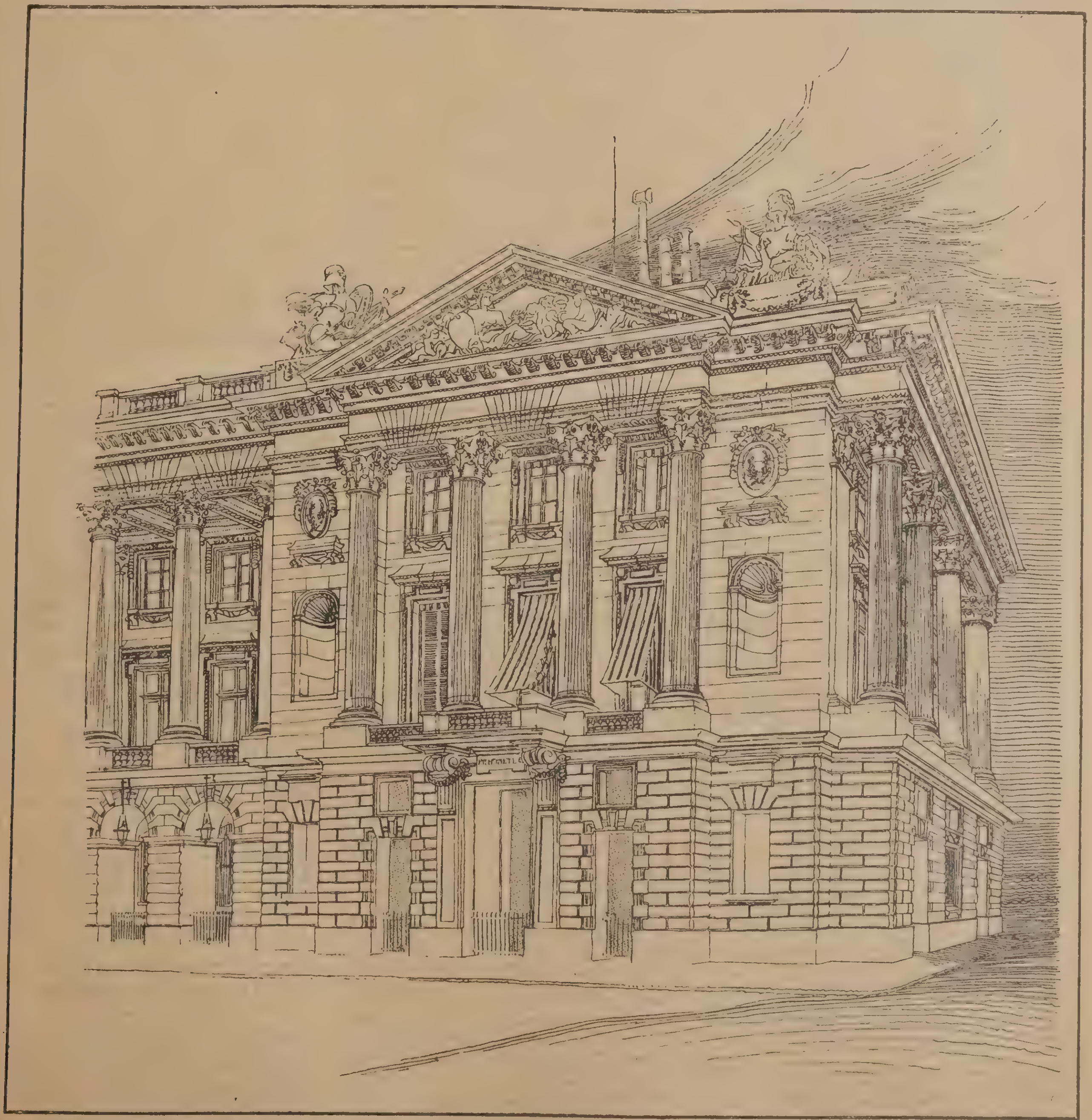
ABOUT 1840 the city of Paris and some other large towns in France made a trial of melted asphalt-rock from the French mines of Seyssel as a material for covering street pavements. The experiment attracted attention, and very soon afterwards the officers of the municipality of Hanover gave directions to the professors of the city technical school to examine the material from the mines of Limmer, which had been abandoned and almost forgotten, to see whether it could be used for street pavements in the manner in which the Seyssel asphalt had been tried in Paris. This leisurely investigation was interrupted by the political tumults of 1848, in which barricades of paving-stones were used as fortifications by the discontented mob of nearly all the large cities of the Continent. Napoleon III., a practical man, like his uncle, bethought himself that if the streets of Paris were paved with asphalt in the manner which had just been tried on a small scale there would be no paving-stones to make barricades of, and by his influence, although not with that avowed object, many miles of asphalt-paving were laid throughout Paris. London, Berlin, Marseilles, and other cities followed the example of Paris, and a great demand sprang up for asphalt-rock. Although London and Paris have now substituted wood-blocks for asphalt in the roadways of their principal streets, the demand for the material continues unabated and fresh deposits are eagerly sought for. At present although the Limmer-Vorwohle mines are extensively worked those of Pyrimont-Seyssel, on the banks of the Rhone, in the French Department of the Ain, hold the first place in regard to the quality of their product. The rock is a carbonate of lime containing from 6 to 8 per cent. of bitumen so intimately combined that it cannot be removed even by long heating. The stone is very uniform, and has a certain toughness which peculiarly adapts it for pavements. The Val de Travers, a few miles distant from Neuchâtel, in Switzerland, furnishes a very similar material. Every architect knows the octagonal and circular blocks in which the Seyssel and Val de Travers asphalts are sent all over the world. For some purposes both these asphalts are mixed with mineral pitch from a mine near Ragusa, in Sicily, owned by the same company as the Pyrimont-Seyssel mines. Lately other asphalt mines have been opened in Southern France—at Marvejols, near Grenoble; at Lovagny, and at Mons, in the Department of the Gard.

HOUSE ON THE PLACE DE LA CONCORDE, PARIS.

THE building illustrated on this page by Mr. H. F. Cooke forms part of one of the two edifices on the west side of the Place de la Concorde, Paris, separated from one another by the Rue Royale, at which point a fine view of the Madeleine is obtained. It is now occupied by the Minister of the Marine. Both buildings were erected from designs by Gabriel during the years 1762 and 1770.

AN ESSAY ON GOTHIC VAULTING.*

ALTHOUGH this book is written expressly to support Mr. T. L. Watson's views upon the vaulting of the crypt or lower church of Glasgow Cathedral, it forms an admirable introduction to the study of Gothic vaulting. The author's claim is that the vaulting of the lower church of Glasgow Cathedral is of various dates, and not of one period and one design. This has been disputed by several recognised authorities on Scottish architecture. We hardly think, however, that after the appearance of this book the fact that the vaulting is of various dates will be disputed. Including the upper and lower vaulting of the choir, five distinct periods have been traced, each being marked by features characteristic of its own period and by different types of mouldings. The middle vault is wholly of a later period than the adjoining aisles. Mr. Watson has endeavoured to trace the original plans in the different stages of the vaulting, and he gives an illustration showing them. His method of arriving at these results has chiefly been to consider the direction of the springers, which are in most cases the first ones, and the altered direction of the ribs from them and also the form of the mouldings. It might be considered somewhat risky to base any reliance upon the mouldings, yet it must be remembered that the course of mediæval architecture was a regular progression, and the mouldings are found to follow each other not only in this case but throughout all Gothic buildings in the same orderly manner. Scottish ecclesiastical buildings until the closing years of the thirteenth century were uniform in style with those of England, but during the fourteenth and fifteenth centuries friendly intercourse ceased and the architecture of Scotland branched off into its own distinctive channel. Thus Glasgow Cathedral being of the earlier date, the author of the book under notice has been much aided by the evidence of dates of certain sections of mouldings in English work, so that this assumption of the dates of various parts of the structure from the sections of the mouldings does not rest upon such insecure foundation as might at first be supposed. Glasgow Cathedral Church seems to have been planned anew three times, each in increased size and elaboration, under Bishops Jocelin, Walter and Bondington respectively. Jocelin's church appears to have been pulled down by Walter, only a few fragments of this twelfth-century building remaining, and these not *in situ.* Walter's project was on such an extensive scale that he was not able to find money enough to complete it in his time; Bondington, however, was more moderate in his demands, and did not attempt to rebuild all Walter's church, but concentrated his attention on the eastern half of the building, which he was able to almost complete within the twenty-five years of his episcopate. The author has, as we said above, not confined his work to proving the variation in date of the vaulting of the lower church, but has extended it to deal with vaulting in general. He says: "As a double vaulted church of the thirteenth century, with clerestory and aisles, the choir of Glasgow Cathedral is unique in this country—in many respects it has no parallel anywhere. Its design is such as to involve constructive difficulties in resolving which the builders were without direct precedent, and the story of the choir vaulting shows by what means these obstacles have been overcome. Its examination discovers to us, in the continuous modification of detail in succeeding



HOUSE ON THE WEST SIDE OF THE PLACE DE LA CONCORDE, PARIS, NOW OCCUPIED BY THE MINISTER OF THE MARINE.
DRAWN BY H. F. COOKE.

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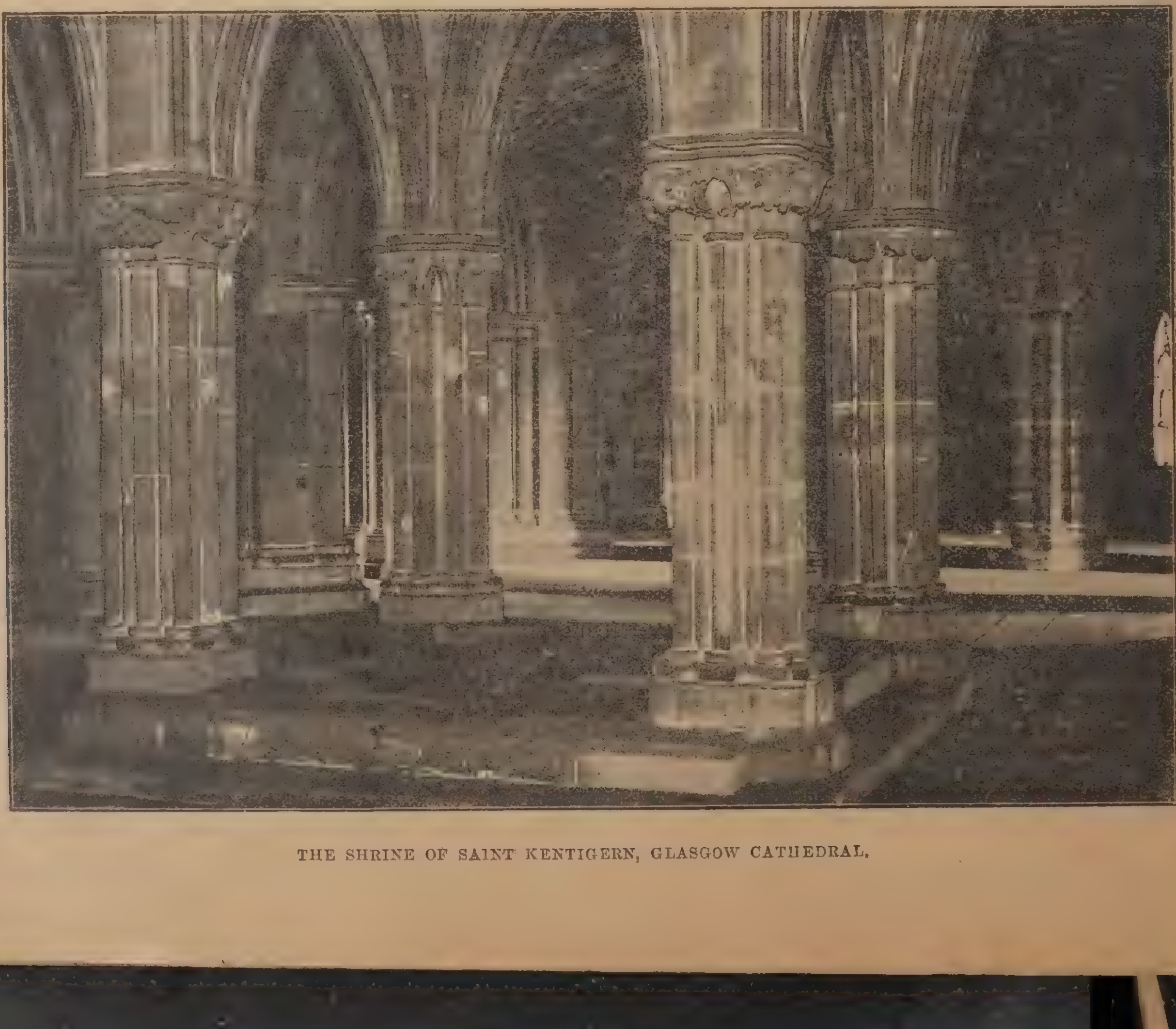
* "The Double Choir of Glasgow Cathedral: A Study of Rib Vaulting." By T. L. Watson, F.R.I.B.A. Price 25s. nett. Glasgow: James Hedderwick & Sons, "Citizen" Press.

stages of the work, something of the process followed by the mediæval builder, while the complete change of design in the middle vault, following upon an interval of only twenty years, illustrates once more the rapid development of the style, and shows on the part of the designer, whether the change was due to his own initiative or to that of others, a sustained effort to improve and perfect his art." This enquiry has led to some revision of the chronology of other parts of the building; part of the lower walls of the nave and transepts, as well as one section of the under-building of the choir, being attributed to the thirteenth instead of to the latter part of the twelfth century. We give an illustration of one original springer to show how the direction of the ribs has been altered; in this particular case it will be noted that the springer of 1240 is of two courses of stone, and at the level of the upper bed, where the work of 1260 commences, the rib is deflected in a very pronounced manner towards the right. In the original portion of the rib there is a clear indication of the direction which it was designed to take on the early plan. Where the old springers have been removed bodily and replaced by new ones, these have been wrought in the majority of cases with mouldings of the later date, while the original springers retain their early mouldings. It is in this way that Mr. Watson has been enabled to plot the three stages of plan illustrated in his book. No doubt, the reason of this change not being recognised before was that the windows of the lower church are filled with modern-stained glass, which makes the interior very dark. The shrine of Saint Kentigern, which we illustrate, was not originally intended to be in the place it now is. The development of the art of vaulting which had gone on after the first projected plan allowed this part, however, when the vaulting was finally carried out, to be given special dignity and emphasis by an elaboration which the builders were not advanced enough in knowledge to do before. Mr. Watson offers an interesting and very probable explanation of the fact that one compartment of the lower church was completed before the rest of the choir building was begun. The mediæval builder worked without heavy scaffolding; the walls were their own main scaffolding. The scaffolding was, in fact, not strong enough to support the heavier materials, which were raised directly from the ground on to the walls. As these were almost always built from the inside, it was necessary that the heavier stones should be wheeled into the building on the level of the ground; and the appliances at the disposal of the builders required that they should be hoisted vertically. The process implied a roadway into the interior of the building, and this is why Mr. Watson thinks the construction of part of the lower church was delayed. This suggestion is illustrated on page 550. He says in reference to this: "A glance at the plan of the lower building will show that no opening of sufficient width could have been formed between the pillars of the north and south aisles. Although only the major pillars of the lower aisles are beneath the pillars of the choir, the smaller intermediate pillars, and the arches which they carry, are necessary to the stability of the structure, and the whole range must have been built at one time. The width between the bases of the pillars at each side of the middle compartment is only 3ft. 6in, and this is manifestly insufficient for the larger loads or even the ordinary traffic of the building. The openings between the eastern pillars, however, offer a clear width of 6ft. 6in. between the bases, and form the only possible access for the hand-carts or other vehicles on which the heavier material had to be conveyed into the middle of the building. The chief part of the dressed stone for the clerestory walls must therefore have been brought in through the two large archways under the eastern gable and by way of the eastern aisle. It follows also that a roadway must have been formed from the exterior of the building into the eastern aisle, and for this purpose one or more wide openings must have been left in the outer walls. This could only have been done by leaving unbuilt the middle piers of the two-light windows of the eastern aisle or of the eastern chapels . . . . the mouldings show that they *were* so delayed. It seems probable that the roadway was carried right through the eastern aisle of the lower church, branching off at right angles into the platform of construction of the middle compartment. By this route the heavier loads could be wheeled in from either side of the building and brought right under any part of the clerestory walls, the stones could be grappled by the lewis and hoisted vertically from the trolley by means of a windlass, and finally settled in their places with the assistance of a short crane or jib. If we assume the mason's yard to have been on either side of the choir, or on both sides, the fall of the ground would lend itself to a slight inclination of the roadway, which would permit of a heavy load being moved with great facility. The window openings of the eastern chapels would give additional means of communication, or they may have been left unfinished mainly for the admission of as much light as possible. It is obvious that if the original plan included the axial ribs which spring from the piers of four of the two-light windows, the vaulting could not have been completed so long as these piers were unbuilt. In any case it was not desirable that the eastern vault should be constructed before that of the middle compartment, as all the light that could be got was required during the completion of the middle vault. Apart, therefore, from the evidence of the mouldings and the necessity for a way into the middle of the building, it would have been a safe assumption that the eastern vault, and not the middle compartment, must have been the last part of the lower vault to be carried out. The evidence of the late mouldings, however, removes the subject from the region of conjecture into that of ascertained fact." It is fairly certain that the aisle vaulting was completed as the building went up, both at the lower and upper levels, as this would be of service in affording facility of circulation to the workmen.

The book is admirably produced, the illustrations are well printed, and the printing of the plans in several colours according to their date serves to render these clearer than would be possible in any other way. The book should be read by all students of Gothic architecture.

A New Day School for Ossett.—Alterations and additions are being made to Bethel Congregational Chapel, Flushdyke, in order that the premises may be used as a day school. Two new classrooms are being built, 22ft. by 18ft. and 18ft. by 15ft. respectively. Plans have been prepared by Mr. George Patterson, of Ossett, and the work is in the hands of the following: Mersrs. J. Ellis & Sons, Ossett, masons; Messrs. Mark Lockwood & Sons, Ossett, joiners; Mr. John Pollard, Ossett, plumber; Mr. A. Wilkinson, Ossett, plasterer; and Mr. George Hargreaves, Dewsbury, slater.



THE SHRINE OF SAINT KENTIGERN, GLASGOW CATHEDRAL.

Law Cases.

SPRINGER IN DOUBLE CHOIR, GLASGOW CATHEDRAL.

Leeds Workhouse Plans: Uncommon Action.—In the King's Bench Division last week Mr. Brooke Little applied for a rule *nisi* for a *certiorari* directed to the justices of the West Riding of Yorkshire, sitting at the Town Hall, Leeds, to bring up a conviction of the guardians of the Hunslet Union to be quashed. Counsel stated that the Local Government Board had sent an order to build a workhouse, and the guardians set about erecting it and continued to do so, but were summoned by the Leeds Town Council for unlawfully failing to deliver to them copies of the plans and sections of the building in accordance with their by-law. That summons was served on the clerk to the guardians on a Saturday, and was returnable on the following Tuesday. Between those dates it was impossible, according to the statutory rules which governed the meetings of the guardians, to have a meeting so that they could be represented before the magistrates, and the clerk instructed a solicitor to apply for an adjournment on these grounds. The justices, however, refused the application, and convicted the guardians in their absence. The justices had no jurisdiction under the by-law, because it did not apply to buildings erected by order of the Local Government Board. Under the Public Health Act, 1875, section 157, an urban sanitary authority had power to make by-laws with respect to buildings and to the deposit of plans, but the last words of the section provided that no by-law made under the section should affect any building erected by virtue of any order of the Local Government Board. The rule was granted.

Water for Swimming Baths.—In the Chancery Division of the High Court of Justice last week the case of *Barnard Castle Urban District Council* v. *Wilson and others* was heard. This was a case of some importance to local authorities supplying water and governed by the Waterworks Clauses Acts, 1847 and 1863, and the Public Health Act, 1875 The plaintiffs were the local authority, and the defendants were the governors of the North-Eastern County School at Barnard Castle. The governors had erected a swimming bath, which held about 35,000 gallons of water, and the plaintiffs contended that the supply of water to it was not a supply for "domestic purposes" but a supply for a "trade, manufacture or business," and that the water ought, therefore, to be paid for at a special rate. Mr. Justice Buckley pointed out that the Acts above-mentioned did not allow an extra charge to be made for private baths, and did not, in fact, refer to baths at all, except public baths and washhouses. He had, therefore, he said, to contrast the words "for domestic purposes" with the words "trade, manufacture or business." The swimming bath was not a business, but a mere incident to the whole business of keeping a school, and he made a declaration that the supply for the swimming bath was a supply for domestic purposes, and ordered the plaintiffs to pay the costs of the action.

Building Mortgages.—The case of *Crouch* v. *Roberts* came before the King's Bench Division of the High Court of Justice last week. This was an action brought under an agreement with reference to the development of the Selly Oak Estate, Birmingham. The plaintiff, a builder, agreed to erect 133 small houses on the estate, of which the defendant was the freeholder. the money for building being provided by means of progressive mortgages. A dispute eventually arose between the parties, and the plaintiff brought an action to recover about £6,000 alleged to be due under the agreement. Defendant denied liability, and counter-claimed for various things, including a sum of £250 alleged to be due as commission for procuring the advance to the plaintiff of a large sum of money to enable him to build on the Bournbrook Estate, Birmingham. The case was tried at the Birmingham Assizes before Mr. Justice Wills and a special jury, and on the findings of the jury the claim was referred to an arbitrator, who found that the plaintiff was entitled to £6,231. Mr. Vachell now applied for judgment for the plaintiff on the report of the arbitrator. He said that it had been agreed that the sum of £250 mentioned in the counter-claim should be struck out and dealt with in another action which was pending. Justice Wills gave judgment for the plaintiff on the claim for £6,231 and costs, and also on the counter-claim, except that part which related to the sum of £250.

Concerning Byron's Birthplace.—In the Chancery Division of the High Court of Justice the case of *Bailey and others* v. *Lewis* was recently heard. The plaintiffs in this action, who were the trustees of the Portland estates, moved for an order to commit the defendant to prison for non-compliance with an order constraining him from erecting on the site of a passage in Holles Street, W., any building or erection other than wings, and from erecting on the site of 16 and 17, Holles Street any building without the plaintiffs' consent, or from altering the premises, or from making any opening in the party wall. The premises occupied by the defendant included 24, Holles Street, the birthplace of Byron. In support of the motion Mr. Vernon Smith, K.C., stated that the defendant was turning private houses into shops in breach of restrictive covenants, the injunction was obtained, and the defendant had done nothing to comply with the mandatory order to restore the premises to their original condition. The motion was ordered to stand over until next sittings.

A Well-known Architect Fined.—In Edinburgh Sheriff Court last week three persons were prosecuted for having begun building operations without first submitting plans and obtaining the necessary sanction. In respect to the charge against Dr. Rowand Anderson, whose agent said he had been building houses at Colinton for over twenty years without submitting plans to any authority, objection was taken to the relevancy of the indictment. This was repelled, and a fine of 7s. 6d. was imposed. Similar penalties were imposed with respect to charges of a similar nature preferred against Samuel Purves, chemist, and James Robb, builder, of Leith.

A Sewage Pumping Station is not a "Sewer."—In the Chancery Division of the High Court of Justice on Thursday last the case of *King's College, Cambridge* v. *The Uxbridge Rural District Council* was heard. This was an application for an interim injunction to restrain the defendant council from proceeding with the pumping station now being erected by them upon a certain strip of land in the parish of Ruislip. The defendant council had resolved to carry out a scheme for this parish by which the sewage was to be conveyed to one common outfall for treatment. Owing to the levels it was found necessary to lift the sewage and pump it along a rising main from Eastcote village to Ruislip village, and for this a pumping station somewhere near the spot in question was necessary. The defendant council, without any notice, were proceeding to erect a pumping station upon this strip of land; and as the plaintiffs also claimed the land and considered that the proposed erection would seriously damage the adjoining land, which was now coming into the market for building purposes, the present action was commenced to stop the defendant council from going on with their works. Mr. Justice Byrne said the question for decision was whether the defendant council had any right, without giving any notice to the plaintiffs, to go on to this land for the purpose of constructing the pumping station; in his Lordship's opinion the defendant council had no such right. The question turned on whether the work the defendant council were now doing was within section 16 of the Public Health Act, which provided that any local authority might carry any sewer through, across or under any turnpike road or any street or place laid out as or intended for a street, and, after giving reasonable notice to the owner or occupier, into, through or under any lands whatsoever within their district. No notice had been given, and a local authority had no right to carry a sewer under private property, as this was, without notice; but then a further point was raised—was this pumping station a "sewer" at all, or was it not rather, within the provisions of section 27 of the Act, an apparatus for the "distributing or otherwise disposing of sewage," for which land could and would have to be purchased; in his Lordship's opinion section 27 applied to the present case, as this pumping station clearly was a means of disposing of the sewage on to another site prepared for it, and it was not a "sewer" within section 16. It would require a great stretch of the imagination to hold that a large building, like this pumping station, was part of a sewer. For these reasons his Lordship thought that what had been done had not been legally done, and that the plaintiffs had made out their case for an interim injunction to restrain the defendants from entering upon or taking this land otherwise than strictly in accordance with their statutory powers, not being powers under section 16.

Copyright in Timber Calculation Tables.—The case of *Greenwood* v. *Barker* was heard in the Chancery Division of the High Court of Justice last Thursday. The plaintiff, J. H. Greenwood, claimed to be the author and duly registered proprietor of a pamphlet or card entitled "Calculator of Prices of Small-sized Timber," and also of a book entitled "Greenwood's Timber Calculator; also How to Check a Timber Merchant's Invoice, the Inch by Inch Method, &c." The defendant, J. R. Barker, recently compiled and published a book entitled "The Timber Merchants', Builders' and Contractors' Calculator," which contains, *inter alia*, (1) tables for pricing timber of various specified dimensions, (2) tables for pricing mouldings, laths, &c., with examples illustrating the same, and (3) directions as to various methods of checking timber merchants' invoices, together with examples illustrating the same. The plaintiff alleged that those tables, directions and examples were either exact copies of or based upon and constituted colourable imitations of matters contained in the plaintiff's card or pamphlet and his book, and that thereby the defendant had infringed the plaintiff's copyright. He accordingly claimed an injunction and delivery up. The defendant alleged that the book complained of was written and compiled by him independently and without any improper use of plaintiff's card or book, and that tables, directions and examples of the same character in all respects as those mentioned by the plaintiff had for many years been well known to and in common use by persons engaged in the building and allied trades, and that the plaintiff had no copyright in any such table, direction or example except in so far as it was the result of independent work by the plaintiff. After hearing the evidence, Mr. Justice Farwell said that unless he was prepared to accuse the defendant of wilful perjury he must believe his account of the compiling of his book, and consequently the plaintiff's action would be dismissed with costs.

AN AMERICAN ARCHITECTURAL SCHOOL.

THE Department of Architecture of the Massachusetts Institute of Technology, Boston, U.S.A., has recently published a very well prepared pamphlet upon its course in architecture illustrated with some excellent collotype reproductions (several in colour) from architectural drawings by students. The Institute of Technology was the first school in the United States to introduce a regular course in architecture. It was established in the year 1866, though it did not graduate its first regular student until 1873. From the beginning the scheme of instruction was based on the method pursued at the École des Beaux-Arts at Paris; and the wisdom of this course has been amply proven during the entire life of the school—a success all the more remarkable when it is remembered that there was no American precedent to aid in the organisation of this important work.

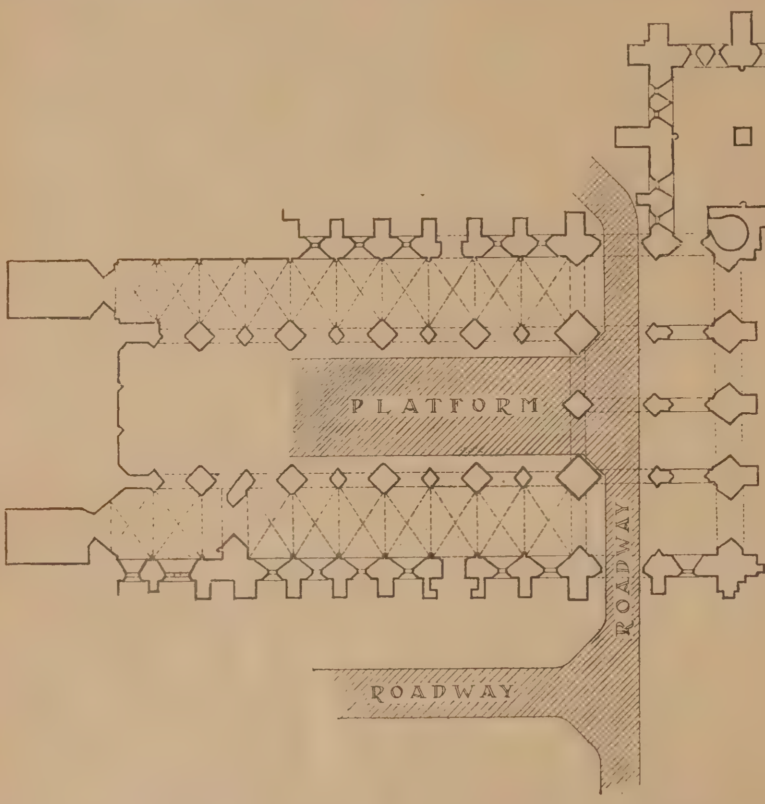


DIAGRAM OF ROADWAY EMPLOYED AT GLASGOW CATHEDRAL.

In the general plan of instruction few changes have been made or demanded. There has been simply a strengthening along the original lines, due to the natural growth of the school. The necessity, at last so universally accepted, of a thorough all-round training for the modern architect, and the steadily rising standard of excellence led in 1891 to the discontinuance of a two years' "Partial Course," previously open as an alternative. Some of the older courses have been modified, and others added to meet new conditions as they occur in architectural practice, but from the beginning there has been no change in the aim of the school. It still demands a thorough training by the Beaux-Arts method, because experience has proved that through this method the student best learns to grasp the principles governing composition and design and to present clearly and intelligently his finished work. These principles can only be developed by continued study of various problems, the result of which will be to give the pupil an ability to achieve grace and elegance in the expression of architectural ideas through an unerring and satisfactory adjustment of the structural parts. When, through exhaustive research and study, the pupil has attained this position, he can be depended upon to think for himself; and in the multiplicity of ideas he will be able to distinguish between the essentials and non-essentials. He will really learn to see and discover for himself that which is beautiful and most worthy of study in the masterpieces of past ages, and the words "archæology" and "art" will gain for him a deeper and more concrete meaning.

This continued exercise serves also to develop an instinct for the beautiful and a power which enables the student to give form to his own ideas. Understanding now the synthesis of architectural things and appreciating the spirit of architecture, he acquires a certain flexibility of imagination, enabling him to solve with straightforwardness the varied and complex problems which constantly arise in professional practice.

One other important method of instruction should be mentioned; that is the co-operation of a number of special teachers and lecturers who, from the highest ranks of their professions, spare time from practice to give the department regular instruction. This direct contact with men acquainted with everyday problems has a most stimulating influence, and also serves the good purpose of keeping the students in touch with the architect's office at the same time that they are following their regular school work.

As architecture stands first in the order of the fine arts, and in its highest development is in the closest alliance with the sister arts of sculpture and painting, the architect's education must not only consist in a broad training in construction and composition, but must also give him the knowledge necessary for ready co-operation with the sculptor and painter when he applies their arts to his buildings. This end is kept in view throughout the course.

The instruction offered in the Department of Architecture is designed to prepare its graduates for the work which they will be called upon to perform in after-life, both at the commencement of their careers as subordinates in architectural offices and in the positions of greater responsibility or independence which they may later succeed in attaining. To these ends manual dexterity and mental accuracy, together with a broad knowledge of technical details, of constructive methods and of modern practice, are of the utmost importance. Throughout the course, therefore, the acquisition of skill of hand and eye, the cultivation of good taste in line, form, colour and design, and the mastery of the principles underlying sound construction, are kept constantly in view.

These in themselves would, however, be insufficient. In no profession are breadth of culture and high mental training of greater value than in that of the architect. Recognising this fact, it is the aim of the department to insure to its graduates a liberal education as well as directly professional training. This is provided for both through supplementary studies of a more general character and by the thoroughness and method with which professional subjects are treated. As the student advances, however, the time allotted to non-professional and disciplinary studies diminishes, while that assigned to professional and fine art studies increases, until in the fourth year his whole energies are devoted to the higher branches which relate to architectural design, construction and the history of art.

The requirements for admission to the first year represent the completion of a good high school course, with considerable attention to mathematics.

Architectural History.

Architectural history is taught by lectures, amply illustrated with the stereopticon, books and photographs. A good knowledge of the great architectural styles is demanded of the pupil, and to this end the striking examples of each style are discussed and studied in the class-room; and the student is made to see that an intimate knowledge of the principles governing design in the Classic, Mediæval and Renaissance work is a necessity, if a proper use is to be made of precedent. This knowledge is stated to be found not only of the greatest use in professional practice, but will also open the way for enjoyable future study and research. Each week the students are required to present for criticism abstracts of the lectures and sketches of the historical monuments discussed. They are also required to test, by comparison with the works themselves, the descriptions and conclusions of the leading architectural authorities, and to prepare careful themes and drawings showing the results of their research. This personal investigation serves besides to give the stutents a good working acquaintance with the exceedingly valuable collection of books and photographs belonging to the department, and stimulates their appreciation of the best architectural works.

The importance of a broader æsthetic and historical training is also recognised and amply provided for. The history of architecture is closely dependent upon the general history and conditions of European civilisation in the ages when the leading architectural styles were developed and perfected. Without a somewhat extended survey of political, ecclesiastical and social history, as well as of architectural history in itself, it is impossible that the essential spirit of Classical, Gothic or Renaissance art should be fully grasped. The ages of highest architectural achievement, moreover, have been also the ages of the greatest distinction in sculpture and painting—arts which of necessity stand in a close practical relation to that of building.

With these considerations in view a course of study has been planned which aims at giving a general survey of the history and characteristics of European civilisation in the Classical, Gothic and Renaissance ages, and at familiarising the student with their sculpture and painting.

The instruction in ornament is closely allied with the history courses, as it not only gives a proper conception of the historical development of ornament and acquaintance with the characteristics of different styles, but it also considers the motives influencing architectural composition and design. Lectures are given, and problems are solved and rendered in black and white and in colour. Each finished design is carefully criticised before the class.

Drawing, Water-Colour, Pen and Ink.

During four years the student has continued practice in freehand drawing, beginning with the cast and ending with the living model. Every means has been taken to make this course efficient and attractive; for ability to draw with proper training produces freedom and skill in design. The valuable collections of the Museum of Fine Arts, enriched by many architectural casts belonging to the Institute, are always open to the students of the department of architecture. Advanced students are regularly assigned work in the museum, which is so close at hand that no inconvenience results from the arrangement. Proficiency in drawing from the cast leads to the day life-class, which is maintained throughout the school year. The benefit derived from continued practice in drawing from the living model cannot be overestimated, since it communicates an accuracy of eye, a perfection of touch, and a facility with the pencil without which one cannot become a master of design. The course in modelling given during the fourth year, after three years' preparation in line drawing, is of great assistance in the proper understanding of architectural details. It includes both the manipulation of clay and casting in plaster. To insure facility in different methods of rendering extended courses are given in water-colour and pen-and-ink drawing. The work is done as much as possible from architectural subjects, to enable the students to associate at once the principles of draughtsmanship with architectural form.

Architectural Design.

The architectural design taught has for its foundation a careful persevering study of Classic work. This is reckoned to be the logical starting-point, because in the Orders culminated all ancient architecture, and in the Orders was the birth of the great styles that developed in later years. It is a study that requires learning, historical knowledge, and great accuracy. The department think this involves all the fundamental principles of design; and there is no concealing of errors, as in the more picturesque styles. This is undoubtedly the weakness of the school, for there can be no real criticism by abstract principles, and can only properly be done with regard to the wrong use of material and upon general moral ethics; the rest is but idle interference with a man's individuality and independence of thought and can but lead to a self-conscious style. The department authorities think that after the student has left school he must undoubtedly meet the world in his own way; but if he has had a solid training in balance, proportion, light, shade, scale and colour, in a style requiring the nicest study of all these elements of good design, he may be trusted to work in any style with which he may later have to do.

The course in design begins in the second year with the history and application of the orders and the study of Classic and Renaissance works. Lectures are given on the proportion and correct use of the Greek, Roman and Renaissance orders, arcades, balustrades, windows and other architectural details. A thorough course in shades and shadows is given concurrently with that of the orders; and the student learns that by applying to his drawings the laws of the projections of shadows he indicates in a degree the third dimension, and at the very beginning he is made to see the importance of light and shade as a factor in the composition of design. To familiarise the student with these forms and the value of the third dimension, and to give him the best possible idea of scale, full-size models of various orders have been prepared, from which measured sketches and accurate drawings are made. Regular exercises in memory drawing on the blackboard not only stimulate the memory and imagination but are of the greatest assistance in teaching the different proportions and value of classic members and mouldings and in the early acquaintance by the students of a knowledge of form. Continued practice is had in the careful and accurate study of Classic detail, rendered in the most truthful and effective manner.

This severe training prepares the way for the broader work of the third and fourth years. Every month two problems are assigned to each class, one a sketch problem, which must be designed and effectively rendered in time varying from one day to one week; the second, a more difficult problem, for which an entire month is allowed. In order to accustom the students to concentrate their minds upon the development of a single idea, instead of wasting their energies in the successive adoption and abandonment of different solutions of the given problem, two days are allowed after the posting of the larger programme of the month, within which time each student must fix upon some general scheme for his design and show his idea by sketch plan and elevation on a small scale. These preliminary sketches are attached to the completed designs, which must correspond with them in all essentials. Judgment is then passed upon the drawings by a jury from the Boston Society of Architects. The designs are afterwards criticised in the presence of the students of the department, the most deserving being indicated by cards of honourable mention and the others marked according to their merits by the instructors.

Continuous studies in planning give the student opportunity to enlarge his resources in this most important part of the architect's work, particular attention being paid to special classes of buildings, such as schools, theatres, churches, hospitals, &c. Opportunities are offered, moreover, for one or two years of advanced study, to be entirely spent in professional work.

Construction and Office Practice.

Scientific construction is continually becoming a more necessary part of the architect's profession. His knowledge must be broad and thorough, and the practice of to-day shows that an architect should not only be a skilled artist but should also be so scientifically trained as to control intelligently all constructive questions.

The mathematical courses in algebra, plane trigonometry, analytic geometry and calculus, and the course in physics, prepare the way for the consideration of professional work in applied mechanics, graphical statics and strength of materials. These are followed in turn by a short course in constructive design, which applies the knowledge obtained in earlier courses to problems often encountered in modern architectural practice. The lectures on history of construction, on the other hand, present to the students the highly-developed methods used by Roman and mediæval builders.

In the second year the principles involved in different methods of perspective and the simpler problems of stereotomy are taught. In the latter course the methods of descriptive geometry, learned in the first year, are applied to the drawing of practical problems in stone-cutting.

The course in materials describes the various elements of modern construction, such as cement, lime, mortar, brick, wood, stone, metals, &c., and their use by the mason, carpenter, roofer and plumber. This practical instruction is supplemented by visits to buildings in process of construction.

The study of working drawings and specifications naturally succeeds the elementary work in materials. Practical instruction is given in making quarter-scale plans and elevations from sketches of wood, brick and stone constructions, and in making the framing plans and working drawings of various kinds necessary in actual practice. Care is taken not to attempt details which may be better learned in an architect's office, but enough is accomplished to enable the student to take immediate advantage of office opportunities upon graduation.

The student is advised to spend a part of the summer vacation, if possible, in an architect's office. What he learns of office practice in this way during the vacations of his course is a great aid to him in the clearer understanding of his school work.

The knowledge acquired from the courses on building stones and on heating and ventilation are of the greatest importance to the practising architect. In the first the characteristics of the various stones used for building are explained, and the stones themselves are tested and tried by the latest experimental methods. In the second course the laws governing the flow of gases are studied. Problems are given to the student like those which arise in actual practice; and the efficiency of warming and ventilating apparatus and devices for controlling and regulating the temperature of buildings are made the subjects of laboratory tests.

The most important elements of the general training which the student receives are the courses in general chemistry and physics, French and German, English literature and composition, political economy, history and business law. These courses vary from a half-year to two years in length. The earlier years also contain several studies of a semi-professional character, which lead in later years to more strictly technical work.

Architectural Engineering.

In recent years opportunity for specialisation has been offered by the introduction of options in architectural engineering and landscape architecture for students not desiring to follow the general course in architecture. The option in architectural engineering meets the demand for men specially trained in the computation of all the details of modern steel construction which occur in the practice of architecture. It diverges from the other options at the middle of the third year, the general architectural training which the student has had during his first years being an important aid to him in his future career. His field of employment will be broader for this knowledge; for as an architectural draughtsman his familiarity with the uses to which a building is to be put, and his ability to take part in the regular routine of the architect's office, will make his services additionally valuable. Lectures and problems on the principles of applied mechanics and lectures in the theory of structures, including loads and reactions, shears and moments, proportioning of beams, columns and tension pieces, the computation of plate and box girders, wooden and steel roof trusses, steel framing, wind bracing, fireproofing, foundations, arches, &c., give the necessary preparation for practical problems in structural design, which forms the important feature of this course. In the fourth year a part of the time is given to laboratory tests on the strength of building materials. Graduate students who have completed the regular course in architecture will also find in the engineering option an attractive field for work.

Landscape Architecture.

The option in landscape architecture offers opportunity for study in a new direction, and the course of study is the result of the fullest co-operation between the Institute instructors and practising landscape architects of the highest rank in the profession. The value of this assistance will be better understood when it is known that no precedent exists on which to base such a course and that the prescribed studies represent the result of personal experience during years of active practice. The landscape architect has heretofore had no opportunity to secure such training for his profession as have the architect and the civil engineer in theirs. It has been necessary to secure the requisite preparation in large part by apprenticeship, as formerly in the older professions. Of late years there has been such a steadily increasing demand in the United States for trained landscape architects, and so much more attention is now being paid to all questions concerning public parks and private grounds, that this profession is believed to offer unusual opportunities. The option begins with the second year of the regular course. In that year it includes horticulture, elementary architectural design, shades and shadows, perspective, freehand drawing, surveying, topographical drawing and dynamical geology, with the usual general courses in physics, language and history. In the third year the same general lines of work are followed, with work in horticulture at the Arnold Arboretum, architectural and landscape design, architectural history and freehand drawing, stadia and plane table surveying, curves and earthwork, highway engineering and structural geology. In the fourth year landscape architecture and design and horticulture are the main features, with courses in sanitary engineering and drainage, building stones and public health sanitation; history of ornament, life-class, modelling, pen and ink, water colour, specifications and working drawings, and business relations. The special instruction in landscape design is conducted by Mr. Guy Lowell, a graduate in the class of 1894, who has since taken the diploma of the Ecole des Beaux-Arts with distinction, and has made a special duty of landscape architecture in Europe.

Graduate Work.

The Institute offers opportunities for one or two graduate years of advanced study, to be spent entirely in professional work. The value of such a course cannot be overestimated, for it allows uninterrupted and continuous study at the time when the students are exactly ripe for it. They are now fitted to undertake problems of an importance equal to those given in the higher class of the Ecole des Beaux-Arts. The subjects chosen for this advanced design are representative of American needs of the day. They are studied as carefully from the practical as from the artistic point of view. With the building proper the surroundings receive equal consideration; and careful study is given in the right understanding of æsthetic requirements, and the designing of the approaches, statues, fountains, terraces and gardens in their proper equilibrium of parts. There could be no better proof of the success of this course than the striking results obtained in the competition held by the Society of Beaux-Arts Architects of New York during the three years when the pupils of the fifth year entered the lists of competitors.

In this advanced work also decorative design takes the prominent position belonging to it when associated with architecture in its highest development, and is carefully studied in the varied relations with its sister arts of painting and sculpture. The extra time allows also an exhaustive study of some archæological problem, consisting of the restoration of Greek and Roman remains or an important study in mediæval Gothic. The fifth year also allows the Institute graduate to round off his practical training with a course in architectural engineering, which will prepare him to solve any constructive problems that come up in the architect's practice.

Summer Work.

Besides the regular work the course of the department also offers in certain subjects summer instruction covering the same ground and given in the same manner as that of the regular classes. The courses are given by members of the department during June and July, and the subjects usually included are design and shades and shadows. Courses in mechanical drawing and descriptive geometry are also available. While these courses enable students who have incurred deficiencies during the school year to make them up before the next term, their principal object is to assist applicants for advanced standing, particularly students coming from other colleges, to complete the preliminary work of the second year with a view to undertaking third-year work to better advantage or even to give them the opportunity to complete the professional work in two years.

In addition to this summer instruction a summer school is held each year for the purpose of bringing the students in contact with the practical side of building, and that they may learn to appreciate the true value of scale and detail. For this purpose localities are visited where buildings are to be found which are important as representative of style or character. These buildings are thoroughly studied, measured and photographed, careful sketches of detail are drawn, and, later, complete drawings are worked out to scale.

St. Margaret's Church, Cley, Norfolk, is said to be greatly in need of repair. The oldest part of the church is the tower, built in the thirteenth century. In the early part of the fourteenth century the work of rebuilding the nave and aisles on a more pretentious scale was commenced. Then came the pestilence of 1349, now known as the Black Death, and the work was suddenly brought to a standstill, and remained, as is supposed, unfinished for 100 years. Towards the end of the fifteenth century an attempt was made to complete the building, but the presumed original design was never entirely carried out. During the eighteenth and early part of the nineteenth centuries decay made rapid progress, and about fifty years ago some "restorations" were effected that were worse than decay. There is, however, much good old work left, and the walls are generally in a sound condition, but the roofs of the north and south aisles call for immediate repair. About £1,000 would effect that, but some £6,000 are needed to put the church in proper condition.

THE EXCAVATIONS AT ST. AUGUSTINE'S ABBEY FIELD.

MR. CHARLES F. ROUTLEDGE, of St. Martin's, Canterbury, appeals for funds in connection with the excavations on St. Augustine's Abbey Field.

This ground contains the ruins of St. Pancras' Chapel, probably built by St. Augustine, and also the eastern portion of the Abbey Church of St. Peter and St. Paul, in which St Augustine and many of his successors were buried, together with the chapter-house, dormitory and infirmary, and the site of the chapel of the Blessed Virgin Mary built by Ethelbert's son and successor, Eadbald. Excavations have been in progress for several weeks past at a cost of nearly £400, a great part of which has been expended in the laborious and costly process of removing the huge mass of earth deposited twenty years ago on the site of the presbytery to the depth of several feet.

The ruins of the early Saxon Chapel of St. Pancras have been completely uncovered, and the chapter-house (80ft. long and 40ft. wide) partially traced; but the chief efforts during the present summer have been devoted to the exploration of the Abbey Church itself. Owing to the devastation caused at the dissolution of the monastery by Henry VIII., and the still more serious vandalism of modern times, when graves were disturbed and building stones carted away for sale or for repairing walls and pigsties, a very small portion of the church above ground is now existing.

The excavators have, however, been fortunate enough to make some important discoveries in the crypt and its adjacent parts, so that the general plan of the Abbey Church is gradually revealing itself.

The large eastern apse is now visible, with its central and flanking apsidal chapels. The central chapel, somewhat altered in shape by subsequent buildings, contains some interesting frescoes on the walls, and in the middle are the remains of an altar highly decorated. Behind the altar is a walled recess, probably used as the place of deposit for valuable relics. The north apsidal chapel, immediately below the shrine of St. Mildred, also contains an almost perfect altar resting on painted tiles, in front of which were found the remains of an abbot which had been enclosed in a wooden coffin, fragmentary pieces of wood and iron nails being still evident.

The south apsidal chapel, beneath the shrine of St. Adrian, is now in process of excavation. The ambulatory at the eastern end of the crypt has been uncovered, together with four pillars of the apse over which stood the high altar.

To the east of the main church is a large oblong chapel erected perhaps in the fifteenth century, encased in a larger chapel, to which it is united by massive buttresses, and containing below the floor level portions of a wall that may possibly have belonged to Saxon times.

Amongst other relics found during the excavations were an enormous quantity of worked ashlar, carved marble fragments and bits of porphyry and serpentine mosaic, with brightly-painted stones, belonging probably to some rich shrines.

The excavations still to be undertaken, comprising the sites of the north and south transepts, the central tower, chapter-house, &c., will entail considerable expense. Besides the £400 already spent, at least £600 more will be required.

Batley Theatre Royal has been entirely renovated and re-decorated by Mr. Tom Hanley, of Branch Avenue, Batley.

At Westwood Edge Church, Golcar, Huddersfield, a new chancel is being built from designs by Mr. Willie Varley, of Slaithwaite. The alterations also include the removal of the old entrance from the centre of the east front, and the erection of a new porch at the south-west corner. The work has been let to the following contractors: Masons, Messrs. Hirst, Firth & Co., Golcar; joiners, Messrs. John Varley & Son, Slaithwaite; plasterers and concreters, Messrs. James Walker & Sons, Slaithwaite; slaters, Messrs. Thomas Allison, Ltd., Milnsbridge; heating apparatus, Mr. R. Rundle, Bradford.

TO NON-INSURED READERS.

From time to time we have queries addressed to us by readers on points affecting our Accident Insurance Schemes. The greater number of the queries relate to the conditions of payment, and to enlighten those who may still be in doubt we think it desirable to state

(1.) That it is not necessary to subscribe direct to the office in order to secure the benefits.

(2.) That even if ordered through a newsagent the subscription need not be prepaid for a year. It is sufficient to order it and pay as may be arranged with the newsagent.

(3.) It is sufficient to have an intimation from the newsagent that he supplies copies regularly.

(4.) That policies can be issued either direct to the subscriber or through the newsagent, whichever may be preferred.

(5.) In applying it is not necessary to write a long letter—a postcard will do, giving the full name and address of the newsagent from whom the copy is obtained.

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£3 per week during confinement from such illnesses as Diabetes, Scarlet Fever, Carbuncle, &c., &c.

If these schemes interest you, write for full particulars to

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Property and Land Sales.

FOLKESTONE, on the West Cliff Estate.—Notice of Sale of valuable Freehold Land (free from tithe and land tax), in a charming situation, near the stations, on the south side of and between the main railway line and the sea.—With possession.—Messrs.

DEBENHAM, TEWSON, FARMER, and BRIDGWATER have received instructions to SELL, at the QUEEN'S HOTEL, Folkestone, on MONDAY, AUGUST 26th, at TWO for THREE, in lots, 50 CHOICE FREEHOLD RESIDENTIAL BUILDING SITES in a lovely position, about 100 feet above the level of the sea, with frontages varying from 40 ft. to 100 ft. to Bathurst Road, Baldric Road, and Turketel Road, at the western side of the Leas and near the new Hotel Metropole, affording an exceptional opportunity for acquiring good FREEHOLD SITES, suitable for the immediate erection of villas and modern marine Residences of a superior character, with gardens and stabling if desired. The roads are all 50 ft. wide and made up and metalled. The sewers and the company's water mains are in. There are great facilities in this beautiful neighbourhood for yachting, sea-fishing, bathing, hunting, and golf.—Particulars and plans of Messrs. TOOMER and CHILD, Solicitors, No. 35, Walbrook, London E.C.; of ANDREW BROMLEY, Esq., Architect, Radnor Chambers, Folkestone; and of the Auctioneers, 80, Cheapside, E.C.

To Builders, Tradesmen, Small Capitalists, Plot Buyers, Careful Investors, and others. Important Land Sale of 79 valuable Freehold Building Plots, choicely contained of the Church Fields Estate, with splendid frontages to East End Road and Church Lane, East Finchley, a few minutes' walk from East Finchley Station, G.N.R. (frequent trains from King's Cross, Moorgate Street, and Broad Street), offering splendid sites within six miles of London for the erection of medium sized Villa Residences, or the creation of Ground Rents. Free Conveyances. Payment by instalments. Roads made. Sewers laid.

MESSRS. RANDALL, COX & BAKER, will SELL by AUCTION the above at the BALD FACED STAG HOTEL, East Finchley, on WEDNESDAY, AUGUST 21st, 1901, at HALF-PAST SIX p.m. precisely.

Particulars, plan, and conditions of Sale may be obtained of Messrs. POWNALL & CO., Solicitors, 9, Staple Inn, W.C., and of Messrs. RANDALL, COX & BAKER, Auctioneers and Land Agents, East Finchley, N., and Woodside Park, North Finchley, and Mr. S. H. BAKER, 62, Coleman Street, E.C.

CORNWALLIS ESTATE, LOWER EDMONTON, a few choice plots suitable for Shops, either freehold, or in ground rent; plan and particulars.—D. CHAPMAN, 79, St. Bees Street, Moss Side, Manchester.

MISCELLANEOUS.

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BUILDER'S BUSINESS.—One of the oldest in the Midlands (½ century) for sale. Goodwill only £100. Stock, plant and premises, if desired, at valuation. Chance of a lifetime for a beginner. – A. B., Box 1746, BUILDERS' JOURNAL Offices, Effingham House, Arundel Street, Strand, W.C.

TO ARCHITECTS AND SURVEYORS.—An Old-Established Country Practice for Sale in the South of England; good reasons for giving up same.—Address, ARCHITECT and SURVEYOR, Box 1736, BUILDERS' JOURNAL Offices, Effingham House, Arundel Street, Strand, W.C.

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R.I.B.A., Society of Architects, Surveyors' Institute (Building Section), and Civil Service Technical Examinations. Preparation by correspondence or in residence.—MIDDLETON & CARDEN, 19, Craven Street, Strand, W.C.

R.I.B.A. EXAMS. PREPARATION, personally or by correspondence, in three, six, nine, or twelve months' courses. Architectural Lending Library. Special three months' finishing courses.—For full particulars apply to Messrs. HOWGATE & BOND, Associates R.I.B.A., 115, Gower Street, W.C. (close to the British Museum).

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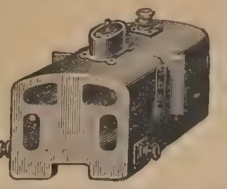

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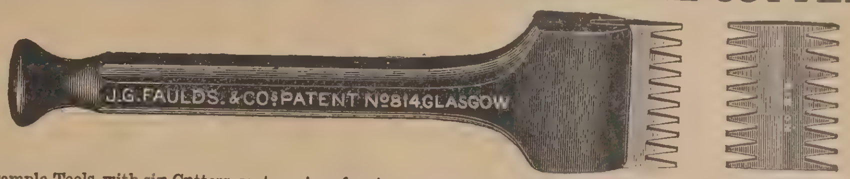

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J. G. FAULDS & Co., 48, North Frederick Street, GLASGOW, N.B.

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ASSISTANT disengaged, six years' experience in office and on works, well up office routine, quantities, levelling, &c.; qualifying P.A.S.I.; first-class certificate building construction.—"THEODOLITE," Box 1750, BUILDERS' JOURNAL Office, Effingham House, Arundel Street, Strand, W.C.

ADVERTISER seeks POSITION as CLERK in Architect or Surveyor's office; Shorthand (100); neat Tracer; Moderate Salary.—Box 1712, BUILDERS' JOURNAL Office, Effingham House, Arundel Street, Strand, W.C.

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CARPENTER AND JOINER wants work at bench and fixing or on private estate.—Apply ALLISTER, Throckenholt, Wisbech.

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WORKING FOREMAN CARPENTER AND JOINER seeks SITUATION on gentleman's estate. Late employer the Earl of Darnley.—F. J. ANSELL, Cobham, Gravesend.

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TENDERS.

Information from accredited sources should be sent to "The Editor." Results of tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

ABERGAVENNY.—For taking down the present farmhouse and the erection of a new house, with outbuildings, stabling, and other conveniences at Bowlers' Barn Farm, near Abergavenny; also for the erection of an additional boiler-house and chimney shaft, 112ft. high at the Asylum, and other works. Mr. B. J. Francis, architect, Abergavenny:—

Bowers & Co., Hereford	£5,623	9	6
W. T. Sier, Newport	4,407	16	11
D. Thomas & Son, Cardiff	4,400	0	0
P. Gaylard, Bridgend	4,358	12	0
J. G. Thomas & Sons, Abergavenny*	4,207	0	0

* Accepted.

ADDLESTONE.—For the erection of a new school to accommodate 300 boys, for the Addlestone School Extension Committee. Mr. Horace C. Fread, architect, Molesey:—

J. W. Young	£2,870	0
W. G. Tarrant	2,339	0
Highby & Rabson	2,311	7
R. Atkinson	2,167	10
W. H. Taylor	2,134	10
E. Chamberlain	2,134	0
C. Horsell	2,050	0
W. H. Gaze & Sons	2,048	0
W. Greenfield, Weybridge*	2,033	15
Willis & Dickinson	1,939	6

* Accepted.

BLACKBURN.—For extensions to electricity works, Jubilee Street, for the Corporation. Messrs. Lacy, Clirehugh and Sillar, consulting engineers. Mr. A. S. Giles, engineer, Jubilee Street, Blackburn:—

J. Knowles	£16,550	0
S. & J. Whitehead	16,300	0
Wilson & Son	16,186	0
Marshall & Dent	16,155	10
Lewis & Son	16,060	0
Keeley & Son	16,017	0
D. Smith	15,831	6
R. Shorrock	15,800	0
Fecitt & Sons	15,775	0
Highton & Son	15,700	0
J. Cronshaw	15,600	0
Higson & Sons	15,350	0
Whittaker & Sons	15,084	0
J. Boland	14,910	0
W. J. Woof, Cronshaw*	14,884	0

* Accepted.

BODMIN.—For extensions and additions to the Cornwall County Lunatic Asylum. Mr. Silvanus Trevail, F.R.I.B.A., architect, of Truro, and Palace Chambers, Westminster, S.W. Quantities supplied:—

Wakeham Bros., Plymouth	£121,087
J. Shillitoe & Sons, Bury St. Edmunds	111,176
W. King & Son, Westminster	102,700
C. Brealy, Exeter	101,856
T. Rowbotham, Birmingham	101,500
A. E. Skinner, Plymouth	99.156
H. Willcock & Co., Wolverhampton	94,300
J. & M. Patrick, Wandsworth	94,009
A. Krauss & Sons, Bristol	92,335
A. H. Coles, Stonehouse	92,105
R. Wilkins & Sons, Bristol	90,850
W. E. Blake, Plymouth	90,193
S. Trehane, Liskeard	88,795
Pethick Bros., Plymouth*	87,973

* Accepted.

BOWDON.—For alterations and additions to the Lancashire and Yorkshire Bank. Mr. Jesse Horsfall, F.R.I.B.A., architect, 4, Chapel Walks, Manchester, and Todmorden:—

John Bland, Manchester.*

* Accepted.

BRIDLINGTON.—For laying about 1,155yds. lineal 9in. stoneware pipe sewers, 1,555yds. lineal 12in. stoneware pipe sewers, 982yds. lineal 15in. stoneware pipe sewers, 652yds. lineal egg-shaped sewers (varying in size from 4ft. 6in. by 3ft. to 3ft. 3in. by 2ft. 2in.), and 459yds. lineal 24in. cast-iron pipe outfall sewer, together with the necessary manholes, &c. Mr. E. R. Matthews, C.E., borough engineer:—

H. Tyson, Halifax	£14,126	13	1
B. Cooke & Co., Westminster	11,312	0	0
B. Graham & Sons, Huddersfield	11,295	15	0
J. Bentley, Bradford	9,818	17	3
J. Akeroyd & Son, Birstall	8,993	0	0
T. Sangwin, Hull	8,444	0	0
T. C. Starkey, Hull	8,111	15	0
B. Robinson, Hull	7,802	9	4
C. W. C. Pearson, Hull*	7,771	18	4

* Accepted subject to the Local Government Board giving their sanction to an additional loan of £2,000.

CHAILEY (SUSSEX).—For the erection of an isolation hospital, caretaker's house, and other works, for the Chailey Rural District Council. Mr. Henry Card, A.M.I.C.E., architect, 10 North Street, Lewes:—

Young, East Grinstead	£4,993
Finch, Hayward's Heath	4,899
Cook & Son, Crawley	4,813
Box & Turner, Ardingley	4,620
Turnbull & Co., Horley	4,600
Norman & Burt, Burgess Hill	4,493
Wells, Plumpton	4,474
Peerless, Dennis & Co., Eastbourne*	4,244

* Accepted.

CHELTENHAM.—For the erection of a Home for Sick Children. Messrs. H. A. Prothero & G. H. Phillott, architects, 13 Promenade, Cheltenham:—

Saunders & Son	£4 833
A. C. & S. Billings	4,752
Collins & Godfrey	4,435

COVENTRY.—For additions, &c. to Park Fields, Allesley, for Mr. J. Mayfield. Mr. F. Foster, architect, Hertford Street, Coventry. Quantities by architect:—

J. Worwood	£1,767	0	0
C. Haywood	1,750	0	0
C. Hope	1,642	0	0
Harper & Son	1,617	0	0
C. Gray Hill	1,600	0	0
C. Garlick	1,465	0	0
A. Beacham	1,405	12	9
V. A. Pearson, Earlsdon, Coventry*	1,326	0	0

* Accepted.

CWMBRAN (MON.)—For the erection of a girls' school, for the Llantarnam School Board. Messrs. B. Lawrence & Son, architects:—

Mainwaring, Cwmbran	£4,455
Leadbeter, Newport	3,893
Poulton & Whiting, Cwmbran	3,785
J. Davies, Newport	3,684
J. Jenkins & Son, Newport*	3,525

* Accepted.

DEVONPORT.—For the erection of No. 68, Free Street. Mr. H. G. Luff, A.R.I.B.A., architect, Devonport. Quantities supplied:—

Wakenham Bros.	£2,167	0
Thos. May	2,125	0
Pearn Bros.	2,119	0
Littleton	2,107	0
Smith & Son*	2,039	15
Jenkin & Son	2,035	0

* Accepted.

DEWSBURY.—For the erection of four houses in Thornhill Road, West Town, for the Dewsbury Pioneers Industrial Society, Ltd. Messrs. Holtom & Fox, architects, Corporation Street, Dewsbury. Accepted tenders:—

Mason, G. Broadbent, Ravensthorpe	£678	4	11
Joiner, T. B. Bailey, Dewsbury	229	0	0
Plasterer, A. & F. Hodgson, Dewsbury	76	10	0
Plumber, J. Stead, Batley Carr	50	0	0
Slater, W. H. Thompson, Batley	44	10	0
Painter, S. Oldroyd, Batley Carr	14	5	0

Total, £1,092 9s. 11d.

ELLERSTONES GREETLAND.—For the erection of a house for Mr. George Wood. Messrs. Walsh & Nicholas, architects, Halifax. Accepted tenders:—

E. Naylor & Sons, masons.
W. Calverly, joiner.
J. Riley, plumber.
J. Firth, slater.
J. Firth, plasterer.

HERTFORD.—For laying about 2,000 ft. of 15-in., 12-in. and 9-in. stoneware pipe sewers, with manholes, &c., and other work, for the Corporation. Mr. J. H. Jevons, A.M.I.C.E., borough engineer:—

Wallace & Inns, Hornsey (corrected total)	£1,756
Meston & Hale, Harlesden	1,251
G. F. Tomlinson, Derby	1,136
A. C. Soan, Streatham (corrected total)	1,110
J. Jackson, Forest Gate	1,102
G. Porter, Tottenham	1,090
A. T. Catley, London*	1,086

* Accepted.

LEEDS.—For the erection of a branch free library, police stations and fire stations at the corner of Dewsbury and Hunslet Hall Roads, for the Corporation. Messrs. Bedford & Kitson, architects, Leeds. Accepted tenders:—

Mason & bricklayer, F. O. Farrall	£4,831	15	0
Carpenter & joiner, B. Wood	1,891	18	6
Plumber & glazier, J. E. Bedford	1,143	17	6
Plasterer, W. Elsworth	562	8	10
Slater, W. Atkinson	169	18	0
Painters, Roylance & Horsham	77	8	4

LONDON, S.E.—For additions to the Convent of Notre Dâme, St. George's Road, Southwark. Mr. J. C. Radford, architect. Quantities by Mr. H. F. Williams:—

Holloway Bros.	£10,577	H. Roffey	£9,472
Martin, Wells, & Co.	10,139	Gregory & Co.	9,365
Perry & Co.	10,089	Patman & Fotheringham	9,237
Colls & Sons	9,843	Marsland & Sons	9,212
Godson & Sons	9,800	T. Blackmore	8,598
Adamson & Sons	9,581	F. G. Minter*	8,595
Carmichael	9,494		

* Accepted subject to deduction of some provisional amounts.

MAIDSTONE.—For the erection of a shop and seed warehouse for Messrs. Harrison & Sons. Mr. Hubert Bensted, F.R.I.B.A. architect. Quantities by Mr. H. T. Barnes:—

Elmore & Sons	£1,960
Corben & Co.	1,947
Cox Bros	1,836
Wallis & Sons*	1,793

* Accepted.

MANCHESTER.—For alterations and additions to the Lancashire and Yorks Bank, Levenshulme. Mr. Jesse Horsfall, F.R.I.B.A., architect, 4 Chapel Walks, Manchester, and Todmorden:—

J. Helen, Levenshulme.*

* Accepted.

ROCHDALE.—For extensions to the Free Library and New Art Gallery. Mr. Jesse Horsfall, F.R.I.B.A., architect, 4 Chapel Walks, Manchester, and Todmorden:—

Ashworth & Woolfenden, Rochdale.*

* Accepted.

ROSS (HEREFORDSHIRE).—For alterations and additions to "The Upper Baches," Upton Bishop, for Mr. Alexander F. Cox. Mr. Arthur P. Small, architect, Ross:—

W. Bowers, Hereford	£1,209	0
W. E. Lewis, Ross*	1,076	10

* Accepted.

RYDE (I.W.).—For the erection of a cottage at High Park for Miss E. Jones. Mr. John T. Barton, architect, Ryde:—

J. Newnham	£435	0
A. T. Brading	415	0
Wheeler Brothers, Ryde*	413	10

* Accepted.

TODMORDEN.—For the erection of four houses on the Stansfield Hall Estate. Mr. Jesse Horsfall, F.R.I.B.A., architect, 4 Chapel Walks, Manchester, and Todmorden. Accepted tenders:—

Masons, Drylands & Preston, Littleboro.
Carpenter & joiner, T. Greenwood, Todmorden.
Slater, J. F. Ford, Manchester.
Plumber, &c., R. H. Ingham, Todmorden.
Plasterer, T. Black, Todmorden.

WARSOP.—For the erection of cottages for Mr. H. Marlows. Messrs. Vallance & Westwick, architects, Mansfield:—

A. Eastwood	£629	C. G. Percival	£565
Vallance & Blythe	610	J. Collingham*	560

* Accepted.

WOKING.—For the erection of a detached house in Albany Road, Horsell, for Mr. Stanley Tibbenham. Mr. William G. Jones, M.S.A., architect, Woking:—

Drowley & Co., Woking		£1,281
J. Harris & Son	,,	1,180
G. Allard*	,,	1,150
W. Roake	,,	1,149

* Accepted.

WOODFORD (ESSEX).—For repairs, re-painting and cleansing works in connection with the Churchfield Schools. Mr. Edward Tidman, C.E., architect to the Board, Connaught Mansions, Westminster:—

H. Wells	£155	0
Osborne	126	0
Poole	125	3
F. Ranger*	124	10

* Accepted.

Also for similar work at Woodford Green Schools:—

H. Wells	£140	0
Osborne	129	0
Poole	124	1
F. J. Hill	73	0
F. Ranger	62	0

COMING EVENTS.

Saturday, August 10, to Saturday, August 17.

INSTITUTION OF JUNIOR ENGINEERS.—Summer Excursion to Plymouth and Devonport.

Wednesday, August 14.

INSTITUTE OF SANITARY ENGINEERS.—Examination and Literary Committee, 3.0 p.m.; General Purposes and Finance Committee, 4.0 p.m.; Council Meeting, 7.0 p.m.

Thursday, August 22.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Excursion to Parson Byres Quarries, leaving Newcastle Central Railway Station at 10.5 a.m.

Saturday, August 24.

ARCHITECTURAL ASSOCIATION.—Fifth Summer Visit, to the Presbyterian College, Cambridge.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to South Shields.

Saturday, August 31.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.

Tuesday, September 3, to Friday, September 6.

IRON AND STEEL INSTITUTE.—Autumn Meeting at Glasgow.

Saturday, September 7.

ARCHITECTURAL ASSOCIATION.—Sixth Summer Visit, to Wakehurst Manor, Ardingly, Sussex.

Tuesday and Wednesday, September 24 & 25.

CHEAP DWELLINGS CONGRESS in the Council Hall, Glasgow.

Trade and Craft.

Electric Pulley Blocks.

Mr. Thomas Veasey, of 5, Copthall Buildings, London, E.C., is the sole representative for the United Kingdom and Colonies of Averly's electric pulley blocks. For engineering, steel and iron works, machinery erecting, building and contractors' work, these offer many advantages. They have been adopted by the French Ministry of Marine at the principal Government dockyards, by the French National Cannon Foundry, the steel works of Firminy, Messrs. Marrel Frères, the leading metallurgical factories of the Loire, and other firms. The block consist of an improved lifting mechanism driven by electricity. One man can lift and manœuvre weights of from 1 to 20 tons with the greatest ease; and as the blocks are of very little weight compared with ordinary travelling bridge cranes and lifting apparatus, they can be moved with greater facility, at greater speed and require less power. Their reduced bulk and weight effect a considerable saving of space and freight, rendering them also especially applicable for Colonial requirements. Prices range from £60.

Water Softeners.

The Lawrence Patent Water Softener and Sterilizer Co., Ltd., of Norland Works, Uxbridge Road, Notting Hill, W., have a patent hot process for softening water for every purpose, including boiler feed, drinking, brewing, laundries, &c., without the use of chemicals. In this process steam is generally used as a heating medium, and by means of the heat interchanger the consumption is reduced to a minimum, as the hot soft water on leaving the boiling vessel is cooled by the incoming cold hard water, and leaves the apparatus within 15 degs. of its original temperature. The hard water is thus heated in the interchanger by the usually wasted heat of the softened water, and ultimately enters the boiling vessel at about 180 degs. Fahr. The heat required therefore is only that sufficient to raise the water through about 35 degs. Fahr., allowing for small losses by radiation, &c. The cost of working the apparatus is very small, and has been found to be rather less than 13s. 4d. per 1,000 gals., taking coal at 20s. per ton. Where the treated water is to be used for boiler feed this cost is considerably reduced, and is in fact not appreciable. The softener will remove all the temporary hardness from the water as well as any organic matter whether suspended or in solution, and renders the most impure waters perfectly fit for boiler use or for drinking purposes. The apparatus is very largely employed by boiler users, hospitals, infirmaries, &c., especially in the chalk districts of England, where the water is extremely bad for boiler purposes.

New Theatre Regulations.—In the new theatre regulations of the London County Council the rule remains that two exits shall be provided for every tier or floor, with an additional exit in respect of every 250 persons (or part of 250 persons) above 500 for whom accommodation is provided; but for the first time "the standing space from which a view of the performances can be obtained, as well as the seated area, will be considered." The holding capacity of most theatres is 50 per cent. higher—and of some 100 per cent. higher—than the seating accommodation; thus the new regulations will result in future theatres having many more exits that existing theatres.

Keystones.

A New Mission Room at Mayor's Walk, Peterborough, has been built from designs by Mr. Ruddle. Mr. F. Nichols was the builder.

Towards the Cost of Extending Oldham Infirmary, by the erection of an additional wing to accommodate twelve beds, the sum of £13,134 has been received up to the present. £18,000 is needed.

New Race Stands on the Newton Course (Plymouth) have been erected by Mr. J. Edwards, contractor, of Newton. Each has a frontage of about 100ft., and they will accommodate nearly 3,000 persons.

The death of Mr. John Wild, J.P., which took place on August 8th at Alderley Edge, Manchester, has removed a prominent figure from Oldham business circles. Mr. Wild, who was in his sixty-sixth year, was the senior partner in the firm of Wild, Collins & Wild, architects, and executed a good deal of work of note in the borough; the firm are now completing the building of St. Peter's new church.

An Historic Estate.—Toddington, Gloucestershire, comprising about 7,000 acres, and a mansion that cost £150,000, has been sold to Mr. Hugh Andrews, the high sheriff of Northumberland. The property is rich in historical associations. The ruins of the ancient Abbey of Hailes are upon it, and it was here that Richard, Earl of Cornwall, founded a Cistercian monastery in 1246.

The New Church House at Furnham, Yeovil, was opened recently. The ground-floor room is now capable of providing seating accommodation for 400 persons. On the first floor there are three lofty and well-ventilated classrooms, approached by steps from the outside. The cost of the alterations has been about £500. Mr. A. W. Yeomans, the vicar's warden, was the architect, and Messrs. Harris & Woolcott were the builders.

Fourteenth-Century Doorways found at Broughton Castle.—In the great hall of Broughton Castle, near Banbury, the plaster having been removed from the walls, five or six early fourteenth-century doorways, which have been blocked up since 1554, have been discovered, and also some very fine windows of the same period, one of them still showing a portion of the tracery. Mr. Purdon Clarke, of the Victoria and Albert Museum, has been to the Castle to give his opinion with regard to the discoveries.

New Market at Douglas.—A new market for fish, butter and vegetables has been built on the site of the old St. Matthew's Church and the former open-air market on the North Quay, Douglas, I.M. It is constructed entirely of iron and measures 115ft. 6in. by 43ft. 6in. at one side and 91ft. by 37ft. 6in. at the other side, with a height of 12ft. to the underside of the ornamental steel girders. The roof has iron principals and wood purlins, covered with ¼in. boards felted and slated with best Welsh slates. The fish and vegetable markets are separated by a brick wall running the full height of the building. Lavatories are provided, and a boiler-house enables hot water to be obtained at any time for washing the stalls and fittings. The cost of the building has been £3,000, but another £300 has been spent on the stalls. In the fish market the stalls are of white marble on white brick piers, and they are 7ft. long by 4ft. wide. Arrangements have also been made for carrying away the water after washing the fish on the stalls. The stalls in the vegetable and fruit market are built of wood. They are between 7ft. and 9ft. long and 4ft. wide, and are provided with movable shelves on which the fruit can be displayed to the best advantage. The ironwork is of an ornamental character, the pediments to the main roofs having the borough coat of arms in the centre of each, picked out in gold relief. The plans were prepared by Mr. A. E. Prescott, borough surveyor; and the contractor for the entire work was Mr. F. Callow. The ironwork was supplied by Messrs. McFarlane & Co., of Glasgow. The plumbing and gasfitting was executed by Messrs. George Sherwood & Co.

A Statue of Leopold I. has been erected at Ostend.

Chester's New Public Baths are to be opened this month.

New Station Buildings at Lugton, Glasgow, have been erected by Mr. William Duncan, of Pollokshaws.

The Museum of Practical Geology in Jermyn Street has been closed as usual from Friday evening last until September 10th.

The Children's Ward at Chester Infirmary has been renovated in memory of Miss Frances Barrow, the late superintendent.

Mr. Oliver Sheppard, sculptor, has been elected a constituent member of the Royal Hibernian Academy.

The Contract for the New Victoria Infirmary at Newcastle has been signed, and work will be commenced at once. Mr. Pringle is the contractor.

The Embankment Seats are proposed to be raised 1½ft. on stone slabs approached by a couple of steps in order to command a better view of the Thames.

The Church of St. Margaret, Burnage, near Manchester, which was only erected in 1875, is already being enlarged. A north aisle is being added at a cost of £1,000, and extensions are contemplated at the west end and other portions of the buildings.

Proposed War Memorial in Somerset House.—A committee is being formed representative of all branches of the Inland Revenue with the object of placing a memorial tablet in Somerset House to the memory of Sergeant Arthur Hoskins, of the Devon Company Imperial Yeomanry, who was killed at Vlakfontein. Somerset House is a royal building, but it is not thought the First Commissioner of Works will impose any obstacle in the way.

A Victoria Memorial for Newport, I.W.—It has been decided that a monument shall be erected in the market square at Newport as the island's memorial to the late Queen Victoria. The subscriptions approach £1,000. The designs for the memorial are to be submitted for the approval of Princess Henry of Battenberg, as Royal Governor of the island; and the suggested designs include an enlarged replica of the bronze bust of her late Majesty in the Royal Academy, which Mr. Thomas Brock, R.A., is prepared to execute.

Decorative Art Exhibition in Turin.—The first international exhibition of modern decorative art will be held in Turin next spring under the patronage of the King of Italy, and with the co-operation of societies and individual artists throughout the world. Mr. Walter Crane has accepted the office of English commissary, and promises to the general committee a collection of the best works of contemporary British artists, together with a retrospective exhibit of the origins of the new style. As regards Scotland, Mr. Francis Newbery promises the contribution of the "quaint, hardy and characteristic school of Glasgow decorative artists." Other nations represented will be France, Belgium, Austria, Hungary, Russia, Denmark, Norway, Sweden, the United States and Japan. Further information may be obtained from the general committee of the exhibition in Turin.

The Victoria and Albert Museum.—In the House of Commons on Thursday last Mr. Akers-Douglas stated that the foundations of the Victoria and Albert Museum had been completed, and the contract was for £83,410. A second contract had been made for building to the ground-floor level, and this work is now being proceeded with. As soon as this is finished tenders will at once be invited for the superstructure, the plans being now practically ready. No alterations that he was aware of had been made which would reduce the size of the museum, and no delays of importance had occurred, the work being completed within the allotted time. The contract for the foundations was not entered into until some time after the laying of the memorial stone, that ceremony having taken place in advance to suit her late Majesty's arrangements.

A Memorial Window to the late Mr. D'Oyly Carte is to be placed in the Chapel Royal, Savoy.

A new Stained-Glass Window at Clun Church, Salop, has been erected from designs by Mr. T. F. Curtis, Soho Square, London, W.

The New Hospital at Newport (Mon.), on the Cardiff Road, was recently opened by Lord Tredegar. It has been designed by Mr. W. Tanner, county surveyor. Messrs. D. Richards, Ltd., of Newport, were the contractors.

The Bells of Exeter Cathedral.—The Chapter of Exeter Cathedral has decided to rehang the peal of eleven bells. It is stated that from £1,000 to £1,200 will be required for the work, but up to the present time only about half the amount has been subscribed.

New Shoe Factory at Stafford.—The Stafford Town Council has decided to lease 10¾ acres of land on the Coton Field estate, fronting Sandon Road, to a firm of shoe manufacturers at a chief rent of £17 an acre per year, the Council to construct a street in continuation of Oxford Street.

Pepys and St. Paul's.—The immortal Pepys wrote in his diary for September 16th, 1663: "I stopped, too, at St. Paul's, and there did go into St. Fayth's Church, and also in the body of the west part of the church, and did see a hideous sight of the walls of the church ready to fall, that I was in fear as long as I was in it."

The Art of Bridge-Building.—It is said that Canova, the sculptor, being asked while on a visit to England what had struck him most forcibly here, replied: "That the trumpery Chinese bridge, then in St. James's Park, should be the production of the Government, while that of Waterloo was the work of a private company."

Improvements to Armagh Cathedral.—The long contemplated improvements to Armagh Cathedral have now been commenced. A chancel window is to be erected in memory of members of the Beresford family, necessitating the raising of the chancel roof. The new roof will be of oak. Two new brasses will also be erected. The work is being carried out to the design and under the supervision of Sir Thomas Drew.

New Mission Hall at North Shields.—The foundation-stone of this building, in Northumberland Street, was laid last week. It will comprise a large mission hall, children's school, vestry, classrooms, &c. The main hall will seat about 350 persons, while the school will accommodate over 200 children. Mr. Thomas Robson, of Tynemouth, is the builder, and Messrs. Thomas A. Page & Son, South Shields, are the architects.

Frescoes in the Pantheon, Rome.—Ferdinand Humbert's fine frescoes are much admired by visitors to the Pantheon, but as they are not signed people are in doubt as to the painter's name. The other day a party of Cook's tourists were examining the frescoes, which the guide attributed to Puvis de Chavannes, and the magic of the name gave the works additional glory. The next globe-trotters who visit the Pantheon, however, will be able to find out for themselves the name of the artist, for since this incident Humbert has added his signature to the frescoes.

Labourers' Dwellings for Liverpool: Local Architects to submit Plans.—At the last meeting of Liverpool City Council the Housing Committee recommended the acceptance of a tender for the erection of 113 labourers' dwellings in Newsham Street, Kew Street and Arley Street, in accordance with plans, specifications and quantities prepared by the Corporation surveyor, for the sum of £20,689. Mr. Thomas Roberts moved an amendment that independent local architects be asked to submit plans, to ascertain if they could suggest a more efficient economical plan for the proposed houses. The amount of the present tender worked out at £70 19s. per room, or between 8d. and 9d. per cub. ft. Other builders could erect a similar class of houses for £25 10s. per room, which meant that the present scheme could be carried out for £8,030 instead of £20,689 which the committee proposed to pay. The amendment was carried.

New Companies.

Vulcanite, Ltd.

Registered July 19th to acquire and carry on the businesses of the Patent Vulcanite Roofing and Asphalte Co., Ltd., and the Logan Vale Fibre Syndicate, in Belfast and elsewhere in Ireland, and at Storn Road, Old Ford, near London. Capital £100,000 in 50,000 five per cent. preference shares and 50,000 ordinary shares of £1 each. Registered office: Logan Vale, Belfast.

Albert (Tenements) Co., Ltd.

Registered July 29th to acquire land and buildings in Dublin and its neighbourhood for the purpose of providing houses for the poor. Capital £10,000 in £1 shares. Registered office: 22, Nassau Street, Dublin.

Station Street Corner, Ltd.

Registered July 29th to acquire the assignment of a lease for the acquisition of certain land in Station Street and John Bright Street, Birmingham, and to carry on the business of builders, contractors, &c. Capital £4,000 in £100 shares. Registered office: 33, Newhall Street, Birmingham.

Ridgill Brick Co., Ltd.

Registered July 30th to adopt an agreement with W. Ridgill, and to carry on the business of brick, tile, drain pipe, &c., merchants. Capital £3,000 in £1 shares. Registered office: 18, Sandygate, Wath-on-Dearne, near Rotherham.

F. B. Thackray & Co., Ltd.

Registered July 31st to acquire the business of a builder and contractor carried on by F. B. Thackray at Huntingdon, and to carry on the same. Capital £10,000 in £10 shares. Registered office: 5, Ermine Street, Huntingdon.

Milton and Barton Court, Ltd.

Registered August 1st to acquire certain land and buildings at Barton-on-Sea, and to carry on the business of land and property owners, builders, &c. Capital £3,000 in £1 shares.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	BUILDING:		
Aug. 16	Low Fields, Ingleton—Residence Stables, &c.	Mr. William Taylor	S. Shaw, Architect, Highgate, Kendal.
„ 16	Chittlehamholt, Devon—Enlarging	W. R. Moore	High Bullen Farm, Chittlehamholt, North Devon.
„ 16	Enniskillen—Improvements	—	T. Elliott, 37 Darling Street, Enniskillen.
„ 16	Ingleton, near Kendal—Residence, &c.	W. Taylor	S. Shaw, Architect, Highgate, Kendal.
„ 16	Londonderry—Houses	Most Rev. Dr. O'Doherty	E. J. Toye, Architect, Strand, Londonderry.
„ 16	Spittal, near Berwick-on-Tweed—Additions	—	W. Gray, 2 Ivy Place, Berwick-on-Tweed.
„ 17	Walton-on-Thames—Stables, &c.	Urban District Council	C. J. Jenkin, Engr. & Surveyor, Council Offices, Walton-on-Thames.
„ 17	Wroughton, Wilts—Rebuilding	H. Horsell	Three Horseshoes Inn, Wroughton.
„ 17	Neath, Wales—Gymnasium	Governors of the County School	D. M. Jenkins, Architect, Gwyn Hall, Neath.
„ 17	Hunslett, Leeds—Alterations, &c.	Guardians of Union	W. E. Richardson, Architect, Rothwell.
„ 17	Hoyland, near Barnsley—Alterations	School Board	W. J. Sykes, Architect, Hoyland Nether.
„ 17	Dewsbury—Bricks, &c.	Corporation	H. Dearden, Borough and Water Engineer, Town Hall, Dewsbury.
„ 19	Pembroke Dock—School	School Board	G. Morgan & Son, 24 King Street, Carmarthen.
„ 19	Whitchurch, near Cardiff—School	School Board	R. & S. Williams, Borough Chambers, Wharton Street, Cardiff.
„ 19	West Didsbury, Lancs—Caretaker's House	—	J. Cartwright, Peel Chambers, Market Place, Bury.
„ 19	Brimscombe, Glos—Mission Room	—	G. P. Milnes, Town Hall, Stroud.
„ 19	Holywell Green, near Halifax—Conveniences	—	W. C. Williams, 29 Southgate, Halifax.
„ 19	Southampton—Cover over Sale Ring	Corporation	W. B. G. Bennett, Borough Engineer, Southampton.
„ 19	Blackburn—Reconstruction of Privies, &c.	Health Committee	W. Stubbs, Borough & Water Engnr., Municipal Offices, Blackburn.
„ 20	Stonehaven, Kincardine, N.B.—Hospital	County Council	Brown & Watt, 17 Union Terrace, Aberdeen.
„ 20	Bristol—Disinfecting Station	Health Committee	T. H. Yabbicom, 63 Queen Square, Bristol.
„ 20	London, E.—Additions, &c., Bakehouse	London County Council	Architect's Department. Housing of the Working Classes Branch 18 Pall Mall East, S.W.
„ 20	Hoyland—Primitive Methodist Chapel	Trustees	W. J. Sykes, Architect, Hoyland N. Barnsley.
„ 21	Rochester—Shelter	Corporation	W. Banks, City Surveyor, Guildhall, Rochester.
„ 21	Batley—Buildings	Corporation	J. C. Barraclough, Waterworks Engineer. Market Place, Batley.
„ 21	Darfield, Yorks—Houses, &c.	T. Wilkinson	A. B. Linford, Architect, Carlton Villa, Wombwell.
„ 21	Porth, Wales—Extensions	—	W. H. Childs, 69 Cymmer Road, Porth
„ 22	Stratford upon-Avon—Lodge, &c.	Joint Hospitals Committee	R. Dixon, Municipal Offices, Sheep Street, Stratford-upon-Avon.
„ 22	Longton, Staffs—Alterations	School Board	J. H. Beckett, Stafford Street, Longton.
„ 22	London, S.W.—Cottage Homes	Guardians of Wandsworth Union	C. A. Sharp, 11 Old Queen Street, Queen Anne's Gate, S.W.
„ 22	Aughton, Lancs—Pavilion	Rural District Council	W. Rawcliffe & J. A. Seward, Architects, Fishergate, Preston.
„ 22	Bristol—Coroner's Court, Mortuary, &c.	Sanitary Committee	T. H. Gabbicom, 63 Queen Square, Bristol.
„ 23	London, S.E.—Dwellings	London County Council	Architect's Department, Housing of the Working Classes Branch, 18 Pall Mall, S.W.
„ 23	Luton—Fire Station, &c.	Town Council	Borough Surveyor's Office, Town Hall, Luton.
„ 24	Nelson—Central Station	Electricity and Tramways Committee	B. Ball, Borough Engineer and Surveyor, Nelson.
„ 24	Walsall—Town Hall	Corporation	R. H. Middleton, Borough Engineer, Walsall.
„ 24	Mynachlogddu, Wales—Schoolroom	School Board	W. J. Williams, 1 High Street, Cardigan.
„ 26	Ilford—Buildings	Urban District Council	H. Shaw, 7 Cranbrook Road, Ilford.
„ 27	Sturminster—Infirmary	Guardians of Union	C. Hunt, Architect, The Close, Blandford.
„ 27	Truro—Cattle Market	City Council	M. Lea, City Engineer and Surveyor, Truro.
„ 27	Birkenhead—Mortuary	Corporation	C. Brownridge, Borough Engnr. & Surveyor, Town Hall, Birkenhead
„ 27	Warwick—Mortuary	Town Council	Borough Surveyor's Offices, Warwick.
„ 28	Leavesden, near Watford—Alterations	Metropolitan Asylums Board	Newman & Newman, 31 Tooley Street, London Bridge, S.E.
„ 28	Rustington, Sussex—Seaside Homes	Metropolitan Asylums Board	R. Plumbe, 13 Fitzroy Square, W.
„ 28	Norwich—Alterations and Additions	Guardians of Poor	J. B. Pearce, Surveyor, Upper King Street, Norwich.
„ 29	Reading—Swimming Bath, &c.	Corporation	J. Bowen, Borough Engineer and Surveyor, Town Hall, Reading.
„ 30	Denbigh—Additions to Asylum	Committee of Visitors	T. M. Lockwood & Sons, Foregate Street, Chester.
„ 31	Whitley, Northumberland—Police Station, &c.	—	J. Cresswell, County Architect, Moothall, Newcastle-on-Tyne.
Sept. 2	Middlesbrough—Asylum Extensions	Visiting Committee	A. Sockett, Clerk to the Committee, Municipal B'dgs., Middlesbrough.
„ 3	Boston, Lincs—Cookery Centre, &c.	School Board	J. Rowell, Borough Surveyor's Office, Market Place, Boston.
„ 4	Leeds—Hospital Extensions	Sanitary Committee	Clerk of Works Office, Seacroft Hospital.
„ 5	Holyhead—School	—	J. Owen, Menai Bridge.
„ 9	War Department Contracts (Aldershot)—Repairs and Materials.	—	Sub-District Commanding Engineer, South Aldershot, R.E. Office.
„ 16	London, W.—Mortuary Buildings and Chapel	Paddington Borough Council	Surveyor, Town Hall, Paddington, W.

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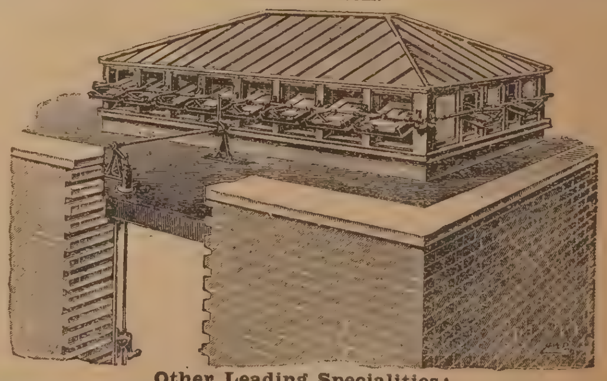

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COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
		ENGINEERING:		
Aug.	16	Jassy—Supply of Water to Town	Communal Council	Communal Technical Department, Jassy.
"	17	Doncaster—Cables, &c.	Corporation	C. A L. Prussmann, Electricity Works, Grey Friars Rd., Doncaster.
"	17	Manchester—Electrical Accessories	Tramways Committee	J. M. M'Elroy, Tramways Department, 55 Piccadilly, Manchester.
"	20	Sligo—Boiling Pans	District Asylum	Resident Medical Superintendent, District Asylum, Sligo.
"	20	Brighton—Electric Light Installation	Guardians	B. Burfield, Parochial Offices, Prince's Street, Brighton.
"	21	London, E.C.—Goods Engine	East Indian Railway Company	C. W. Young, Secretary, Nicholas Lane, E.C.
"	21	Liverpool—Widening, &c.	S. Lancs Electric Traction and Power Company, Ltd.	Kincaid, Waller & Manville, 29 Gt. George St., Westminster, S.W.
"	21	London, E.C.—Goods Engine	East Indian Railway Company	C. W. Young, Secretary, Nicholas Lane, London, E.C.
"	22	Darlington—Electric Lighting Plant	Corporation	H. G. Steavenson, Town Clerk, Town Clerk's Office, Darlington.
"	23	Worcester—Electrical Plant	Corporation	C. J. Sutherland, City Electrical Engineer, Guildhall, Worcester.
"	24	Parcgwyllt, near Bridgend—Electric Lighting	—	H. W. Davies, Clerk of Asylums, Bridgend.
"	26	Fenny Stratford—Sewage Disposal Works	Urban District Council	J. Chadwick, Engineer, Bletchley, Bucks.
"	26	Warlingham, Surrey—Electric Lighting	Croydon Town Council	Borough Engineer's Office, Town Hall, Croydon.
"	26	Newmarket—Water Supply	Rural District Council	S. J. Ennion, Clerk to the Council, Newmarket.
"	27	Farnham—Electricity	Urban District Council	R. Mason, Clerk to the Council, Farnham.
"	28	Dartford, Kent—Boilers, &c.	Metropolitan Asylums Board	A. & C. Harston, 15 Leadenhall Street, E.C.
"	29	Dartford—Repairing of Dolphins	Metropolitan Asylums Board	Offices of the Board, Embankment, E.C.
"	29	Bournemouth—Boilers, &c.	Corporation Tramways	F. W. Lacey, Borough Engineer, Municipal Offices, Bournemouth.
"	31	Ilford—Tramways	Urban District Council	J. W. Benton, Clerk, Council Offices, Ilford.
Sept.	2	Amsterdam—Electrical Tram Carriages and Rails	Municipality	Director of the Municipal Tramways, Nieuwe Achtergracht No. 164, Amsterdam.
"	3	Middlesbrough—Coal-Handling Plant	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, S.W.
"	5	Mansfield—Refuse Destructors	Electric Lighting Committee	R. Hammond, 64 Victoria Street, Westminster, London, S.W.
"	25	Havana—Sewerage System, &c.	Mayor of Havana	Lieutenant W. J. Barden, Chief Engineer, City of Havana.
Oct.	1	Copenhagen—Bridge	—	Statsbaneaulaegenes Kontor, Reventlowsgade, 10 Copenhagen, B.
"	1	Hadsun, Denmark—Bridge	Danish Ministry for Public Works	Statsbaneaulaegenes Kontor, Reventlowsgade, 10 Copenhagen, B.
Dec.	10	Rosario—Port Works	Government of Brazil	Government Offices, Buenos Ayres, Brazil.
"	31	Calcutta—Incinerators	Corporation	F. Gainsford, Secretary to the Calcutta Corporation, Calcutta.
Feb.	28	Sydney, N.S.W.—Bridge	Government of N.S.W.	Under Secretary for Public Works, Sydney.
		IRON AND STEEL:		
Aug.	16	London, N.E.—Fencing	Hackney Borough Council	N. Scorgie, Surveyor's Office, Town Hall, Mare Street, Hackney.
"	16	London, S.E.—Iron Tubes, &c.	Urban District Council	H. D. Longdin, Surveyor, Town Hall, Anerley, S.E.
"	17	Dewsbury—Iron and Steel, &c.	Corporation	H. Dearden, Borough and Water Engineer, Town Hall, Dewsbury.
"	21	Portsmouth—Iron, &c.	Corporation	Town Hall, Portsmouth.
"	21	Portsmouth—Ironmongery	Corporation	A. Hellard, Town Clerk, Town Hall, Portsmouth.
"	28	Rickmansworth—Pipes, &c.	Urban District Council	W. H. Radford, Engineer, Albion Chambers, Nottingham.

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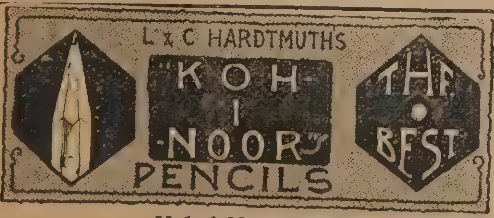

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COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
	PAINTING AND PLUMBING:		
Aug. 16	Guildford—Painting	Guardians	Workhouse Master, Guildford.
„ 17	Dewsbury—Paints, &c.	Corporation	H. Dearden, Borough and Water Engineer, Town Hall, Dewsbury.
„ 20	Ugborough—Painting	School Board	J. Smerdon, Attendance Officer, Ugborough.
„ 21	Portsmouth—Paints, &c.	Corporation	Town Hall, Portsmouth.
„ 22	Manchester—Painting	Parks, &c. Committee	City Surveyor, Town Hall, Manchester.
„ 26	Morley, Yorks—Painting, &c.	General Purposes Committee	W. E. Putnam, Borough Engineer & Surveyor, Town Hall, Morley.
„ 27	Chorlton—Outside Painting	Guardians of Union	Pater, Union Offices, All Saints', Manchester.
	ROADS AND CARTAGE:		
Aug. 16	Worcester—Watering Cart	Corporation	City Engineer's Office, Guildhall, Worcester.
„ 17	Dewsbury—Granite Setts, &c.	Corporation	H. Dearden, Borough and Water Engineer, Town Hall, Dewsbury.
„ 19	Woodford, Essex—Steam Rolling, &c.	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green.
„ 19	Coventry—Street Works	Corporation	J. E. Swindlehurst, City Engr. & Surveyor, St. Mary's Hall, Coventry.
„ 19	Garston, Lancs—Materials	Urban District Council	District Surveyor, Public Offices, Grassendale, West Liverpool.
„ 20	Leigh-on-Sea, Essex—Making-up	Urban District Council	F. E. Smee, 12 West Smithfield, E.C.
„ 21	South Mims—Granite, &c.	Rural District Council	G. D. Byfield, 16 High Street, Barnet.
„ 21	Portsmouth—Gravel, Sand, &c.	Corporation	Town Hall, Portsmouth.
„ 27	Withington, Lancs—Street Works	Urban District Council	A. H. Mountain, Surveyor to the Council, Town Hall, Withington.
„ 30	Walthamstow—Private Street Works	Urban District Council	G. W. Holmes, Engineer to the Council, Town Hall, Walthamstow.
„ 31	Bromley, Kent—Materials	Rural District Council	E. Hazlehurst, 98 High Street, Bromley, Kent.
Sept. 10	Barking, Essex—Street Works	Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking.
	SANITARY:		
Aug. 17	Dewsbury—Manhole, Cement, &c.	Corporation	H. Dearden, Borough and Water Engineer, Town Hall, Dewsbury.
„ 19	Spennymoor—Sewerage Works	Urban District Council	W. Curry, Silver Street, Spennymoor.
„ 20	Truro—Repairing Drains	Guardians of Union	Master of Workhouse, Truro.
„ 21	Glasgow—Sewer	Corporation	City Engineer, City Chambers, 64 Cochrane Street, Glasgow.
„ 21	Portsmouth—Cement	Corporation	Town Hall, Portsmouth.
„ 23	Rotherham—Sewers, &c.	Works Committee	R. E. W. Barrington, Bank Buildings, Wolverhampton.
„ 28	Rickmansworth—Sewerage Works	Urban District Council	W. H. Radford, Albion Chambers, Nottingham.
Sept. 2	Cleland and Omoa, Scotland—Sewer Works	District Committee of Middle Ward	W. L. Douglass, 3 Clydesdale Street, Hamilton.
	TIMBER:		
Aug. 17	Dewsbury—Timber	Corporation	H. Dearden, Borough and Water Engineer, Town Hall, Dewsbury.
„ 21	Strood, Kent—Firewood	Guardians of the Union	G. W. Pratt, Clerk, Strood, Rochester.
„ 21	Portsmouth—Timber	Corporation	Town Hall, Portsmouth.
Sept. 3	Cristiania—Wood	——	Arms Factory, Kongsberg.

COMPETITIONS OPEN.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Aug. 31	Sheffield—Alteration of Ecclesall Church	——	Rev. T. Houghton, Ecclesall Vicarage, Sheffield.
Sept. 16	Blackpool—Laying-out Land	£30, £15 and £5	Borough Surveyor, Town Hall, Blackpool.
Oct. 1	Chelsea—Public Baths	£105, £52 10s. and £31 10s.	Borough Council Offices, 171 King's Road, Chelsea.
„ 29	London, S.E.—Baths and Washhouses	150, 75 and 50 guineas respectively.	Town Clerk, Town Hall, Camberwell, S.E.

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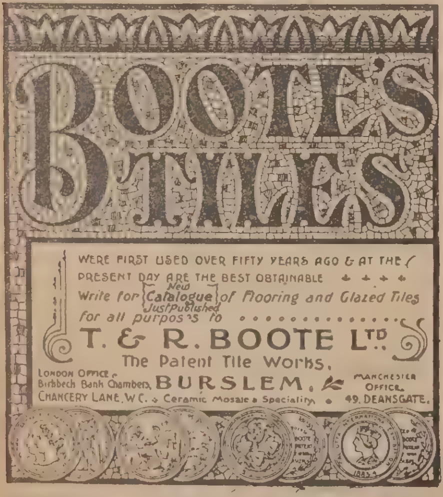

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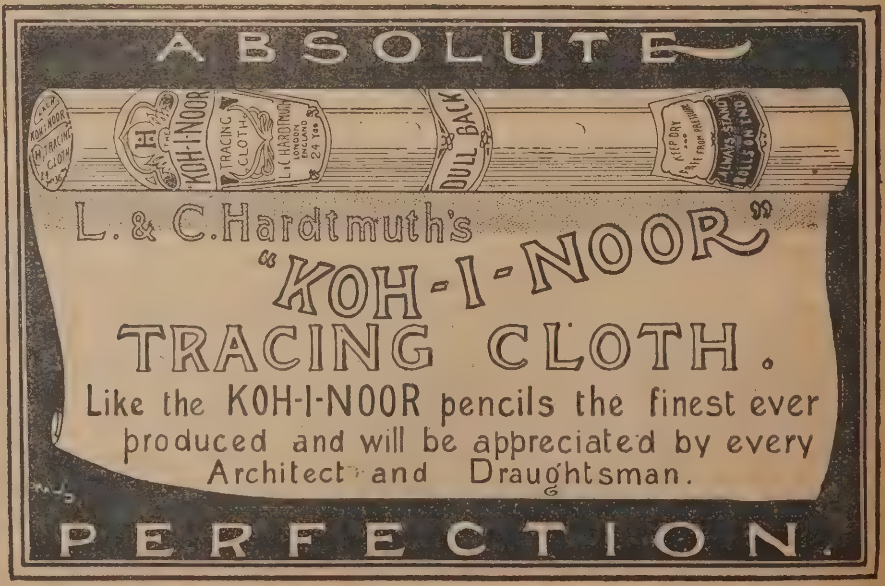

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